Te Kaunihera o Te Hiku o te Ika
Far North District Council

Office Use Only
Application Number:

Application for resource consent or fast-track resource consent

(Or Associated Consent Pursuant to the Resource Management Act 1991 (RMA)) (If applying for a Resource Consent pursuant to Section 87AAC or 88 of the RMA, this form can be used to satisfy the requirements of Form 9). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — both available on the Council's web page.

1. Pre-Lodgement Meeting

Have you met with a council Resource Consent representative to discuss this application prior to lodgement?

☑ **Yes** ☐ **No**

If yes, who have you spoken with? Nick Williamson

2. Type of consent being applied for

(more than one circle can be ticked):

☑ **Land Use**
☐ **Fast Track Land Use***
☐ **Subdivision**
☑ **Consent under National Environmental Standard**
(e.g. Assessing and Managing Contaminants in Soil)
☑ **Other (please specify)** Adaptive Consent Process / Pathway

☐ **Discharge**
☐ **Change of Consent Notice (s.221(3))**
☐ **Extension of time (s.125)**

**The fast track is for simple land use consents and is restricted to consents with a controlled activity status.*

3. Would you like to opt out of the fast track process?

☐ **Yes** ☑ **No**

4. Consultation

Have you consulted with Iwi/Hapū? ☑ **Yes** ☐ **No**

If yes, which groups have you consulted with?

Who else have you consulted with?

*For any questions or information regarding iwi/hapū consultation, please contact Te Hono at Far North District Council, **tehonosupport@fndc.govt.nz***

5. Applicant details

Name/s: The Proprietors of Tapuetahi

Email:

Phone number:

Postal address:
(or alternative method of service under section 352 of the act)

Have you been the subject of abatement notices, enforcement orders, infringement notices and/or convictions under the Resource Management Act 1991? ◯ **Yes** ✔ **No**

If yes, please provide details.

6. Address for correspondence

Name and address for service and correspondence (if using an Agent write their details here)

Name/s: Bay of Islands Planning - Steven Sanson

Email:

Phone number:

Postal address:
(or alternative method of service under section 352 of the act)

All correspondence will be sent by email in the first instance. Please advise us if you would prefer an alternative means of communication.

7. Details of property owner/s and occupier/s

Name and Address of the owner/occupiers of the land to which this application relates (where there are multiple owners or occupiers please list on a separate sheet if required)

Name/s: The Proprietors of Tapuetahi

Property address/
location:

Postcode

8. Application site details

Location and/or property street address of the proposed activity:

Name/s: The Proprietors of Tapuetahi

Site address/ location: 1009 Purerua Road, Te Tii

Postcode

Legal description: Lot 2-3 DP 176907, Lot 5 DP 17 **Val Number:**

Certificate of title: NA112A/909

Please remember to attach a copy of your Certificate of Title to the application, along with relevant consent notices and/or easements and encumbrances (search copy must be less than 6 months old)

Site visit requirements:

Is there a locked gate or security system restricting access by Council staff? ☑ **Yes** ○ **No**

Is there a dog on the property? ○ **Yes** ☑ **No**

Please provide details of any other entry restrictions that Council staff should be aware of, e.g. health and safety, caretaker's details. This is important to avoid a wasted trip and having to re-arrange a second visit.

Please call / email applicant or aagent for gate code.

9. Description of the proposal

Please enter a brief description of the proposal here. Please refer to Chapter 4 of the *District Plan, and Guidance Notes*, for further details of information requirements.

A resource consent application for 20 lots, with assocaited residential use and a boat storage area.

If this is an application for a Change or Cancellation of Consent Notice conditions (s.221(3)), please quote relevant existing Resource Consents and Consent Notice identifiers and provide details of the change(s), with reasons for requesting them.

10. Would you like to request public notification?

○ **Yes** ☑ **No**

11. Other consent required/being applied for under different legislation

(more than one circle can be ticked):

○ **Building Consent** Enter BC ref # here (if known)

☑ **Regional Council Consent (ref # if known)** Ref # here (if known)

○ **National Environmental Standard Consent** Consent here (if known)

○ **Other (please specify)** Specify 'other' here

12. National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health:

The site and proposal may be subject to the above NES. In order to determine whether regard needs to be had to the NES please answer the following:

Is the piece of land currently being used or has it historically ever been used for an activity or industry on the Hazardous Industries and Activities List (HAIL)? ◯ **Yes** ☑ **No** ◯ **Don't know**

Is the proposed activity an activity covered by the NES? Please tick if any of the following apply to your proposal, as the NESCS may apply as a result? ☑ **Yes** ◯ **No** ◯ **Don't know**

☑ **Subdividing land**

◯ **Changing the use of a piece of land**

◯ **Disturbing, removing or sampling soil**

◯ **Removing or replacing a fuel storage system**

13. Assessment of environmental effects:

Every application for resource consent must be accompanied by an Assessment of Environmental Effects (AEE). This is a requirement of Schedule 4 of the Resource Management Act 1991 and an application can be rejected if an adequate AEE is not provided. The information in an AEE must be specified in sufficient detail to satisfy the purpose for which it is required. Your AEE may include additional information such as written approvals from adjoining property owners, or affected parties.

Your AEE is attached to this application ☑ **Yes**

14. Draft conditions:

Do you wish to see the draft conditions prior to the release of the resource consent decision? ☑ **Yes** ◯ **No**

If yes, please be advised that the timeframe will be suspended for 5 working days as per s107G of the RMA to enable consideration for the draft conditions.

15. Billing Details:

This identifies the person or entity that will be responsible for paying any invoices or receiving any refunds associated with processing this resource consent. Please also refer to Council's Fees and Charges Schedule.

Name/s: (please write in full)	Mariao Hohaia
Email:	
Phone number:	
Postal address: (or alternative method of service under section 352 of the act)	

Fees Information

An instalment fee for processing this application is payable at the time of lodgement and must accompany your application in order for it to be lodged. Please note that if the instalment fee is insufficient to cover the actual and reasonable costs of work undertaken to process the application you will be required to pay any additional costs. Invoiced amounts are payable by the 20th of the month following invoice date. You may also be required to make additional payments if your application requires notification.

15. Billing details continued...

Declaration concerning Payment of Fees

I/we understand that the Council may charge me/us for all costs actually and reasonably incurred in processing this application. Subject to my/our rights under Sections 357B and 358 of the RMA, to object to any costs, I/we undertake to pay all and future processing costs incurred by the Council. Without limiting the Far North District Council's legal rights if any steps (including the use of debt collection agencies) are necessary to recover unpaid processing costs I/we agree to pay all costs of recovering those processing costs. If this application is made on behalf of a trust (private or family), a society (incorporated or unincorporated) or a company in signing this application I/we are binding the trust, society or company to pay all the above costs and guaranteeing to pay all the above costs in my/our personal capacity.

Name: (please write in full) Mariao Hohaia

Signature:
(signature of bill payer)

Date 31-Mar-2026

16. Important Information:

Note to applicant

You must include all information required by this form. The information must be specified in sufficient detail to satisfy the purpose for which it is required.

You may apply for 2 or more resource consents that are needed for the same activity on the same form.

You must pay the charge payable to the consent authority for the resource consent application under the Resource Management Act 1991.

Fast-track application

Under the fast-track resource consent process, notice of the decision must be given within 10 working days after the date the application was first lodged with the authority, unless the applicant opts out of that process at the time of lodgement.

A fast-track application may cease to be a fast-track application under section 87AAC(2) of the RMA.

Privacy Information:

Once this application is lodged with the Council it becomes public information. Please advise Council if there is sensitive information in the proposal. The information you have provided on this form is required so that your application for consent pursuant to the Resource Management Act 1991 can be processed under that Act. The information will be stored on a public register and held by the Far North District Council. The details of your application may also be made available to the public on the Council's website, www.fndc.govt.nz. These details are collected to inform the general public and community groups about all consents which have been issued through the Far North District Council.

17. Declaration

The information I have supplied with this application is true and complete to the best of my knowledge.

Name (please write in full)

Signature

Date

A signature is not required if the application is made by electronic means

See overleaf for a checklist of your information...

Checklist

Please tick if information is provided

- ◯ Payment (cheques payable to Far North District Council)
- ◯ A current Certificate of Title (Search Copy not more than 6 months old)
- ◯ Details of your consultation with Iwi and hapū
- ◯ Copies of any listed encumbrances, easements and/or consent notices relevant to the application
- ◯ Applicant / Agent / Property Owner / Bill Payer details provided
- ◯ Location of property and description of proposal
- ◯ Assessment of Environmental Effects
- ◯ Written Approvals / correspondence from consulted parties
- ◯ Reports from technical experts (if required)
- ◯ Copies of other relevant consents associated with this application
- ◯ Location and Site plans (land use) AND/OR
- ◯ Location and Scheme Plan (subdivision)
- ◯ Elevations / Floor plans
- ◯ Topographical / contour plans

Please refer to Chapter 4 of the District Plan for details of the information that must be provided with an application. Please also refer to the RC Checklist available on the Council's website. This contains more helpful hints as to what information needs to be shown on plans.

Assessment of Environmental Effects

Application for Resource Consent:

Combined land use and subdivision consent for twenty dwellings and a storage yard area.

Prepared for:	Tapuaetahi Incorporation
By:	Steven Sanson | Consultant Planner
Date:	March 2026

1.0 APPLICANT & PROPERTY DETAILS

Applicant	Tapuaetahi Incorporation
Address for Service	Bay of Islands Planning Limited PO Box 318 PAIHIA 0247 C/O - Steven Sanson steve@bayplan.co.nz 021-160-6035
Legal Description	Lot 2-3 DP 176907, Lot 5 DP 177923 and Lot 1 DP 184896
Record Of Title	NA112A/909
Physical Address	1009 Purerua Road, Te Tii
Site Area	329.6124ha
Owner of the Site	The Proprietors of Tapuetahi
District Plan Zone	Coastal Living / General Coastal [ODP] Māori Purpose - Rural [PDP]
District Plan Features	Outstanding Natural Landscape [ODP & PDP] Coastal Environment [PDP] High Natural Character [PDP] Coastal and River Flooding [PDP]
Archaeology	Nil
NRC RPS Overlays	Coastal Environment High Natural Character
Soils	Class 4
Protected Natural Area	Tapuaetahi Shrubland P04/091
HAIL	Nil

2.0 SUMMARY OF PROPOSAL

Proposal	It is proposed to subdivide Lot 1 DP 184896 to create 20 residential allotments and create a boat storage area. Each of the 20 lots are intended to contain one dwelling with associated services / amenities. These are all supported within a defined building envelope. There are associated land use breaches and overall, the application is a Non-Complying Activity under the Operative District Plan. There are no breaches to the Proposed District Plan. Consents are required from the Northland Regional Council. A consent duration of 10 years is sought.
Reason for Application	The proposal requires consent for the following rule breaches: • 10.6.5.1.1 Visual Amenity - Discretionary • 10.7.5.1.1 Visual Amenity – Discretionary • 10.7.5.1.6 Stormwater Management – Discretionary • 12.3.6.1.2 Excavation and Filling in the Coastal Living and General Coastal Zone – Discretionary • 12.4.6.1.2 Fire Risk to Residential Units – Discretionary • 13.7.2 Minimum Lot Sizes in the Coastal Living Zone – Non Complying • 13.7.2 Minimum Lot Sizes in the General Coastal Zone – Restricted Discretionary • 15.1.6A.2.1 Traffic Movements – Discretionary • 15.1.6C.1.1 Private Access – Discretionary
Appendices	Appendix A – Record of Title & Instruments Appendix B – Site Plan Appendix C – Engineering Report & Plans Appendix D – Landscape Report & Plans Appendix E – Incorporation Documents
Consultation	Adaptive Consent Pathway

3.0 INTRODUCTION & PROPOSAL

3.1 Report Requirements

This report has been prepared for the Tapuaetahi Incorporation in support of a combined land use and subdivision consent application at 1009 Purerua Road, Te Tii.

Section 88 of the Resource Management Act 1991 [**RMA**] requires that every resource consent application shall be made in the prescribed form and manner and includes the information relating to the activity, including an assessment of the activity's effects on the environment, as required by Schedule 4.

Schedule 4 of the RMA outlines the matters which must be included within an application for resource consent, including:

a) a description of the activity:
b) a description of the site at which the activity is to occur:
c) the full name and address of each owner or occupier of the site:
d) a description of any other activities that are part of the proposal to which the application relates:
e) a description of any other resource consents required for the proposal to which the application relates:
f) an assessment of the activity against the matters set out in Part 2:
g) an assessment of the activity against any relevant provisions of a document referred to in section 104(1)(b).

Schedule 4 also defines additional matters to be included in an application for subdivision consent and the matters to be considered when preparing an assessment of effects on the environment.

These statutory requirements are addressed in the application.

3.2 Development Ethos

The proposal as lodged represents years of detailed consideration for the site seeking to balance a wide range of commercial, environment, cultural, and social aspects that the applicant must consider as a Māori Incorporation.

With the above in mind, the development approach has been collaborative in nature, utilising the adaptive planning approach recently offered by the Council.

This approach has enabled a constructive and robust process for the consideration of engineering detail. This application now seeks to promote a similar approach for the consideration of all potential effects through this planning application and associated appendices, which includes an overall landscape, visual amenity and natural character assessment.

Given the approach, the development is grounded in a sustainable management approach at a higher level, seeking to avoid effects where necessary through the overall design of the proposal and where this wasn't possible, promoting measures which will appropriately mitigate adverse effects.

At the coalface, the proposal has been developed on the ethos of the Operative District Plans [**ODP**] objectives and policies which encourage innovative development and integrated management of effects resulting in a superior outcome [i.e. the management plan approach].

This application is aligned with the spirit of the plan, although has various rule departures and nuances given the overall context within which development is proposed, namely that of a Māori Incorporation developing Māori Freehold land with all of the known challenges around finance, a differing land tenure system, and resource management processes.

Central to this ethos is the principle of Kaitiakitanga, which serves as one of the Incorporation's six core strategic strands.

The proposal is not a standalone development, but a physical extension of a 30-year aspirational vision and consecutive five-year strategic plans focused on the holistic restoration of the whenua and moana.

This commitment is already evidenced by the establishment of a Coastal Care Group, a multi-year weeding and planting programme for the Tapuaetahi sand spit using eco-sourced seeds, and the planting of 24,000 mānuka to protect coastal water quality.

By integrating these self-initiated environmental projects—such as waterway fencing, pest trapping in partnership with Kiwi Coast, and the retirement of forestry—

the development ensures that the applicant reflects the values of the shareholders and fulfills the mandate of the Ngāti Rēhia Hapu Environmental Management Plan.

Please refer to **Appendix E,** for a range of documents that showcase the intent and strategic outlook of the applicant. The information is clearly distinguishable from a typical 'developer'.

3.3 Description of Proposal

Appendix A provides the relevant Record of Title and associated instruments for the site where development is proposed.

The project proposes subdividing Lot 1 DP 184896 to create 20 new residential allotments. Each of the 20 proposed lots is intended to contain one dwelling with associated services and amenities. These are all supported within a defined building envelope.

Dwellings on each site will be a mix of single or two storey / stepped typologies, either at a 5m or 7m height limit. A 200m^2 – 255m^2 footprint for buildings is shown for each dwelling.

Single storey dwellings will be provided on Lots 1-3, 7-11, and 12-18. Two storey / stepped dwellings are provided for on Lots 4-6 and 19-20.

Figure 1 - Overall Site Plan [Source: Littoralis]

These residential allotments and associated services are contained within the Coastal Living Zone which has been measured as being ~11.5ha in size.

The remaining land (balance lot) will accommodate the internal accessways, part of the proposed communal onsite wastewater system, as well as a boat storage yard. These features are in the General Coastal Zone.

The boat storage yard contains 15 covered storage spaces and 8 uncovered storage spaces with a generous hardstand area. This yard will be fully fenced and only available to residents [i.e there will be no external users permitted or provided for]. The height of the storage buildings is 6m. They will be 580m^2 in size in total.

The wash down area will be 148m^2 in size and in include a 750l oil/grit interceptor for environmental protection. Seven 30,000l water tanks are provided for the storage area which include a dual tank 100mm Fire Service Outlet Kit.

From an access perspective, a new shared right of way will provide access to all new lots from Taronui Road. A walking track is proposed from the development area through to the bottom of Taronui Road near the coast where storage sheds for dinghies, kayaks and beach equipment are provided.

The development will use a decentralised, communal modified STEP (Septic Tank with Effluent Pump) system. Treated effluent will be pumped to shared land application areas. Given the scale of wastewater generated, the proposal requires resource consent for this aspect from NRC.

The proposal includes the formation of a stormwater attenuation pond (in the northeastern portion of the site), roadway culverts, and open swale drains to manage runoff.

From an earthworks perspective, the proposal involves a total cut volume of 7,036m^3 and a total fill volume of 4,143m^3, resulting in a net cut surplus of 2,893m^3. The total area to be worked is ~23,732m^2. This requires approval from both FNDC and NRC.

Physical works will be delivered in six distinct stages to optimise earthworks and infrastructure rollout as follows:

- Stage 1: Formation of Lots 1, 2, and 3, plus the initial roadway and wastewater infrastructure and southern / eastern framework planting.

- Stage 2: Lots 7, 8, 9, and 10.
- Stage 3: Lots 4, 5, 6, 11, 12, and 15, and the construction of the stormwater attenuation pond.
- Stage 4: Lots 13, 16, 17, 19, and 20.
- Stage 5: Lots 14 and 18.
- Stage 6: Final completion of the Boat Storage Yard Area.

Figure 2 - Staging Plan [Source: Littoralis]

The subdivision proposes allotments which range from 1,120m^2 to 2,585m^2

These allotment sizes are generally consistent with those required under the Coastal Living Zone.

The proposal is supported by various planting, fencing, and long-term pest and weed management. Planting proposed will be ~2.4ha.

Given the complexity associated with Māori land development and the large number of lots sought, a 10-year consent term is sought for both land use and subdivision components.

All details described above, can be viewed on the relevant plans provided in **Appendix B, C, D, and E**.

4.0 SITE & SURROUNDING ENVIRONMENT

4.1 Site & Development Area

The overall site is a large rural landholding situated in a coastal setting as outlined in Figure 3 below. It is located on the Purerua Peninsula and is covered in a mixture of pasture and regenerating vegetation.

The land is currently used for the farming of beef stock and includes agricultural infrastructure such as fences, races, and troughs.

The specific development area where works are proposed is further defined in plans provided in the appendices. In general, all works are proposed within the Coastal Living Zone and its immediate interface with the General Coastal Zone.

Figure 3 – Overall Site [Source: Prover]

4.2 Zoning & Resource Features

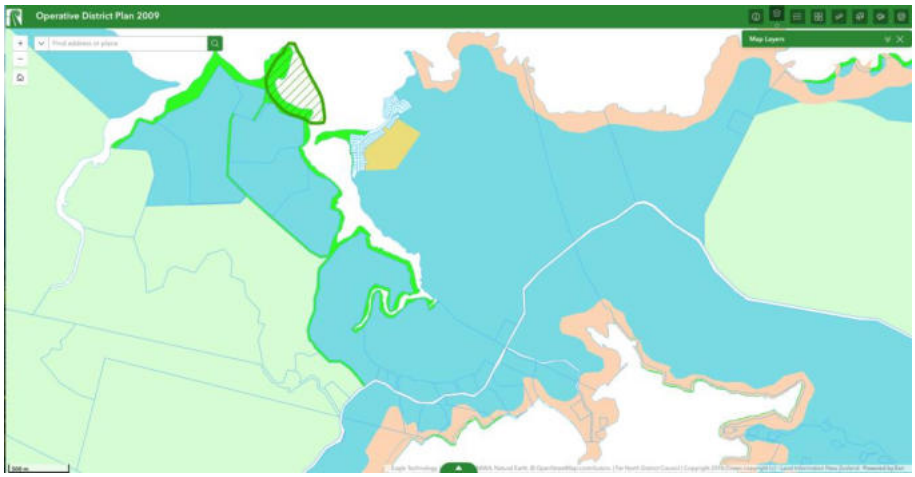


Figure 4 – ODP Zone Map [Source: Far North Maps]

The site is zoned General Coastal and Coastal Living Zone under the ODP and is proposed to be zoned Māori Purpose – Rural under the Proposed District Plan [PDP].

Under the ODP, some parts of site associated with coastal margins are considered to be an Outstanding Landscape. Under the PDP, this attribution is retained and the site is overlain by the Coastal Environment and includes vegetative areas considered to have High Natural Character.

The PDP also attributes the site as being subject to river and coastal flood hazards.

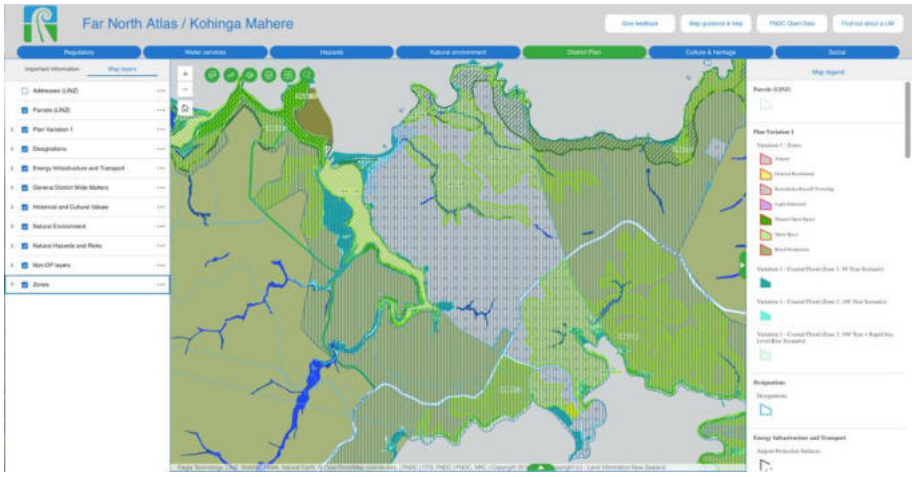


Figure 5 – PDP Zone Map [Source: Far North Maps]

4.3 Record of Title & Instruments

The Record of Title and relevant instruments are provided in **Appendix A**. There are no relevant features that arise on the title that promote any concerns for the proposed development. The Title confirms that the site is Māori Freehold Land.

4.4 Topography & Natural Features

The development area has a mixed topography which can be viewed in **Appendix B, C and D** where contours are provided on relevant plans. Similarly, an outline of natural features such as vegetation and water courses are present in these appendices.

As above, there are areas in vegetation which are considered to be of a high natural character and are also deemed to be Protected Natural Areas according to the Department of Conservation [Ref P04/091].

The site overall is in a 'Kiwi Present' area. The site has Class 4 soils which are not considered to be versatile.

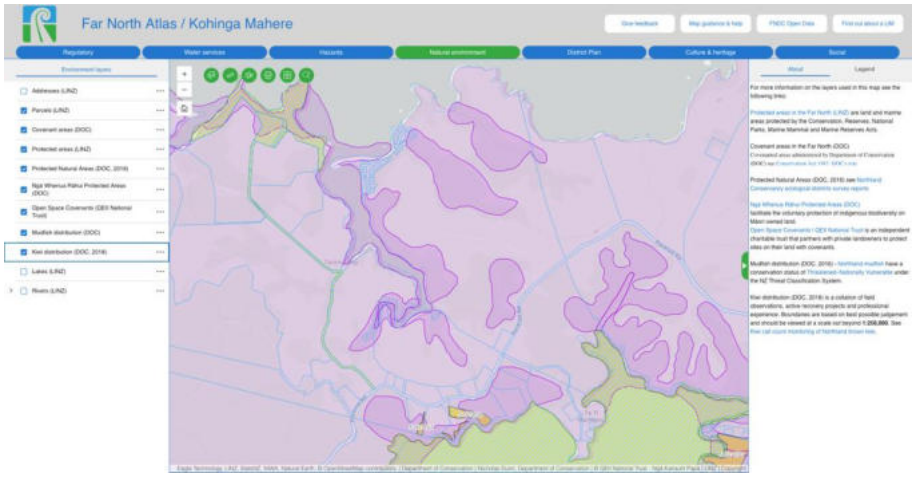


Figure 6 – Natural Features [Source: Far North Maps]

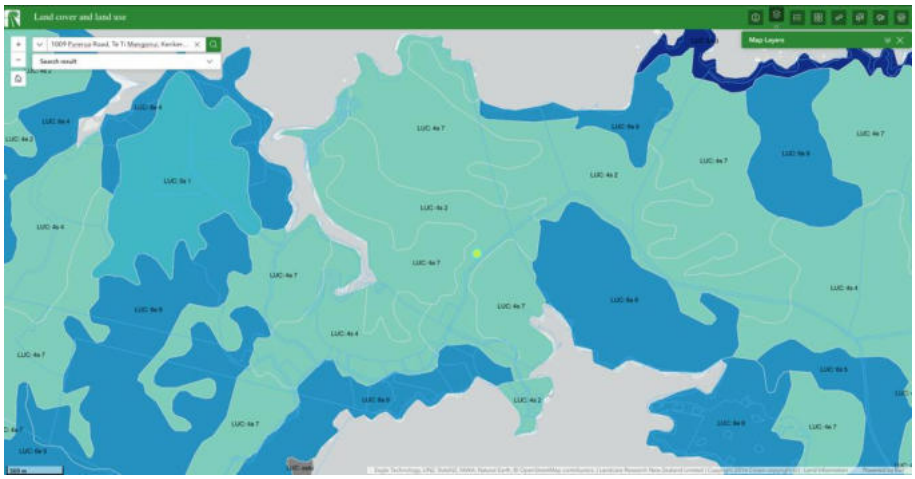


Figure 7 – Soils [Source: Far North Maps]

4.5 Built Form & Access

From a built form perspective, the site contains the applicant's office and various sheds which are located near the accessway from Purerua Road. There is no built development or access currently present at the development area, save for a Tsunami Siren.

Access to the site is via Taronui Road, which is a private roadway which connects the site and residential landholdings at Tapuaetahi Beach to Purerua Road. The development area is proposed to be serviced by internal roadways and crossings from Taronui Road. Public access is not provided or proposed.

4.6 Surrounding Environment

The site and development area adjoins residential development that is also owned and leased by the applicant. These landholdings are zoned as Coastal Residential under the ODP and are of an urban lot size and density.

The site is otherwise surrounded by landholdings which contain a mixture of pastured farmland, regenerating vegetation, and low density housing situated in a coastal setting.

5.0 ASSESSMENT OF RELEVANT RULES

5.1 Assessment of ODP Rules

An assessment of the relevant rules of the ODP is provided in the Tables below.

Table 1 – Coastal Living Zone Rule Assessment

Rule	Assessment	Status
10.7.5.1.1 Visual Amenity	All buildings proposed are greater than the rule which specifies 25m^2 for non-habitable use and 50m^2 for habitable use. There is no existing building envelopes approved for the proposed built form that will result.	Discretionary
10.7.5.1.2 Residential Intensity	The portion of the site zoned Coastal Living is 11.5ha. The permitted standard allows 1 dwelling per 4ha. 20 dwellings are proposed.	Permitted[1]
10.7.5.1.3 Scale of Activities	No non-residential activities are proposed.	Permitted
10.7.5.1.4 Building Height	All of the proposed buildings will have a height less than 8m.	Permitted
10.7.5.1.5 Sunlight	All dwellings located in the building envelope are expected to meet this rule.	Permitted
10.7.5.1.6 Stormwater Management	The proposal generates more than 10% / 600m^2 of stormwater and more than 15% / 4000m^2.	Discretionary
10.7.5.1.7 Setback from Boundaries	All dwellings located in the building envelope are expected to meet this rule.	Permitted
10.7.5.1.8 Screening for Neighbours	Not relevant.	Permitted
10.7.5.1.9 Transportation	Traffic:	Discretionary

[1] Assuming the subdivision application is approved, the density is therefore permitted.

	According to the District Plan, each dwelling will produce 10 traffic movements = 200 movements. The traffic report states that the proposal will generate 90 movements from the 20 dwellings. 90 movements results in a breach to 15.1.6A.2.1 which allows 20 movements as a permitted activity. Parking: Not relevant. Access: Rule 15.1.6C.1.1[a], [c] and [d] are breached by the proposal as it is not proposed to service the development via a public road and Taronui road is 'narrower than the Council standard for roadways leading to more than 15 dwellings'[2].	
10.7.5.1.10 Hours of Operation	Not relevant.	Permitted
10.7.5.1.11 Keeping of Animals	Not relevant.	Permitted
10.7.5.1.12 Noise	Not relevant.	Permitted

Table 2 – General Coastal Zone Rule Assessment

Rule	Assessment	Status

[2] Refer Section 6.1 of the Traffic Assessment.

10.6.5.1.1 Visual Amenity	All buildings proposed are greater than the rule which specifies 25m^2 for non-habitable use. There is no existing building envelopes approved for the proposed built form that will result.	Discretionary
10.6.5.1.2 Residential Intensity	No residential units are proposed within the General Coastal Zone	Permitted
10.6.5.1.3 Scale of Activities	Given the size of the balance lot, the rule allows numerous non residential users. This is not breached.	Permitted
10.6.5.1.4 Building Height	All of the proposed buildings will have a height less than 8m.	Permitted
10.6.5.1.5 Sunlight	All buildings are sufficiently offset from boundaries to meet this rule.	Permitted
10.6.5.1.6 Stormwater Management	The proposal will not result in impervious surfaces that exceed 10% of the balance lot.	Permitted
10.6.5.1.7 Setback from Boundaries	All buildings are sufficiently offset from boundaries to meet this rule.	Permitted
10.6.5.1.8 Transportation	Traffic: The boat yard storage area does not generate traffic over and above that of the residential units as storage is strictly limited to residents. Parking:	Permitted

	Not relevant Access: As above, rule breaches are already sought, and the boat storage area does not increase traffic movements.	
10.6.5.1.9 Keeping of Animals	Not relevant.	Permitted
10.6.5.1.10 Noise	Not relevant.	Permitted
10.6.5.1.11 Helicopter Landing Area	Not relevant.	Permitted

Table 3 – District Wide Matters

Rule	**Assessment**	**Status**
12.1 Landscapes & Natural Features	There are no buildings or works proposed in the areas on the site which are overlain by an Outstanding Landscape.	Permitted
12.2 Indigenous Flora & Fauna	There is no vegetation clearance proposed.	Permitted
12.3 Soils & Minerals	More than 200m^3 and 2,000m^3 of works are being proposed in the Coastal Living and General Coastal Zones.	Discretionary
12.4 Natural Hazards	Dwellings 1-6, 12-14, and 18 are within 20m of existing vegetation. This is in contravention of Rule 12.4.6.1.2.	Discretionary
12.5 Heritage	Not relevant.	Permitted

12.7 Lakes, Rivers and Wetlands	All buildings and impervious surfaces are located more than 20m from these features	Permitted
12.8 Hazardous Substances	Not relevant.	Permitted
12.9 Renewable Energy & Energy Efficiency	Not relevant.	Permitted
13 Subdivision	Refer Table below	Non-Complying
14 Financial Contributions	Not relevant.	Permitted
15 Transportation	Refer Tables above	Discretionary
16 Signs and Lighting	Not relevant.	Permitted
17 Designation	Not relevant.	Permitted
18 Special Areas	Not relevant.	Permitted
19 GMO's	Not relevant.	Permitted

Table 4 – Subdivision Matters

Rule	**Assessment**	**Status**
13.7.1 Boundary Adjustments	Not relevant.	Permitted
13.7.2 Allotment Sizes, Dimensions and Other Standards	As outlined above, lot sizes are between 1,120m^2 and 2,585m^2. The dimensions of each allotment do not meet the 30m x 30m requirement, but a substantial dwelling	Non Complying

	can be located on each lot. No amalgamation of land is proposed between a rural zone and an urban or coastal zone. The site is split zoned but the controlled activity allotment sizes are not met for the Coastal Living Zone, but are met for the General Coastal Zone. This approach is not in accordance with Rule 13.7.2.4. There are no sites that are proposed which are divided by an Outstanding Landscape, Outstanding Landscape Feature or Outstanding Natural Feature. The site is not subject to 110kv lines or the National Grid.	
13.7.3 Controlled Subdivision Activities	The proposal is not for a Controlled Activity and is Non Complying as per 13.7.2 above.	Non Complying
13.7.4 Subdivision Within the National Grid Corridor for All Zones	Not relevant	Permitted

13.8.1 Subdivision Within The Rural Production Zone	Not relevant	Permitted
13.8.2 Subdivision Within100m of Minerals Zone	Not relevant	Permitted
13.8.3 Subdivision In The Golf Living Sub-Zone (Kauri Cliffs Zone)	Not relevant	Permitted
13.8.4 Subdivision in the General Coastal Zone	The balance lot which is largely located in the General Coastal Zone meets the 20ha minimum.	Restricted Discretionary
13.8.5 Subdivision in the Coastal Living and South Kerikeri Inlet Zone	Not relevant as the proposal does not meet the minimum allotment dimensions for a restricted discretionary activity in the Coastal Living Zone.	Non Complying
13.9.1 Minimum Net Area for Vacant New Lots and New Lots Which Already Accommodate Structure	Addressed in 13.7.2 above	Non Complying
13.9.2 Management Plans	Proposed in principle but not strictly met as a Management Plan is not provided as required by 13.9.2.2[f].	Non Complying

	The allotment sizes proposed are not an average size of 5,000m^2.	

Overall, the proposal is a Non Complying Activity.

5.2 Assessment of PDP Rules

Table 5 – PDP Rules with Legal Effect

Rule	Assessment	Status
Hazardous Substances	Not relevant as no such substances proposed.	Permitted
Heritage Area Overlays	Not indicated on PDP.	Permitted
Historic Heritage	Not indicated on PDP.	Permitted
Notable Trees	Not indicated on PDP.	Permitted
Sites and Areas of Significance to Māori	Not indicated on PDP	Permitted
Ecosystems and Indigenous Biodiversity	Not relevant as no clearance proposed.	Permitted
Activities on the Surface of Water	Not indicated on PDP.	Permitted
Earthworks	Earthworks will be undertaken in accordance with the PDP requirements [in accordance with GD-05 and subject to an ADP	Permitted
Signs	Not indicated on PDP.	Permitted
Orongo Bay Zone	Not indicated on PDP.	Permitted
Subdivision	The proposal is not for a subdivision that is	Permitted

	associated with a specific rule that has legal effect.	

Overall, no resource consent is required under the PDP.

5.3 Other Consents & Authorisations

In terms of Regional Council matters, consents are required as described earlier in this report.

These will be applied for concurrently with the FNDC application and both parties will be supplied with a SharePoint link for consideration.

6.0 NOTIFICATION ASSESSMENT

6.1 Public Notification

The table below outlines the steps associated with public notification insofar as it relates to s95 of the RMA.

Table 6 – s95 Adverse Effects Assessment

Step 1	Mandatory public notification in certain circumstances	
S95A(3)(a)	Has the applicant requested that the application be publicly notified?	No
S95A(3)(b)	Is public notification required under section 95C?(after a request for further information)	TBC
S95A(3)(c)	Has the application been made jointly with an application to exchange recreation reserve land under section 15AA of the Reserves Act 1977.	No
Step 2	if not required by step 1, public notification precluded in certain circumstances	
S95A(5)(a)	Is the application for a resource consent for 1 or more activities and each activity is subject to a rule or national environmental standard that precludes public notification?	No
S95A(5)(b)	Is the application for a resource consent for 1 or more of the following, but no other, activities; (i) a controlled activity;	No

	(i) a restricted discretionary, discretionary, or non-complying activity, but only if the activity is a boundary activity;	

As a result of the above, an assessment of effects is required to determine whether public notification is required under the RMA.

7.0 EFFECTS ON THE ENVIRONMENT

Effects on persons who are owners and occupiers of the land in, on, or over which the application relates, or of adjacent land must be disregarded when considering effects on the environment (s 95D(a)).

7.1 Effects that May be Disregarded

The permitted baseline may be taken into account should the Council deem it relevant. There are no permitted subdivisions allowable under the Operative and Proposed District Plans.

The underlying zoning of each site, being in the Coastal Living and General Coastal zone provides for very minor building works, up to 25m^2 for habitable and 50m^2 for non-habitable buildings. Earthworks are limited to 200m^3.

Therefore, despite the large size of the site and its potential to internalize effects, the level of permitted development possible on the site is minimal.

7.2 Effects Assessment

The following assessment has been prepared in accordance with Section 88 and Schedule 4 of the RMA which specifies that the assessment of effects provided should correspond with the scale and significance of the proposal.

7.2.1 Positive Effects

The proposal generates significant positive economic, social, cultural, and environmental effects for both the environment and the applicant.

Economically and socially, the 20-lot leasehold subdivision functions as a project that establishes an enduring, long-term revenue stream for the Tapuaetahi

Incorporation, directly supporting the wider aspirations of its Māori owners and their whānau in perpetuity.

Culturally, this mana whenua led development empowers the owners to actively exercise their rangatiratanga (self-determination) and kaitiakitanga (stewardship) over their ancestral lands.

From an environmental perspective, the project delivers substantial biodiversity gains by transitioning the site from a low diversity pastoral state to one with significantly greater habitat complexity.

This is achieved through a comprehensive indigenous restoration scheme that includes the creation of a 'vegetative bridge' to link fragmented native forest tracts between the Waiotia and Tapuaetahi streams, alongside a long term weed management strategy designed to progressively replace invasive exotic plants with appropriate indigenous coastal species.

These proposed inclusions as a result the proposal augment the underlying and existing environmental projects already being undertaken on the site by the applicant in line with the documents provided in **Appendix E**.

In addition, the proposal allows for 20 additional houses within the Far North District, which will spur economic growth and employment in the civil and construction industry for years to come.

7.2.2 Visual Amenity, Landscape and Natural Character Effects

The Littoralis report provided in **Appendix D** provides a comprehensive analysis of the proposed subdivision and associated land uses, concluding that the landscape, natural character, and visual amenity effects will be predominantly less than minor.

Situated on the threshold between the existing residential settlement and the rural hinterland, the site occupies pastoral land currently excluded from high natural character recognition. The site is no longer considered as being 'outstanding'.

The report identifies that the resulting level of natural character effects will be low, as the inner bay's character is already modified by existing built development and infrastructure.

This confirms the proposed dwelling sizes of 200m^2 with associated amenities and services along with the proposed allotment dimensions and building envelopes as appropriate in the coastal environment.

Landscape effects are assessed at a moderate-low level initially, expected to reduce to a low level within five years as the proposed restoration planting creates an extension of the broader natural vegetative patterns.

Visual amenity effects for the majority of viewing audiences, including beach users and boat passengers, are deemed low to very low due to the screening provided by the steep coastal flank.

The report acknowledges that a small number of residences positioned near the northwest corner and along the spur of Taronui Road may experience initial moderate-low effects, and these are categorised as less than minor, due to the timing of built development for Lots 13 and 14 which will be progressed after 2031.

These potential impacts are mitigated by the intended staging of the project and the rapid growth of natural vegetation within the Waiotia Stream valley, which will eventually block most views to the building platforms.

To align with the assessment criteria of the Coastal Living and General Coastal Zones, the proposal incorporates several high-level mitigation strategies.

Building heights are strictly limited to 5m for the majority of lots to minimise visual dominance, with a 7m limit reserved only for the least sensitive locations (Lots 4–6, 19, and 20). This directly addresses relevant assessment criteria regarding building bulk and height relative to ridgelines.

Furthermore, the proposal volunteers a 20% Light Reflectance Value (LRV) limit for roofs and 30% cladding on sensitive lots (1–10, 12–14, and 16), which for roofs, is more restrictive than the standard permitted activity thresholds, ensuring consistency with criteria regarding colour and reflectivity requirements under the ODP. Applies surface colours should fall within greyness groups A, B and C under the BS5252 colour palette.

The ‘Landscape Integration Concept’ introduces a structural ‘vegetative bridge’ designed to link native shrubland tracts, fulfilling criteria for landscape restoration and amenity maintenance under the Plan.

Specific physical mitigations, such as a 10m offset from the crest of the slope and the requirement that building platforms be cut into the natural ground rather than built on fill, further minimize the risk of visual obtrusiveness. A 3m high planted bund is specified for the secure boat compound to block views from Taronui Road.

Consent conditions resulting from these findings should include the mandatory installation of framework planting on the southern and western margins during Stage 1 to provide immediate buffering.

Perpetual retention of this planting and a requirement to replace any specimen tree losses should be formalised to ensure the outcomes predicted in the visual assessment are maintained over time. Vegetation for the proposed lots should be provided at time of development, but linked back to the overall planting ethos and regime constituted in **Appendix D**.

Additionally, the height and LRV restrictions should be secured via consent notices registered against the future titles to provide long-term certainty for the council and the community.

All building envelopes promoted on plans should be established on each LT plan to ensure that buildings are strictly developed within those areas which have been assessed.

Plans provided note that weed management is required and given the nature of the proposal, it is submitted that pest management will also be required as an activity that typically goes hand in hand. The nature and details of this pest and weed control will be provided prior to the approval of a scheme plan under s223 of the RMA, with implementation to be proven prior to titles being released under s224. Similarly, details of fencing, track creation, and minor sheds should also be deferred to detailed design.

Although not provided as part of the application, Tapuaetahi Incorporation will register private covenants against each dwelling allotment to ensure that development meets their expectations in terms of quality, design and retention of overall value.

7.2.3 Geotechnical and Natural Hazard Effects

The Site Suitability Report provided in **Appendix C** comprehensively covers these matters, a summary of which is provided below.

The project site is situated on a plateau underlain by clay-rich residual soils of the Kerikeri Volcanic Group. These soils are identified as having 'expansive' characteristics, meaning they do not meet the standard definition of 'good ground' and will require specific foundation designs at the building consent stage. It is not uncommon for this type of control to be promoted as a consent notice condition.

Geotechnical stability across the site ranges from low to high hazard. High hazard areas are specifically associated with moderately to steeply sloping land and identified historic head scarps along the coastal flanks.

To mitigate these risks, a 10m geotechnical setback has been established from the top of slope crest, and all proposed building envelopes have been sited behind this line.

Any future construction within identified medium or high-hazard zones will require a site specific stability analysis and certification by a Chartered Professional Engineer to ensure the long-term integrity of the dwellings. This aspect can be conditioned as a consent notice.

A comprehensive assessment of coastal and hydraulic hazards confirms that the proposed building platforms are located entirely outside of areas susceptible to coastal erosion, sea-level rise, or coastal inundation for 50-year and 100-year return periods.

While parts of the broader property adjacent to the Waiotia Stream and Tapuaetahi Creek are subject to river and coastal flooding, these risks are confined to the low lying gully bases and do not encroach upon the elevated development plateau.

To manage internal stormwater and prevent localized inundation, the development will achieve hydraulic neutrality.

This is facilitated by a 3,300m^3 attenuation pond to be provided as part of Stage 3 and the use of the internal roading network as a primary overland flow path.

Surface water cut-off drains will also be used to divert runoff away from building envelopes. Other hazards, including rockfall, alluvion, and avulsion, were investigated but found not to be relevant to the development area.

In terms of fire risk, the engineering report clarifies that because the site is within a Rural Fire District, the SNZ PAS 4509:2008 code is not strictly applicable and serves as guidance only. On this basis, it is recommended that firefighting provisions be assessed at the building consent stage, once the specific details of a site's particular development are known. This maintains flexibility for owners to choose between domestic sprinklers or on-site storage based on their specific build.

The report also recommends the installation of domestic sprinkler systems in accordance with NZ standards as an alternative to compensate for potentially extended emergency response times in this rural setting. There are standard consent notice conditions which can cover both options for those in the future who develop the land.

Based on the engineering and geotechnical evidence, it is concluded that the potential for the land to be subject to material damage from erosion, falling debris, subsidence, slippage, or inundation is low, provided the specified mitigation measures are implemented.

The proposed building envelopes, combined with the 10m stability setback and the comprehensive stormwater management system, ensure that the subdivision is suitable for residential use and will not increase the risk of natural hazards to the subject site or neighbouring properties.

The overall engineering judgement is that all relevant natural hazards are avoided, remedied or mitigated in accordance with Section 106 of the RMA and I concur with the findings promoted in this respect.

7.2.4 Stormwater Effects

The proposed development incorporates a comprehensive stormwater management strategy designed to achieve hydraulic neutrality. This is defined by ensuring that post-development peak discharge rates do not exceed pre-development levels, even when accounting for a 1% Annual Exceedance Probability (AEP) storm event and regional climate change allowances for the year 2100.

The site currently drains to two primary discharge points, designated as Point A and Point B. To mitigate potential downstream effects on the Te Tii Tapuaetahi No 41 Block, the engineering design uses surface water cut-off drains to redirect a significant portion of the runoff from Catchment A to Catchment B.

This redirection strategy effectively reduces the peak flow at Point A by 27% below pre-development levels, providing a substantial benefit to that existing drainage point.

To manage the resulting increase in flow volume at Point B, a centralized 3,300m^3 stormwater attenuation pond will be constructed. The timing of development for the pond ensures it is operational as the central plateau lots are developed and the cumulative increase in impervious surfaces occurs.

In addition to this centralised system, individual residential lots will be required to provide on-lot attenuation. These on-lot systems must be designed for a 10% AEP storm event and are required to attenuate runoff from 150% of the building roof area to compensate for driveways and other private hardstand surfaces. This requirement can be ensured through consent notice conditions applying to future development on each lot.

The physical infrastructure for stormwater conveyance consists of integrated primary and secondary systems. The primary system includes six roadway culverts and one boat yard culvert, all designed for a 10-year ARI event.

The secondary system utilizes open swale drains sized for a 100-year ARI event. These swales will feature low-level dense vegetation to provide natural filtration and are designed with specific ‘roughness’ values to prevent scour and manage water velocities.

Secondary flow paths have also been engineered across designated road sections to ensure that velocities do not exceed 0.4m/s, thereby protecting against land instability and erosion.

All stormwater devices are to be constructed concurrently with the respective roading stages to ensure continuous environmental compliance throughout the life of the project.

The stormwater infrastructure is a critical component, and it is envisaged that a maintenance programme will need to be provided to Council to ensure it remains fit for purpose and appropriate. Similar to the wastewater aspects below, the monitoring and overall management of these assets will be provided during detailed design for Council consideration.

From a planning perspective, provided the recommendations in the report are adhered to, potential adverse effects on the environment have been mitigated and result in less than minor effects.

7.2.5 Wastewater Effects

The wastewater management system for the proposal uses a decentralised, modified STEP system designed to meet advanced environmental standards in a non-reticulated rural setting.

This system is structured to provide high-level treatment on each individual lot before using communal storage and disposal.

The treatment process follows a multi-stage approach to ensure tertiary-level quality before land application. Each of the 20 residential units will be equipped with an advanced secondary onsite treatment system (such as a Packed Bed Reactor) and initial UV disinfection.

Then, treated effluent is pumped from each lot via a 50mm ID PE100 SDR11 low-pressure delivery network to a centralised facility. The facility includes a 30,000L above-ground storage tank which provides a minimum of 24 hours of emergency storage for the entire development. Before disposal, the combined effluent undergoes a second stage of UV disinfection at a communal treatment building to ensure consistent tertiary quality.

The disposal strategy is designed for the site's challenging soil conditions and topography. Site investigations identified the soil as Category 6 (slow draining). This necessitated a conservative design loading rate of 3 litres per day.

Effluent is applied via pressure-compensated drip irrigation lines. These are subsurface mounted to mitigate risks associated with the site's sloping terrain. A total of 8,000m^2 is provided, divided into 16 sequenced zones of 500m^2 each.

In addition, a 33% reserve area of 2,640m^2 is designated in the central portion of the site to provide long-term redundancy, should it be needed.

All disposal areas comply with ARC TP58 separation distances, including 1.5m from property boundaries, 5-10m from surface water for tertiary treated effluent, and a 600mm vertical separation from groundwater.

The system is engineered based on the following occupancy and flow assumptions:

- 6 people per dwelling (assuming a 4-bedroom unit).
- 1,200 litres per day per lot, based on a high-usage allowance of 200 L/person/day.
- The system is designed to manage a cumulative load from all 20 proposed lots.

To align with the project's six-stage subdivision rollout, the infrastructure will be installed in two primary phases. Phase 1 will be initiated during Stage 1and includes the formation of a temporary 4m-wide accessway to the WWTP site, installation of the 30,000L storage tank and UV building, and approximately 400m of reticulation serving Lots 1-12.

Phase 2 will be initiated during Stage 4 and involves an additional 312m of reticulation branching off the primary network to serve the remaining Lots 13-20.

The report recommends that the applicant develops a long-term asset management plan to cover monitoring, maintenance, and eventual renewal of the STEP system components. Design details of the exact system is also proposed to be deferred to a later stage which is a typical approach when considered a large communal system. Both aspects can be conditioned to be provided prior to the release of titles under s224.

Provided these recommendations are adhered to, the proposal is considered to appropriately mitigate adverse effects. Overall, the wastewater effects are considered to be less than minor.

7.2.6 Water Supply Effects

The water supply approach is based on individual site self-sufficiency for both potable and firefighting needs, as reticulated services are unavailable.

Each residential lot will be responsible for its own potable water supply, which is to be collected from building roofs and stored in dedicated on-site water tanks.

The site is rural in nature, and this necessitates specific provision for fire-fighting as previously described and considered in Section 7.2.3 above.

The use of roof-collected rainwater eliminates the need for groundwater bores, thereby avoiding potential cumulative effects on the local groundwater aquifers.

Based on the above, there are no effects arising in terms of water supply.

7.2.7 Traffic, Parking and Access Effects

The subdivision is expected to generate approximately 90 vehicle movements per day based on an average of 4.5 movements per household. This is significantly lower than the 10 movements per day envisaged by the ODP, which would envisage 200 traffic movements generated.

Purerua Road currently carries approximately 560 movements per day south of Taronui Road. The additional traffic is considered as 'relatively low level' that can be easily accommodated by the existing sealed road network. There are three single-lane bridges on the route to the site. The report concludes that the traffic increase on these structures will be a 'tiny fraction' of their total daily traffic and is unlikely to be noticed.

In terms of access, all 20 lots will be served by a single new internal roadway (Roadway A) connecting to the northern side of Taronui Road.

Taronui Road is a private, sealed roadway currently serving nearly 60 dwellings. While its width (4.8m to 5.5m) is narrower than Council standards for this number of lots, it is considered suitable given the low traffic generation and research suggesting narrower roads can result in positive safety effects.

Access to Taronui Road is via a PIN-actuated electric gate. With an average of one movement every three minutes during peak hours, no queuing or congestion onto Purerua Road is expected.

It is not proposed to vest Taronui Road, nor promote blanket public access, and there are no resulting effects from this position as the there is no subdivision less than 4ha proposed adjacent to a waterway or the coastal marine area that would warrant public access.

All parking can be accommodated within the individual lots, although these requirements are now voluntary due to the Councils adoption of the Kerikeri Waipapa Spatial Plan.

While no footpaths are proposed (consistent with a rural private access), pedestrian volumes are expected to be low. Safety is maintained by low operating speeds and existing speed control devices.

The report recommends two specific physical improvements to ensure safety, including sight benching west of the new access connection to Taronui Road at Stage 1 to ensure sight distances exceed safe stopping standards. The second aspect is the realignment of the Purerua Road/Taronui Road intersection to be perpendicular, which will be undertaken at Stage 4.

Given the above, it is concluded that the traffic, parking, and access effects associated with the proposal will be less than minor.

7.2.8 Earthwork & Construction Effects

The physical works for the subdivision will be delivered in six distinct stages to optimise engineering logistics and maintain an efficient cut-to-fill balance.

Earthworks are required for internal accessways, open drains, house platforms, private lot crossings, and a stormwater attenuation pond.

The total cut volume is 7,036m^3 with a total fill volume being 4,143m^3. This generates a surplus of 2,893m^3.

A large portion of the works are associated with the formation of the stormwater attenuation pond in Stage 3, which includes 3,300m^3 of works.

To assist in balancing, the boat storage yard in stage 6 requires a net fill of ~1,025m^3 along with a volume of material needed for form the screen bund. There will be surplus material, and it is proposed that as part of consent conditions, that an

approach / area is nominated to deal with this surplus material, ideally repurposed on the site.

All works are appropriately setback from localised waterways. The proposal is not considered to impact soils as the zoning envisages a form of residential development and all soils are Class 4 in nature which is not considered as highly productive.

The volume of earthworks and overall area of works requires additional approval from NRC as well as FNDC.

Whilst a thoughtful approach to earthworks design has been promoted, a specific mitigation approach has not yet been formulated as this is best considered to be developed alongside a local contractor.

Therefore, it is offered as a condition of consent, that the applicant provide a Soil and Erosion Control Plan in accordance with GD-05 associated with all works and that this is considered alongside an overall Construction Management Plan, both to be approved prior to any works being undertaken.

From a landscape perspective, in terms of setting floor levels, it is noted that the levels and adjusted contours shown in the Site Suitability Report and the Site Plans are intended to be indicative, with final resolution emerging from detailed design of those platforms (which would consider vehicle parking and manoeuvring, connected outdoor living spaces, etc).

It is recommended that the platforms for the more visually sensitive Lots 13 and 14, in particular, be set as close to the lowest part of the underlying natural terrain as is practicable through that detailed design process.

This approach above ensures that both councils have the opportunity to review and approve the approach to earthworks to ensure that effects are appropriately mitigated and remedied on completion. Accordingly, effects are considered to be less than minor.

7.2.9 Power & Telecoms Effects

The applicant is in communications with the suppliers of this infrastructure and will confirm that supply has been provided prior to titles being issued via a completion letter, noting that telecommunications may be provided via wireless technology [i.e.

starlink]. Provision of power will be provided underground as promoted in the Landscape Report.

From a broader energy perspective, the overall subdivision design has factored in the potential for maximum solar gain. The choice to install solar will be at each individual lot owners discretion.

7.2.10 Land Use Compatibility Effects

The proposed development is situated within an expansive 329ha landholding .

The development footprint is significantly internalised within this larger site, ensuring that the residential allotments are spatially removed from any sensitive 'environment' or neighbouring boundaries or activities.

The applicant manages a beef farming operation on the site and this will be the nearest activity needing to managed alongside the new residential uses.

The development areas spatial isolation is further reinforced by the 'basin-like' topography and a steep, heavily vegetated coastal flank that acts as a physical and visual barrier between the new lots and the existing shoreline settlement.

Comprehensive landscape mitigation is proposed to further secure this separation. A framework of indigenous restoration planting will create a vegetative bridge between existing forest tracts, while a structural planting belt and bunding will be used to encapsulate the boat storage area. These measures ensure that any potential visual or landscape impacts are mitigated to a level that is less than minor.

From a compatibility perspective, as these features will be difficult to observe, they will result in less than minor effects.

From a land use perspective, the provision of 20 residential dwellings and a communal boat storage facility is considered to be compatible with the objectives of the Coastal Living Zone and the emerging Māori Purpose - Rural Zone.

These activities are low intensity by nature and do not generate the significant adverse nuisance effects such as industrial noise, persistent odour, or heavy dust, typically associated with incompatible land uses.

There are no airports nearby which require consideration in terms of noise attenuation or reverse sensitivity management.

Furthermore, any temporary construction related effects will be managed through a specific Construction Management Plan adhering to GD-05 standards, ensuring that practical and appropriate controls remain in place throughout the phased delivery of the project. On this basis, the proposal is considered to have no adverse land use compatibility issues.

7.2.11 Ecological Effects

The proposed development is situated almost entirely on land that is currently managed as pastoral farmland and grazed paddocks. As such, the development area is clear of existing significant vegetation.

No clearance of indigenous forest or significant native vegetation is required to facilitate the subdivision or the boat storage facility. The proposal effectively avoids the most intact and diverse areas of native vegetation already present on the wider 329ha landholding.

A key consideration of the proposal is the implementation of a comprehensive indigenous restoration and framework planting scheme.

Key ecological enhancements include the creation of a vegetative bridge that links the substantial tracts of native shrubland associated with the Waiotia Stream to the north with those in the Tapuaetahi Stream catchment to the south. This corridor is designed to function as a vital ecological connection for local birdlife. Internal vegetation will cover the majority of the site not occupied by infrastructure, using several tiers of locally common native species.

These internal ecological enhancements are supported by the Incorporation's active participation in wider peninsula-wide initiatives.

The applicant currently provides leadership within the Te Tii Community Action Group and collaborates with Te Rūnanga o Ngāti Rēhia on marine restoration plans. Robust pest control is already operational, with active trapping occurring in partnership with Kiwi Coast as part of the Pest Free Pureua and Te Ahutai initiatives.

Additionally, the Incorporation's environmental farm plan indicates that existing restoration and native planting efforts, including the protection of rare species like black maire and the retirement of forestry, have likely more than offset carbon emissions from current farming operations.

The margins of the proposed stormwater retention pond and roadside swales will be planted with indigenous species, integrating these managed waterbodies into the natural landscape.

A long term pest and weed management strategy associated with the proposal, will be initiated primarily on the coastal flank to progressively replace invasive exotic plants with indigenous coastal species. Species selection within 20m of building areas will prioritise less flammable plants to manage fire risk while maintaining ecological value. Again, this will augment existing efforts which are provided in **Appendix E**.

While the site is situated in an area where kiwi are known to be present, the transition from pastoral land to a residential environment with extensive native planting can be managed to protect local fauna. Rather than a blanket prohibition on domestic pets, which is not typically required in this context, the proposal favours a management-based approach.

Property owners will be provided with advice and guidelines regarding responsible pet ownership to minimise potential interactions with wildlife. This includes practical measures such as containing cats and dogs indoors or within secure areas at night and ensuring dogs are under control at all times when outside.

These management strategies, combined with the Incorporation's involvement in existing community pest control, will ensure the continued protection of sensitive species.

Overall, the proposal moves the site from a modified, low diversity pastoral state to one that provides significantly greater habitat complexity and connectivity. When balancing the lack of vegetation clearance against the initiatives for restoration and ecological management, the overall ecological effects are assessed as being predominantly less than minor and ultimately positive in the long term

7.2.12 Easements & Covenants

There is no formal schedule of easements proposed at this stage on the scheme plan. I am advised that under s223 of the Act, the LT plan will promote appropriate easements for access, conveyance of water and wastewater and any other matter required, inclusive of areas subject to building envelope covenants and bush protection.

7.2.13 Heritage, Cultural and Archaeological Effects

The site is located within Te Riu o Ngāti Rēhia (Tribal Lands), where Ngāti Rēhia hold Ahi-Kā and Kaitiaki responsibilities. The applicant serves as the representative body for the Māori owners and their whānau, many of whom whakapapa to Ngāti Rēhia.

The proposal aligns with several core policies of the Ngāti Rēhia Hapu Environmental Management Plan [**HEMP**][3], as the HEMP seeks to build a "sustainable economic, social and cultural base" for the continued growth of the hapū and whānau. The Incorporation's primary purpose for this subdivision is to generate long-term revenue to support wider aspirations for its shareholders.

In terms of kaitiakitanga, the project incorporates comprehensive indigenous restoration, creating a vegetative bridge between existing tracts of native shrubland. The management of wastewater and water has been considered in a cultural context where stormwater, water supply, and wastewater are all separated and managed in a manner where discharge is primarily achieved via land.

This adheres to the HEMP's mandate to maintain and protect the mauri of the land and pass on a healthy environment to future generations.

The site has been managed as pastoral farmland and grazed paddocks for over 75 years. While the wider coastal region is rich in history—with missionary Samuel Marsden describing ancestral kainga in the bays of the Te Puna Inlet—the specific development area is currently clear of known built heritage or identified archaeological sites.

To manage the risk of unrecorded heritage, archaeological and cultural material, the applicant is volunteering an Accidental Discovery Protocol [ADP]. This protocol ensures that in the event of discovering any material [such as shell midden, oven stones, or stone tools] or kōiwi [human remains] during earthworks, work will cease

[3] Please see the HEMP here https://ngatirehia.co.nz/resources/#flipbook-df_1316/1/

immediately to allow for assessment by a qualified archaeologist and consultation with Ngāti Rēhia. This approach is consistent with the HEMP's insistence on full consultation over any development affecting heritage resources.

Considering the cultural context and matters above, the overall cultural effects are assessed as less than minor and ultimately positive.

7.2.14 Justification – 10 Year Consent Term

The proposal for a 10-year consent term for the applicant is supported by the Far North District Council's (FNDC) own Section 32 (s32) Report on Tangata Whenua, which identifies the unique structural barriers associated with developing Māori land.

The s32 report explicitly acknowledges that "resource consent is often required for any development on whenua Māori which creates a further barrier to social, cultural, economic and/or environmental wellbeing," and notes that the "complexity" of the papakāinga development process often involving multiple owners and a lack of access to traditional finance makes these projects "time-consuming and difficult to navigate."

By leveraging the s32 report's strategic objective TW-O5, which seeks to enhance the "economic, social and cultural well-being of tangata whenua," the applicant argues that a 10-year term is a necessary mechanism to provide the "certainty" and "flexibility" required to overcome the hurdles outlined in the s32 Report.

This AEE demonstrates that a longer term allows for a sensitive, six-stage infrastructure rollout and indigenous restoration scheme, ensuring that environmental effects remain "less than minor" as the landscape matures over a decade.

Securing this extended term would align with the Council's commitment to removing development barriers and recognising the "differing land tenure system" of Māori Freehold Land, ultimately enabling a sustainable revenue stream that supports the long-term aspirations of the mana whenua owners.

8.0 EFFECTS TO PEOPLE

The table below outlines the steps associated with limited notification insofar as it relates to s95 of the RMA.

Table 7 – s95 Affected Persons Assessment

Step 1	certain affected groups and affected persons must be notified	
S95B(2)(a)	Are there any affected protected customary rights groups?	No
S95B(2)(b)	Are there any affected customary marine title groups (in the case of an application for a resource consent for an accommodated activity)?	No
S95B(3)(a)	Is the proposed activity on or adjacent to, or may affect, land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11?	No
S95B(3)(b)	Is the person to whom the statutory acknowledgement is made is an affected person under section 95E?	No
Step 2	if not required by step 1, limited notification precluded in certain circumstances	
S95B(6)(a)	the application is for a resource consent for 1 or more activities, and each activity is subject to a rule or national environmental standard that precludes limited notification:	No
S95B(6)(b)	the application is for a controlled activity (but no other activities) that requires a resource consent under a district plan (other than a subdivision of land)	No

8.1 Affected Person Determination

As the proposed activity does not trigger mandatory limited notification, nor is it precluded, an assessment of potentially affected persons must be undertaken.

The consent authority has discretion to determine whether a person is an affected person. A person is affected if an activity's adverse effects are minor or more than minor to them.

8.2 Written Approvals Received & Consultation

No written approvals have been sought or provided.

8.3 Localised Effects Assessment [Effects to Persons]

The proposal involves the creation of 20 residential lots and a communal boat storage facility within an expansive landholding, with the physical execution of the project being managed across six distinct stages.

All land-disturbing activities are mandated to comply with Auckland Council GD-05 guidelines to prevent sediment discharge, while inherent geotechnical risks such as expansive soils and slope stability are managed through a 10m setback from steep coastal flanks and the requirement for site-specific engineering assessments at the building consent stage.

These approaches provide confidence to the residential development below the coastal flank that key hazards and potential effects have been attended to.

Temporary construction effects, including localised noise, dust, and heavy vehicle movements along the private Taronui Road, will be strictly controlled through a comprehensive Construction Management Plan. It is envisaged that this plan will provide key dates and details for neighbours.

While the proposal will be noticeable to the five immediate leasehold neighbours, the phased staging strategy ensures that disturbances are localised and temporary, with overall effects assessed as less than minor and acceptable.

Long-term visual amenity is protected by the site's 'basin-like' internal topography and a suite of design controls, including building height limits restricted to 5m for the majority of lots and light reflectance value limits for all roofs and cladding to ensure structures recede into the landscape.

Over a 10-year period, the proposed indigenous framework planting is expected to reach a height of 5–8m, providing a robust vegetative screen that further mitigates visual changes for the most affected residents and users of the coastal marine area.

The development is considered to be compatible with its zoning under the Coastal Living and Māori Purpose - Rural frameworks, representing a low-intensity residential use that sits on the threshold between the existing beach settlement and active pastoral farmland.

Ecologically, the proposal requires no clearance of indigenous forest and instead delivers significant biodiversity gains as previously noted.

Potential risks to local fauna, specifically kiwi, are managed through proactive property owner advice regarding domestic pet management rather than a blanket ban, ensuring a balanced approach to residential living and wildlife protection.

The project aligns with the Ngāti Rēhia HEMP by fostering a sustainable economic base for the hapū and respecting the mauri of the land through extensive restoration.

While the development site is currently clear of known archaeological features, a volunteered ADP provides a secure process for immediate consultation with Ngāti Rēhia should any heritage material or kōiwi be uncovered during the phased earthworks.

8.4 Effect to Persons Conclusion

In conclusion, the development is a technically sound and culturally responsive proposal that ensures potential adverse effects on the environment and adjoining persons are less than minor.

9.0 STATUTORY CONTEXT

9.1 Far North District Plan – ODP

An assessment of the relevant objectives and policies associated with the ODP has been undertaken and is found in tables below.

Table 8 – Tangata Whenua Chapter Assessment

Objective / Policy	Assessment
Objectives	
2.7.1 Through the provisions of the Resource Management Act, to give effect to the rights guaranteed to Māori by Te Tiriti O Waitangi (Treaty of Waitangi).	The proposal directly gives effect to the rights guaranteed to Māori by Te Tiriti o Waitangi as the applicant is the Tapuaetahi Incorporation, which serves as the representative body for the Māori owners and their whānau. This project is designed to provide long-term revenue to support the Incorporation's aspirations and beneficiaries, thereby allowing the owners to exercise their rangatiratanga over their ancestral lands.

Objective / Policy	Assessment
2.7.2 To enable Māori to develop and manage their land in a manner which is consistent with sustainable management of the natural and physical resources of the District as a whole.	This development enables Māori to manage and develop their ancestral land in a manner that is fundamentally consistent with sustainable management as evidenced in this report and supporting documents.
2.7.3 To recognise and provide for the protection of waahi tapu and other ancestral sites and the mauri (life force) of natural and physical resources.	The design of the proposal has been considered by the applicant, who has access to centuries of history associated with the land. We were advised that the proposal elements are not located on or near any significant sites of importance. In terms of the recognition and provision of mauri, the proposal ethos has been to work with the natural environment to promote an appropriate housing development that ensures natural and physical resources are ensured for future generations.
Policies	
2.8.1 That Council will provide opportunities for the involvement of tangata whenua in the sustainable management of the natural and physical resources of the District.	Opportunities for the involvement of tangata whenua are fully realised in this instance, as the tangata whenua themselves, via the Tapuaetahi Incorporation, are the primary proponents and applicants for the development. The Incorporation is directly leading the sustainable management of their own natural and physical resources through this comprehensive, master-planned proposal.

Objective / Policy	Assessment
2.8.2 That tangata whenua be consulted over the use, development or protection of natural resources where these affect their taonga.	Consultation with tangata whenua is inherent to the core of this application, as the Incorporation represents the Māori owners whose taonga and ancestral lands are the subject of the development. The project has been formulated from the outset to respect and protect their interests and leverage their land for positive effects to people, place, and property.
2.8.3 That the Council will have regard to relevant provisions of any whanau, hapu or iwi resource management plans, taiapure plans or mahinga mataitai plans.	The applicant has had direct regard to the relevant provisions of the Ngāti Rēhia HEMP. The proposal explicitly aligns with the HEMP's stated policies regarding sustainable economic development for the hapū and the practical exercise of kaitiakitanga through the restoration and protection of native ecosystems.
2.8.4 That development on ancestral land will be provided for, consistent with the requirement for sustainable management of resources.	Development on ancestral land is provided for in a manner that is entirely consistent with the requirement for sustainable management of resources. The project utilizes a small portion of a larger 329ha landholding and implements detailed engineering advice to ensure that the carrying capacity of the site is promoted.

Objective / Policy	Assessment
2.8.5 That waahi tapu and other taonga be identified and protected by provisions in the Plan.	The proposal ensures that any potential taonga or unrecorded wāhi tapu are identified and protected during the development phase through the implementation of a volunteered Accidental Discovery Protocol.

Table 9 – Coastal Living Zone Assessment

Objective / Policy	Assessment
Objectives	
10.7.3.1 To provide for the wellbeing of people by enabling low density residential development to locate in coastal areas where any adverse effects on the environment of such development are able to be avoided, remedied or mitigated.	The proposal fulfils this objective by providing for the well-being of the Māori owners of the Tapuaetahi Incorporation through a 20-lot low-density residential subdivision on their ancestral land. Adverse effects are avoided or mitigated as described earlier in this report.
10.7.3.2 To preserve the overall natural character of the coastal environment by providing for an appropriate level of subdivision and development in this zone.	The proposal preserves the overall natural character of the coastal environment by locating the development on currently modified pastoral farmland while completely avoiding identified areas of HNC. By creating only 20 residential lots as a cluster within a significantly larger 329.6ha landholding, the project maintains an appropriate and sustainable level of subdivision that protects the broader coastal integrity.
Policies	

Objective / Policy	Assessment
10.7.4.1 That the adverse effects of subdivision, use, and development on the coastal environment are avoided, remedied or mitigated.	Adverse effects on the coastal environment are avoided or mitigated as described in this report.
10.7.4.2 That standards be set to ensure that subdivision, use or development provides adequate infrastructure and services and maintains and enhances amenity values and the quality of the environment.	Through adherence to the standards within the Plan, it is contended that the proposal represents a subdivision, use and future development which meets this policy in full.

10.7.4.3 Subdivision, use and development shall preserve and where possible enhance, restore and rehabilitate the character of the zone in regards to s6 matters, and shall avoid adverse effects as far as practicable by using techniques including: (a) clustering or grouping development within areas where there is the least impact on natural character and its elements such as indigenous vegetation, landforms, rivers, streams and wetlands, and coherent natural patterns; (b) minimising the visual impact of buildings, development, and associated vegetation clearance and earthworks, particularly as seen from public land and the coastal marine area; (c) providing for, through siting of buildings and development and design of subdivisions, legal public right of access to and use of the foreshore and any esplanade areas; (d) through siting of buildings and development, design of subdivisions, and provision of access that recognise and provide for the relationship of Māori with their culture, traditions and taonga including concepts of mauri, tapu, mana, wehi and karakia and the important contribution Māori culture makes to the character of the District (refer ***Chapter 2***, and in particular ***Section 2.5***, and Council's "*Tangata Whenua Values and Perspectives (2004)"*);	The proposal comprehensively addresses this policy by clustering the residential lots within areas of the site that have the least impact on natural character, effectively avoiding steep flanks and existing native vegetation. Visual impact is minimized through building height restrictions (typically 5m), light reflectance value limits for structures, and the use of a 3m-high planted bund to screen the boat storage yard from Taronui Road. Public access to the coast is not currently provided, nor is it proposed to be. The entire subdivision design is a mana whenua-led initiative that inherently recognizes and provides for the relationship of Māori with their culture and ancestral lands. Ecological character is rehabilitated through the creation of a vegetative bridge that links existing habitats of indigenous fauna, and historic heritage is protected by siting development on previously disturbed farmland and volunteering an ADP to safeguard any previously unrecorded finds.

Objective / Policy	Assessment
(e) providing planting of indigenous vegetation in a way that links existing habitats of indigenous fauna and provides the opportunity for the extension, enhancement or creation of habitats for indigenous fauna, including mechanisms to exclude pests; (f) protecting historic heritage through the siting of buildings and development and design of subdivisions.	

Table 10 – General Coastal Zone Assessment

Objective / Policy	Assessment
Objectives	
10.6.3.1 To provide for appropriate subdivision, use and development consistent with the need to preserve its natural character.	The proposal provides for appropriate residential subdivision and development as described above.
10.6.3.2 To preserve the natural character of the coastal environment and protect it from inappropriate subdivision, use and development.	Refer to the response above for the Coastal Living Zone.
10.6.3.3 To manage the use of natural and physical resources (excluding minerals) in the general coastal area to meet the reasonably foreseeable needs of future generations.	Provision of roads, wastewater infrastructure and storage is considered to meet the needs of the associated residential development.
Policies	

Objective / Policy	Assessment
10.6.4.1 That a wide range of activities be permitted in the General Coastal Zone, where their effects are compatible with the preservation of the natural character of the coastal environment.	The proposed boat storage facility is compatible with the General Coastal Zone, as it represents a low-intensity use that does not generate significant industrial "nuisance" effects like odour or high-decibel noise. This activity is integrated into the landscape through its positioning the use of significant native planting, and a specified colour and reflectivity regime, ensuring it is compatible with the preservation of the surrounding coastal character.
10.6.4.2 That the visual and landscape qualities of the coastal environment in be protected from inappropriate subdivision, use and development.	Visual and landscape qualities are protected through a suite of enforceable consent conditions and consent notices which are described in the report above.

10.6.4.3 Subdivision, use and development shall preserve and where possible enhance, restore and rehabilitate the character of the zone in regards to s6 matters, and shall avoid adverse effects as far as practicable by using techniques including: (a) clustering or grouping development within areas where there is the least impact on natural character and its elements such as indigenous vegetation, landforms, rivers, streams and wetlands, and coherent natural patterns; (b) minimising the visual impact of buildings, development, and associated vegetation clearance and earthworks, particularly as seen from public land and the coastal marine area; (c) providing for, through siting of buildings and development and design of subdivisions, legal public right of access to and use of the foreshore and any esplanade areas; (d) through siting of buildings and development, design of subdivisions and provision of access, that recognise and provide for the relationship of Māori with their culture, traditions and taonga including concepts of mauri, tapu, mana, wehi and karakia and the important contribution Māori culture makes to the character of the District. (Refer ***Chapter 2*** and in particular ***Section 2.5*** and Council's *"Tangata Whenua Values and Perspectives (2004)"*;	Refer to the response above for the Coastal Living Zone.

Objective / Policy	Assessment
(e) providing planting of indigenous vegetation in a way that links existing habitats of indigenous fauna and provides the opportunity for the extension, enhancement or creation of habitats for indigenous fauna, including mechanisms to exclude pests; (f) protecting historic heritage through the siting of buildings and development and design of subdivisions.	
10.6.4.4 That controls be imposed to ensure that the potentially adverse effects of activities are avoided, remedied or mitigated as far as practicable.	Refer to the response above for the Coastal Living Zone.
10.6.4.5 Māori are significant land owners in the General Coastal Zone and therefore activities in the zone should recognise and provide for the relationship of Māori and their culture and traditions, with their ancestral lands, water, sites, waahi tapu and other taonga and shall take into account the principles of the Treaty of Waitangi.	The proposal recognizes the Tapuaetahi Incorporation as a significant Māori landowner and provides for their relationship with their ancestral lands by enabling sustainable development that supports their people. The project takes into account the principles of Te Tiriti o Waitangi by allowing the Incorporation to manage and develop their own resources in a way that respects their culture, traditions, and wāhi tapu.
10.6.4.6 The design, form, location and siting of earthworks shall have regard to the natural character of the landscape including terrain, landforms and indigenous vegetation and shall avoid, remedy or mitigate adverse effects on those features.	As provided for earlier in the report and in **Appendix B and Appendix D**, there is considerable mitigation proposed in association with the earthworks required for the development.

Table 11 – Subdivision Chapter ODP Assessment

Objective / Policy	Assessment
Objectives	
13.3.1 To provide for the subdivision of land in such a way as will be consistent with the purpose of the various zones in the Plan, and will promote the sustainable management of the natural and physical resources of the District, including airports and roads and the social, economic and cultural well-being of people and communities.	The proposal is considered to be fundamentally consistent with the purpose of the Coastal Living and General Coastal zones. By enabling the Tapuaetahi Incorporation to develop their ancestral land, the project promotes the sustainable management of natural resources while directly enhancing the social, economic, and cultural well-being of the Māori owners and their whānau.
13.3.2 To ensure that subdivision of land is appropriate and is carried out in a manner that does not compromise the life-supporting capacity of air, water, soil or ecosystems, and that any actual or potential adverse effects on the environment which result directly from subdivision, including reverse sensitivity effects and the creation or acceleration of natural hazards, are avoided, remedied or mitigated.	The subdivision is designed to ensure it does not compromise the life-supporting capacity of the environment. The specific items mentioned such as reverse sensitivity and natural hazards are specifically considered and their effects mitigated.
13.3.3 To ensure that the subdivision of land does not jeopardise the protection of outstanding landscapes or natural features in the coastal environment.	The development is situated entirely outside any identified Outstanding Landscapes or Outstanding Natural Features.

Objective / Policy	Assessment
13.3.4 To ensure that subdivision does not adversely affect scheduled heritage resources through alienation of the resource from its immediate setting/context.	The proposal does not adversely affect any scheduled heritage resources, as there are no identified heritage archaeological sites within the development footprint.
13.3.5 To ensure that all new subdivisions provide a reticulated water supply and/or on-site water storage and include storm water management sufficient to meet the needs of the activities that will establish all year round.	New lots will be required to provide on-site water storage to meet year-round needs. Stormwater management is comprehensively addressed as detailed in this report.
13.3.6 To encourage innovative development and integrated management of effects between subdivision and land use which results in superior outcomes to more traditional forms of subdivision, use and development, for example the protection, enhancement and restoration of areas and features which have particular value or may have been compromised by past land management practices.	The project represents an innovative and integrated approach to land use, formulated to be consistent with the ethos of management plan provisions. It results in superior environmental outcomes as described in this report.
13.3.7 To ensure the relationship between Māori and their ancestral lands, water, sites, wāhi tapu and other taonga is recognised and provided for.	This is achieved as previously described above.
13.3.8 To ensure that all new subdivision provides an electricity supply sufficient to meet the needs of the activities that will establish on the new lots created.	An underground supply will be provided.

Objective / Policy	Assessment
13.3.9 To ensure, to the greatest extent possible, that all new subdivision supports energy efficient design through appropriate site layout and orientation in order to maximise the ability to provide light, heating, ventilation and cooling through passive design strategies for any buildings developed on the site(s).	Energy-efficient design is supported through the thoughtful layout and orientation of building platforms. The platforms are configured to optimize solar gain for heating and light, utilizing the site's natural contours to maximize the potential for passive design in the future.
13.3.10 To ensure that the design of all new subdivision promotes efficient provision of infrastructure, including access to alternative transport options, communications and local services.	The subdivision promotes the efficient provision of infrastructure through a centralized roading network and a two-phase wastewater system. No alternative transport options are proposed.
13.3.11 To ensure that the operation, maintenance, development and upgrading of the existing National Grid is not compromised by incompatible subdivision and land use activities	This objective is not applicable.
Policies	

Objective / Policy	Assessment
13.4.1 That the sizes, dimensions and distribution of allotments created through the subdivision process be determined with regard to the potential effects including cumulative effects, of the use of those allotments on: (a) natural character, particularly of the coastal environment; (b) ecological values; (c) landscape values; (d) amenity values; (e) cultural values; (f) heritage values; and (g) existing land uses.	The size and distribution of the 20 allotments were determined with careful regard to the site's constraints. Potential cumulative effects on natural character, landscape, and amenity are managed through the clustering of development on pastoral land and the use of substantial 'framework' planting to integrate the new lots into the wider rural-coastal context.
13.4.2 That standards be imposed upon the subdivision of land to require safe and effective vehicular and pedestrian access to new properties.	Safe and effective vehicular and pedestrian access is promoted.
13.4.3 That natural and other hazards be taken into account in the design and location of any subdivision.	Natural hazards have been comprehensively assessed and mitigated through consent conditions.
13.4.4 That in any subdivision where provision is made for connection to utility services, the potential adverse visual impacts of these services are avoided.	To avoid adverse visual impacts, all utility services, including power and wastewater reticulation, will be installed underground.

Objective / Policy	Assessment
13.4.5 That access to, and servicing of, the new allotments be provided for in such a way as will avoid, remedy or mitigate any adverse effects on neighbouring property, public roads (including State Highways), and the natural and physical resources of the site caused by silt runoff, traffic, excavation and filling and removal of vegetation	The servicing of new allotments is managed to avoid adverse effects on neighbouring properties and natural resources as detailed earlier in this report.
13.4.6 That any subdivision proposal provides for the protection, restoration and enhancement of heritage resources, areas of significant indigenous vegetation and significant habitats of indigenous fauna, threatened species, the natural character of the coastal environment and riparian margins, and outstanding landscapes and natural features where appropriate.	The proposal provides for the extensive restoration and enhancement of the coastal environment through a comprehensive indigenous planting scheme which has been previously described.
13.4.7 That the need for a financial contribution be considered only where the subdivision would: (a) result in increased demands on car parking associated with non-residential activities; or (b) result in increased demand for esplanade areas; or (c) involve adverse effects on riparian areas; or (d) depend on the assimilative capacity of the environment external to the site.	Not relevant.

Objective / Policy	Assessment
13.4.8 That the provision of water storage be taken into account in the design of any subdivision.	Refer to policies above.
13.4.9 That bonus development donor and recipient areas be provided for so as to minimise the adverse effects of subdivision on Outstanding Landscapes and areas of significant indigenous flora and significant habitats of fauna.	Not relevant.
13.4.10 The Council will recognise that subdivision within the Conservation Zone that results in a net conservation gain is generally appropriate.	Not relevant.
13.4.11 That subdivision recognises and provides for the relationship of Māori and their culture and traditions, with their ancestral lands, water, sites, waahi tapu and other taonga and shall take into account the principles of the Treaty of Waitangi.	As provided earlier, this is engrained in the entire design of the proposal.
13.4.12 That more intensive, innovative development and subdivision which recognises specific site characteristics is provided for through the management plan rule where this will result in superior environmental outcomes.	The proposal adopts an innovative management plan-based approach that recognises the specific characteristics of the coastal basin terrain. This results in superior environmental outcomes compared to traditional grid-like subdivision, as it allows for clustering that protects natural patterns and integrates significant ecological restoration.

13.4.13 Subdivision, use and development shall preserve and where possible enhance, restore and rehabilitate the character of the applicable zone in regards to s6 matters. In addition subdivision, use and development shall avoid adverse effects as far as practicable by using techniques including: (a) clustering or grouping development within areas where there is the least impact on natural character and its elements such as indigenous vegetation, landforms, rivers, streams and wetlands, and coherent natural patterns; (b) minimising the visual impact of buildings, development, and associated vegetation clearance and earthworks, particularly as seen from public land and the coastal marine area; (c) providing for, through siting of buildings and development and design of subdivisions, legal public right of access to and use of the foreshore and any esplanade areas; (d) through siting of buildings and development, design of subdivisions, and provision of access that recognise and provide for the relationship of Māori with their culture, traditions and taonga including concepts of mauri, tapu, mana, wehi and karakia and the important contribution Māori culture makes to the character of the District (refer ***Chapter 2*** and in particular ***Section 2.5*** and Council's *"Tangata*	These aspects have been previously addressed.

Objective / Policy	Assessment
Whenua Values and Perspectives" (2004); (e) providing planting of indigenous vegetation in a way that links existing habitats of indigenous fauna and provides the opportunity for the extension, enhancement or creation of habitats for indigenous fauna, including mechanisms to exclude pests; (f) protecting historic heritage through the siting of buildings and development and design of subdivisions. (g) achieving hydraulic neutrality and ensuring that natural hazards will not be exacerbated or induced through the siting and design of buildings and development.	
13.4.14 That the objectives and policies of the applicable environment and zone and relevant parts of ***Part 3*** of the Plan will be taken into account when considering the intensity, design and layout of any subdivision.	Refer to these in tables above.

Objective / Policy	Assessment
13.4.15 That conditions be imposed upon the design of subdivision of land to require that the layout and orientation of all new lots and building platforms created include, as appropriate, provisions for achieving the following: (a) development of energy efficient buildings and structures; (b) reduced travel distances and private car usage; (c) encouragement of pedestrian and cycle use; (d) access to alternative transport facilities; (e) domestic or community renewable electricity generation and renewable energy use.	Consent conditions not specifically volunteered for these items, however the overall design has considered the potential of these outcomes.

Objective / Policy	Assessment
13.4.16 When considering proposals for subdivision and development within an existing National Grid Corridor the following will be taken into account: (a) the extent to which the proposal may restrict or inhibit the operation, access, maintenance, upgrading of transmission lines or support structures; (b) any potential cumulative effects that may restrict the operation, access, maintenance, upgrade of transmission lines or support structures; and (c) whether the proposal involves the establishment or intensification of a sensitive activity in the vicinity of an existing National Grid line. Note 1: Structures and activities located near transmission lines must comply with the safe distance requirements in the New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP34:2001). Compliance with this plan does not ensure compliance with NZECP34:2001. Note 2: Vegetation to be planted within, or adjacent to, the National Grid Corridor should be selected and/or managed to ensure that it will not result in that vegetation breaching the Electricity (Hazards from Trees) Regulations 2003.	Not relevant.

Table 12 – Tangata Whenua Chapter PDP Assessment

Objectives	Assessment

TW-O1 Tangata whenua and Council have a strong, high trust and enduring partnership based on the principles of Te Tiriti o Waitangi / The Treaty of Waitangi.	The proposal exemplifies a high-trust partnership approach, as the Tapuaetahi Incorporation—the representative body for the Māori owners and their whānau—is the primary applicant leading the process. By enabling the Incorporation to master-plan their own ancestral land, the resource management process respects the principles of Te Tiriti o Waitangi through self-determination and sustainable land use.
TW-O2 Tangata whenua are provided with opportunities to actively participate as kaitiaki in resource management processes.	The project provides a direct and active opportunity for tangata whenua to act as kaitiaki by leading the environmental stewardship of the site.
TW-O3 Historic heritage, which includes sites and areas of significance to Māori and cultural resources, is managed to ensure its long-term protection for future generations.	While no specific historic heritage sites were identified within the modified pastoral development area, the long-term protection of potential cultural heritage is secured through the volunteering of an Accidental Discovery Protocol.
TW-O4 Tangata whenua maintain mana whenua in their rohe through strong and enduring relationships with their culture and traditions, ancestral lands, water, sites, wāhi tapu, and other taonga.	The development reinforces the mana of the Tapuaetahi Incorporation by enabling their sustainable development and continued occupation of their ancestral lands.
TW-O5 The economic, social and cultural well-being of tangata whenua is enhanced through the development of Māori land administered under Te Ture Whenua Māori Act 1993 and land returned in the Treaty settlement process.	The proposal explicitly enhances the economic, social, environmental, and cultural well-being of tangata whenua by developing Māori land administered under Te Ture Whenua Māori Act 1993. The Council would support the applicant to achieve this by approving a 10 year consent term.

Policies	Assessment
TW-P1 Work proactively with Iwi and Hapū to identify, and where agreed to, implement: a. Mana Whakahono a Rohe / Iwi participation arrangements; b. joint management agreements under section 36B of the RMA; and c. other arrangements as agreed.	This policy is proactively implemented through the very nature of this application, where tangata whenua are the drivers of the resource management process for their own land. The project represents a collaborative effort where the Incorporation works to achieve sustainable outcomes that align with both Council expectations and iwi/hapū aspirations.
TW-P2 Ensure that tangata whenua are provided with opportunities to actively participate in resource management processes which involve ancestral lands, water, sites, wāhi tapu and other taonga, including through: a. recognition of the holistic nature of the Māori worldview; b. the exercise of kaitiakitanga; c. the acknowledgement of matauranga Māori; d. regard to Iwi/Hapū environmental management plans; and e. any other agreements.	Active participation is realised through the Incorporation's leadership in the subdivision design, which recognizes the holistic nature of the Māori worldview and the exercise of kaitiakitanga. Specific regard has been given to the Ngāti Rēhia HEMP to ensure that the proposal acknowledges mātauranga Māori and reflects regional hapū priorities.
TW-P3 Protect the values of Māori historic heritage, cultural resources, wāhi tapu and other taonga by: a. collaborating with Iwi and Hapū to identify significant sites and cultural resources; b. scheduling significant sites and areas of significance to Māori; and	Cultural resources and values are protected by clustering the 20 residential lots on the least sensitive pastoral land and avoiding prominent geotechnically fragile coastal flanks. The applicant recognizes that the site is part of a wider cultural landscape and utilises substantial indigenous planting and a volunteered ADP to safeguard these

c. recognising that sites and areas of significance to Māori are often associated with a wider cultural landscape which holds significance to tangata whenua.	environmental and heritage associations.
TW-P4 Enable economic, social and cultural well-being of tangata whenua through the use and development land administered under Te Ture Whenua Māori Act 1993 and returned under treaty settlement, while managing adverse effects on the environment.	The proposal enables the well-being of tangata whenua by providing for residential and storage development on Māori land while rigorously managing adverse effects through engineered infrastructure and landscape screening. Technical assessments for site suitability and landscape character ensure that the environmental impacts remain less than minor, balancing development with environmental care.
TW-P5 Recognise tangata whenua as specialists in the tikanga of their Iwi or Hapū, including when preparing or undertaking a cultural impact assessment.	The Incorporation is recognised as the specialist in the tikanga of their own whenua, and their leading role in the project's design and formulation ensures that cultural impacts are understood and addressed. The design reflects an internal expertise regarding the site's traditions, ensuring that the development is culturally appropriate and supportive of the community's heritage. A specific cultural impact assessment is therefore, not warranted in this case.
TW-P6 Consider the following when assessing applications for land use and subdivision that may result in adverse effects on the relationship of tangata whenua with their ancestral lands, water, sites, wāhi tapu and other taonga:	The proposal meets these criteria through the direct involvement of the associate hapū body as the applicant and its full alignment with the Ngāti Rēhia HEMP.

a. any consultation undertaken with Iwi, Hapū or marae with an association to the site or area; b. any Iwi/Hapū environmental management plans lodged with Council; c. any identified sites and areas of significance to Māori; d. whether a cultural impact assessment has been undertaken by a suitably qualified person who is acknowledged/endorsed by the Iwi, Hapū or relevant marae, and any recommended conditions and/or monitoring to achieve desired outcomes; e. any protection, preservation or enhancement proposed; f. any relevant treaty settlement legislation; g. any relevant statutory acknowledgement area identified in APP2- Statutory acknowledgement areas; h. Te Rautaki o Te Oneroa-a-Tōhe/ Te Oneroa-a-Tōhe (Ninety Mile Beach) Management Plan; and i. any relevant relationship agreements or arrangement between Council and any Iwi Authority or Hapū.	

Table 13 – Māori Purpose Zone - Rural PDP Assessment

Objectives	**Assessment**

MPZ-O1 The viability of the Māori Purpose zone is ensured for future generations.	The proposal ensures the long-term viability of the Māori Purpose zone for future generations by establishing a sustainable revenue stream for the Tapuaetahi Incorporation. Rather than a one-off development, the creation of leasehold lots provides an enduring economic base that supports the Incorporation's wider social and cultural aspirations for its beneficiaries and whānau in perpetuity without losing land in perpetuity.
MPZ-O2 The Māori Purpose zone enables a range of social, cultural and economic development opportunities that support the occupation, use, development and ongoing relationship with ancestral land.	This development directly enables a range of social and economic opportunities by providing for 20 residential dwellings and a communal boat storage facility on ancestral land. These activities support the ongoing relationship of the Māori owners with their land by providing the financial means for the Incorporation to maintain its stewardship and invest in further initiatives. Some of these have included the repossession and purchase of land.
MPZ-O3 Use and development in the Māori Purpose zone reflects the sustainable carrying capacity of the land and surrounding environment.	The proposal reflects the sustainable carrying capacity of the land by clustering only 20 residential lots within a significantly larger 329.6ha landholding, ensuring that the vast majority of the site remains in open pastoral use. The use of advanced wastewater treatment and site-specific geotechnical setbacks further ensures that development does not exceed the

	environmental limits of the coastal setting.
Policies	**Assessment**
MPZ-P1 Provide for the use and development of ancestral Māori land administered under Te Ture Whenua Māori Act 1993.	The land is confirmed as Māori Freehold land as outlined on the Record of Title in **Appendix A**.
MPZ-P2 Enable a range of activities on Māori land in the Māori Purpose zone including marae, papakāinga, customary use, cultural and small-scale commercial activities where the adverse effects can be avoided, remedied or mitigated.	A range of activities is enabled, including both residential dwellings and a small-scale boat storage facility. Adverse effects of these activities are avoided, remedied, or mitigated as detailed in this report.
MPZ-P3 Provide for development on Māori land where it is demonstrated: a. it is compatible with surrounding activities; b. it will not compromise occupation, development and use of Māori land; c. it will not compromise use of adjacent land or other zones to be efficiently and effectively used for their intended purpose; d. it maintains character and amenity of surrounding area; e. it provides for community wellbeing, health and safety; f. it can be serviced by onsite infrastructure or reticulated infrastructure where this is available; and g. that any adverse effects can be avoided, remedied or mitigated.	The development is demonstrated to be compatible with surrounding activities while not compromising the Incorporation's ability to continue its primary farming operations on the balance of the land. It maintains the character and amenity of the area by using natural topography for screening and provides for community well-being through secure revenue. Servicing is achieved through a combination of on-site primary treatment and reticulated communal secondary treatment, ensuring environmental and public health standards are met.

MPZ-P4 Manage land use and subdivision to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application: a. consistency with the scale, density, design and character of the environment and purpose of the zone; b. the location, scale and design of buildings and structures; c. the positive effects resulting from the economic, social and cultural wellbeing provided by the proposed activity. d. at zone interfaces: i. any setbacks, fencing, screening or landscaping required to address potential conflicts; ii. managing reverse sensitivity effects on adjacent land uses, including the ability of surrounding properties to undertake primary production activities in a rural environment; e. the adequacy and capacity of available or programmed development infrastructure to accommodate the proposed activity; or the capacity of the site to cater for on-site infrastructure	Land use and subdivision are managed through a detailed consideration of scale and design, with 20 lots representing a low-density approach consistent with the 'informal, seaside character' of the environment. There are no concerning zone interface challenges as landscaping provides a buffer between proposed uses and existing beef farming activities. All other matters have been previously addressed.

associated with the proposed activity; f. the adequacy of roading infrastructure to service the proposed activity; g. managing natural hazards; h. any loss of highly productive land; i. adverse effects on areas with historic heritage and cultural values, natural features and landscapes, natural character or indigenous biodiversity values; and j. any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.	

Table 14 – Coastal Environment PDP Assessment

Objectives	**Assessment**
CE-O1 The natural character of the coastal environment is identified and managed to ensure its long-term preservation and protection for current and future generations.	Refer responses to the objectives and policies in both the General Coastal Zone and Coastal Living Zone.
CE-O2 Land use and subdivision in the coastal environment: a. preserves the characteristics and qualities of the natural character of the coastal environment; b. is consistent with the surrounding land use;	Land use and subdivision are managed to preserve natural character by clustering the 20 residential lots within a 'basin-like' internal topography that is largely visually separated from the coast. The development is consistent with the surrounding Coastal Living character and avoids urban sprawl by

c. does not result in urban sprawl occurring outside of urban zones; d. promotes restoration and enhancement of the natural character of the coastal environment; and e. recognises tangata whenua needs for ancestral use of whenua Māori.	concentrating development near the existing Tapuaetahi settlement. Furthermore, the project promotes significant restoration through a 'vegetative bridge' and recognizes the specific needs of tangata whenua for the ancestral use of whenua Māori.
CE-O3 Land use and subdivision in the coastal environment within urban zones is of a scale that is consistent with existing built development.	While the site is not located within a traditional urban zone, the proposed residential scale is consistent with the existing built development in the Tapuaetahi leasehold area.
Policies	**Assessment**
CE-P1 Identify the extent of the coastal environment as well as areas of high and outstanding natural character using the assessment criteria in APP1- Mapping methods and criteria.	The extent of the coastal environment and areas of natural character have been identified using the relevant ODP and PDP overlays.
CE-P2 Avoid adverse effects of land use and subdivision on the characteristics and qualities of the coastal environment identified as: a. outstanding natural character; b. ONL; c. ONF.	The proposal entirely avoids adverse effects on Outstanding Natural Character areas, ONLs, and ONFs by ensuring that the development footprint is located well outside these identified sensitive zones.
CE-P3 Avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of land use and subdivision on the characteristics and qualities of the coastal environment not identified as: a. outstanding natural character;	Adverse effects on the characteristics of the coastal environment not identified as outstanding are avoided, remedied, or mitigated through integrated design and landscape controls.

b. ONL; c. ONF.	
CE-P4 Preserve the visual qualities, character and integrity of the coastal environment by: a. consolidating land use and subdivision around existing urban centres and rural settlements; and b. avoiding sprawl or sporadic patterns of development.	The proposal preserves the visual integrity of the coastal environment by consolidating the new subdivision near the existing Tapuaetahi settlement. By clustering the 20 lots within a small portion of the 329.6ha landholding, the project avoids sporadic or sprawling patterns of development that would otherwise compromise the open character of the wider Purerua peninsula.
CE-P5 Enable land use and subdivision in urban zones within the coastal environment where: a. there is adequacy and capacity of available or programmed development infrastructure; and b. the use is consistent with, and does not compromise the characteristics and qualities.	Although not an urban zone, the proposal demonstrates that the site has the adequacy and capacity for self-sufficient infrastructure.
CE-P6 Enable farming activities within the coastal environment where: a. the use forms part of the values that established the natural character of the coastal environment; or b. the use is consistent with, and does not compromise the characteristics and qualities.	Farming activities are enabled to continue on the vast majority of the 329.6ha landholding, as the subdivision occupies only a small area of low-productivity pastoral land. The continued use of the surrounding balance of the land for grazing is consistent with the values that established the coastal environment's character and is not compromised by the clustered residential development.

CE-P7 Provide for the use of Māori Purpose zoned land and Treaty Settlement land in the coastal environment where: a. the use is consistent with the ancestral use of that land; and b. the use does not compromise any identified characteristics and qualities.	The use of Māori Purpose zoned land in the coastal environment is explicitly provided for and is sought through this proposal.
CE-P8 Encourage the restoration and enhancement of the natural character of the coastal environment.	The proposal actively encourages the restoration and enhancement of natural character through a comprehensive landscape plan.
CE-P9 Prohibit land use and subdivision that would result in any loss and/or destruction of the characteristics and qualities in outstanding natural character areas.	This policy is satisfied as the proposal is located entirely outside of any mapped Outstanding Natural Character areas.
CE-P10 Manage land use and subdivision to preserve and protect the natural character of the coastal environment, and to address the effects of the activity requiring resource consent, including (but not limited to) consideration of the following matters where relevant to the application: a. the presence or absence of buildings, structures or infrastructure; b. the temporary or permanent nature of any adverse effects; c. the location, scale and design of any proposed development; d. any means of integrating the building, structure or activity;	The proposal is managed to preserve the natural character of the coastal environment by carefully considering the site's ability to absorb change. There are various mitigation measures proposed which directly attend to the matters sought to be addressed.

e. the ability of the environment to absorb change; f. the need for and location of earthworks or vegetation clearance; g. the operational or functional need of any regionally significant infrastructure to be sited in the particular location; h. any viable alternative locations for the activity or development; i. any historical, spiritual or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6; j. the likelihood of the activity exacerbating natural hazards; k. the opportunity to enhance public access and recreation; l. the ability to improve the overall quality of coastal waters; and m. any positive contribution the development has on the characteristics and qualities.	

Table 15 – Subdivision Chapter PDP Assessment

Objectives	**Assessment**
SUB-O1 Subdivision results in the efficient use of land, which: a. achieves the objectives of each relevant zone, overlays and district wide provisions; b. contributes to the local character and sense of place;	As evidenced in the various assessment of objectives and policies, the proposal is consistent with zone specific and district wide criteria. Relevant aspects have been directly attended to and a full mitigation package is provided.

c. avoids reverse sensitivity issues that would prevent or adversely affect activities already established on land from continuing to operate; d. avoids land use patterns which would prevent land from achieving the objectives and policies of the zone in which it is located; e. does not increase risk from natural hazards or risks are mitigates and existing risks reduced; and f. manages adverse effects on the environment.	
SUB-O2 Subdivision provides for the: a. Protection of highly productive land; and b. Protection, restoration or enhancement of Outstanding Natural Features, Outstanding Natural Landscapes, Natural Character of the Coastal Environment, Areas of High Natural Character, Outstanding Natural Character, wetland, lake and river margins, Significant Natural Areas, Sites and Areas of Significance to Māori, and Historic Heritage.	These features are not readily applicable to the development area.
SUB-O3 Infrastructure is planned to service the proposed subdivision and development where:	Appropriate infrastructure is provided.

a. there is existing infrastructure connection, infrastructure should be provided in an integrated, efficient, coordinated and future-proofed manner at the time of subdivision; and b. where no existing connection is available infrastructure should be planned and consideration be given to connections with the wider infrastructure network.	
SUB-O4 Subdivision is accessible, connected, and integrated with the surrounding environment and provides for: a. public open spaces; b. esplanade where land adjoins the coastal marine area; and c. esplanade where land adjoins other qualifying waterbodies.	The subdivision is accessible and integrated in the context of its rural setting which is reliant on a private motor vehicle for general access.
Policies	**Assessment**
SUB-P1 Enable boundary adjustments that: a. do not alter: i. the degree of non-compliance with District Plan rules and standards; ii. the number and location of any access; and iii. the number of certificates of title; and b. are in accordance with the minimum lot sizes of the zone and comply with access,	Not relevant.

infrastructure and esplanade provisions.	
SUB-P2 Enable subdivision for the purpose of public works, infrastructure, reserves or access.	Not relevant.
SUB-P3 Provide for subdivision where it results in allotments that: a. are consistent with the purpose, characteristics and qualities of the zone; b. comply with the minimum allotment sizes for each zone; c. have an adequate size and appropriate shape to contain a building platform; and d. have legal and physical access.	There are no minimum allotments for the Māori Purpose Zone, however allotment size has been determined via expert assessment and are considered to be appropriate. Legal and physical access is promoted and sufficient building platforms are proposed.
SUB-P4 Manage subdivision of land as detailed in the district wide, natural environment values, historical and cultural values and hazard and risks sections of the plan.	Subdivision management is addressed through a detailed assessment of district-wide values, including natural hazards, historical values, and natural character in this report.
SUB-P5 Manage subdivision design and layout in the General Residential, Mixed Use and Settlement zone to provide for safe, connected and accessible environments by: a. minimising vehicle crossings that could affect the safety and efficiency of the current and future transport network; b. avoid cul-de-sac development unless the site or the topography prevents future public access and connections;	The design and layout of the subdivision promote a safe and connected environment by using the site's natural topography to create a cohesive neighbourhood basin. Vehicular crossings are minimized through a structured internal roading network, and social interaction is encouraged through the inclusion of a communal boat storage yard and a shared pedestrian walkway to the beach, fostering a distinct sense of place within the Tapuaetahi settlement.

c. providing for development that encourages social interaction, neighbourhood cohesion, a sense of place and is well connected to public spaces; d. contributing to a well-connected transport network that safeguards future roading connections; and e. maximising accessibility, connectivity by creating walkways, cycleways and an interconnected transport network.	
SUB-P6 Require infrastructure to be provided in an integrated and comprehensive manner by: a. demonstrating that the subdivision will be appropriately serviced and integrated with existing and planned infrastructure if available; and b. ensuring that the infrastructure is provided in accordance with the purpose, characteristics and qualities of the zone.	Infrastructure is provided in an integrated and comprehensive manner, with a clear staging plan demonstrating how each phase will be appropriately serviced.
SUB-P7 Require the vesting of esplanade reserves when subdividing land adjoining the coast or other qualifying waterbodies.	The proposed subdivision does not meet the requirements to provide public access or esplanades under the RMA.
SUB-P8 Avoid rural lifestyle subdivision in the Rural Production zone unless the subdivision: a. will protect a qualifying SNA in perpetuity and result in the SNA	Not relevant.

being added to the District Plan SNA schedule; and b. will not result in the loss of versatile soils for primary production activities.	
SUB-P9 Avoid subdivision rural lifestyle subdivision in the Rural Production zone and Rural residential subdivision in the Rural Lifestyle zone unless the development achieves the environmental outcomes required in the management plan subdivision rule.	Not relevant.
SUB-P10 To protect amenity and character by avoiding the subdivision of minor residential units from principal residential units where resultant allotments do not comply with minimum allotment size and residential density.	Not relevant.
SUB-P11 Manage subdivision to address the effects of the activity requiring resource consent including (but not limited to) consideration of the following matters where relevant to the application: a. consistency with the scale, density, design and character of the environment and purpose of the zone; b. the location, scale and design of buildings and structures; c. the adequacy and capacity of available or programmed development infrastructure to accommodate the proposed activity; or the capacity of the site	Subdivision effects are comprehensively managed through careful consideration of scale, density, and design, with the 20-lot layout remaining consistent with the character of the existing settlement. The adequacy of on-site infrastructure is proven through detailed engineering for wastewater and stormwater, while natural hazards are also addressed through engineering design and recommendations. Finally, the proposal respects the cultural associations held by tangata whenua by adhering to the principles of

to cater for on-site infrastructure associated with the proposed activity; d. managing natural hazards; e. any adverse effects on areas with historic heritage and cultural values, natural features and landscapes, natural character or indigenous biodiversity values; and f. any historical, spiritual, or cultural association held by tangata whenua, with regard to the matters set out in Policy TW-P6.	the Ngāti Rēhia HEMP and volunteering an ADP for all physical works.

9.2 Regional Policy Statement for Northland [RPS]

An assessment of the relevant objectives and policies associated with the RPS for Northland has been undertaken and is also found in tables below. The RPS sets region wide objectives and policies for the environment.

Table 16 – RPS Assessment

Objective / Policy	Assessment
Integrated Catchment Management	The proposal adopts an integrated catchment approach by aligning its six-stage earthworks program with the natural hydrology of the site, which drains into the Waiotia Stream and Tapuaetahi Creek watersheds. Earthworks are designed to balance cut and fill locally within each stage, minimising the footprint of exposed soil and managing overland flow paths via a dedicated stormwater retention pond

	and roadside swales. This ensures that the development functions as a cohesive hydrological unit within the broader catchment.
Region Wide Water Quality	Water quality is protected through the implementation of a dual-phase wastewater system—combining on-site primary treatment with reticulated communal secondary treatment—to ensure discharges meet high environmental standards before leaving the site. Furthermore, all construction activities will adhere to Auckland Council GD-05 sediment and erosion control guidelines to prevent the discharge of contaminants into the sensitive Taronui Bay coastal environment.
Ecological Flows and Water Quality	The development achieves hydraulic neutrality through the construction of a stormwater detention pond in Stage 3, which is specifically engineered to reduce post-development peak flows back to pre-development rates. By managing runoff intensity and providing secondary flow paths via open swale drains, the proposal ensures that the ecological flows of the surrounding streams are not adversely impacted by increased impervious surfaces. No localised water take is required to service the development as water will be provided via tanks.

Indigenous Ecosystems & Biodiversity	Biodiversity values are significantly enhanced through a comprehensive indigenous restoration scheme that creates a vegetative bridge linking fragmented forest tracts associated with the Waiotia and Tapuaetahi streams. The project requires no clearance of existing native forest, as development is clustered on modified pastoral land, and instead introduces thousands of locally common native plants to expand habitats for indigenous fauna.
Enabling Economic Wellbeing	The proposal is an endeavour by the Tapuaetahi Incorporation to provide a sustainable economic base for its Māori owners and their whānau. By creating 20 leasehold residential lots and a storage facility, the project generates long-term revenue that enables the Incorporation to support its wider community aspirations and maintain its role as a key contributor to the regional economy. There will also be ongoing economic growth and employment benefits resulting from construction and civil works that are required to realise the proposal.
Economic Activities – Reverse Sensitivity and Sterilisation	The subdivision is designed to avoid the sterilization of productive land by clustering residential development on a localized area of low-productivity (Class 4) pastoral soil, leaving the vast majority of the 329.6ha landholding available for primary production. Reverse sensitivity effects are mitigated by the compatible nature of the residential use and

	landscaping to physically and visually separate activities.
Regionally Significant Infrastructure	The development does not compromise the operation or maintenance of regionally significant infrastructure, as it uses its own internal private roading network and does not involve activities near the National Grid. However, the 9m tsunami siren mast alongside Taronui Road demonstrates the site's integration with regional safety and utility services.
Efficient and Effective Infrastructure	Infrastructure for the subdivision is planned to be both efficient and effective, using a phased delivery strategy that ensures all lots are fully serviced with power, wastewater, and stormwater controls at the time of development.
Security of Energy Supply	Energy security for the future residents is provided through the installation of an underground reticulated electricity supply to each allotment.
Use and Allocation of Common Resources	The proposal represents a sustainable allocation of ancestral land resources, transitioning a portion of pastoral land into a high-value residential use while protecting common coastal resources. By strictly managing wastewater and stormwater quality, the project ensures that the shared coastal marine area of Taronui Bay is not degraded by the increased intensity of land use.

Regional Form	The development adheres to efficient regional form by consolidating residential growth adjacent to the existing Tapuaetahi settlement rather than encouraging sporadic sprawl. This approach uses the site's unique basin-like topography to contain the built footprint, ensuring that the subdivision reads as a logical extension of the established seaside village.
Tangata Whenua Role in Decision Making	Tangata whenua are the primary decision-makers and proponents for this development, with the Tapuaetahi Incorporation leading the project to achieve its own cultural and social objectives. The proposal is fully informed by the Ngāti Rēhia HEMP, ensuring that hapū-specific policies regarding kaitiakitanga and economic self-determination are at the centre of the resource management process.
Natural Hazard Risk	Risk from natural hazards is effectively avoided or mitigated through comprehensive geotechnical and engineering design.]
Natural Character, Outstanding Natural Features, Outstanding Natural Landscapes and Historic Heritage	The proposal ensures the long-term preservation of high-value natural and heritage resources by entirely avoiding these features

Having considered the relevant components of the RPS, it is concluded that the proposal is not inconsistent with the relevant objectives and policies.

9.4 National Policy Statements and Environmental Standards

The table below considers these matters.

Table 17 – NPS and NES Assessment

Document	Assessment
New Zealand Coastal Policy Statement	The proposal is consistent with the NZCPS as it preserves the natural character of the coastal environment by clustering development on historically modified pastoral land and avoiding all identified Outstanding Natural Landscapes, Outstanding Natural Features, and High Natural Character areas. It specifically gives effect to Policy 6 by providing for the use of Māori land for the social and economic well-being of the Tapuaetahi Incorporation while maintaining the coastal environment's integrity through strict building height and colour controls.
National Policy Statement for Infrastructure	The proposal demonstrates an integrated approach to servicing by providing coordinated wastewater and stormwater systems across its six construction stages. Effects to public infrastructure such as Purerua Road are managed via consent conditions.
Natural Policy Statement for Natural Hazards	The proposal is consistent with the objectives of natural hazard management by locating building platforms outside of geotechnically challenging areas and establishing a 10m setback from steep coastal flanks. The site suitability report identifies low-to-

	moderate risks from expansive soils and slope instability, which are effectively mitigated through site-specific engineering and the construction of a stormwater pond to maintain hydraulic neutrality.
National Policy Statement for Highly Productive Land	The NPS-HPL is not applicable to the proposal as the development is situated on soils categorized as Class 4.
National Policy Statement for Electricity Networks	This NPS is not applicable as the proposal does not involve the operation, maintenance, or development of the National Grid. The subdivision will be served by localized underground reticulation that does not interface with or compromise any high-voltage transmission infrastructure.
National Policy Statement for Renewable Electricity Generation	The proposal does not involve large-scale renewable electricity generation and is therefore not directly impacted by this NPS. However, the energy-efficient design of the allotments maximizes the potential for future residents to utilize passive solar heating and cooling, which aligns with the broader goals of sustainable energy use.
National Policy Statement for Greenhouse Gas Emission from Industrial Process Heat	This NPS is not applicable as the proposal is for a low-intensity residential subdivision and boat storage facility and does not involve any industrial processes or the use of industrial process heat.
National Policy Statement on Urban Development	The proposal supports the intent of the NPS-UD by providing for well-functioning

	development that contributes to the choice and well-being of the Māori owners and their whānau outside of the urban areas of Kerikeri. This is a complementary approach to the more dense and intensive approach proposed for urban areas in the Far North District.
National Environmental Standards for Detached Minor Residential Units	This standard is not applicable as the proposal seeks consent for 20 principal residential dwellings rather than minor units. Any future minor units on these allotments would be subject to the relevant District Plan and NES standards at the time of their application.
National Environmental Standards for Commercial Forestry	The proposal does not involve commercial forestry activities and is therefore not applicable to this NES. The project's focus is on indigenous restoration and residential land use.
National Environmental Standards for Marine Aquaculture	This NES is not applicable as the development is entirely land-based and does not involve any aquaculture activities within the Coastal Marine Area.
National Environmental Standards for Sources of Human Drinking Water	The proposal protects potential drinking water sources by implementing an advanced wastewater system that includes communal secondary treatment to prevent ground or surface water contamination. All earthworks and stormwater management are designed to adhere to GD-05 standards, ensuring that runoff does not degrade the quality of the surrounding water catchments.

National Environmental Standards for Greenhouse Gas Emissions from Industrial Process Heat	This NES is not applicable as the subdivision and storage yard do not involve any industrial activities that would generate significant greenhouse gas emissions from process heat.
National Environmental Standards for Electricity Transmission Activities	This standard is not applicable as there are no existing National Grid lines or structures within or near the site that would be affected by the proposed subdivision or earthworks.
National Environmental Standards for Freshwater	The proposal complies with the NES-F as it does not involve the reclamation or drainage of significant wetlands or permanent watercourses. While ephemeral flow paths are present, these are managed through a stormwater detention pond designed to achieve hydraulic neutrality and protect the downstream health of the Waiotia Stream and Tapuaetahi Creek catchments.
National Environmental Standards for Storing Tyres Outdoors	This standard is not applicable as the proposal does not involve the storage of tyres outdoors. The boat storage yard is strictly for the parking and storage of vessels and related marine equipment.
National Environmental Standards for Air Quality	The proposal will not result in long-term adverse effects on air quality. Potential dust generation during the construction of the proposal via earthworks will be managed through a specific Construction Management Plan and will be temporary. Consents for odour from the wastewater system will be sought from NRC and

	managed within those regional baselines as opposed to the national requirements.
National Environmental Standards for Telecommunication Facilities	This NES is not applicable as the proposal does not involve the construction of telecommunication masts or facilities beyond the existing 9m tsunami siren mast, which is an established part of regional safety infrastructure.
National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health	The NESCS is not applicable as the site has a history of pastoral grazing and is not identified on the Hazardous Activities and Industries List (HAIL). Consequently, there is no identified risk to human health from soil contaminants.

9.5 Conclusion

The above assessment finds that the proposal is not inconsistent with relevant statutory and higher order objectives and policies.

10.0 PART 2 ASSESSMENT

10.1 Section 5 - Purpose of the RMA

Section 5 in Part 2 of the RMA identifies the purpose as being the sustainable management of natural and physical resources. This means managing the use of natural and physical resources in a way that enables people and communities to provide for their social, cultural and economic well-being which sustain those resources for future generations, protecting the life supporting capacity of ecosystems, and avoiding remedying or mitigating adverse effects on the environment.

It is considered that proposal represents Part 2, Section 5 of the RMA.

10.2 Section 6 - Matters of National Importance

In achieving the purpose of the RMA, a range of matters are required to be recognised and provided for. This includes:

a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:

d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:

e) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga:

f) the protection of historic heritage from inappropriate subdivision, use, and development:

g) the protection of protected customary rights:

h) the management of significant risks from natural hazards.

In context, the relevant items to the proposal have been recognised and provided for.

10.3 Section 7 - Other Matters

In achieving the purpose of the RMA, a range of matters are to be given particular regard. This includes:

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

(ba) the efficiency of the end use of energy:

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

(e) [Repealed]

(f) maintenance and enhancement of the quality of the environment:

(g) any finite characteristics of natural and physical resources:

(h) the protection of the habitat of trout and salmon:

(i) the effects of climate change:

(j) the benefits to be derived from the use and development of renewable energy.

These matters have been given particular regard through the design of the proposal.

10.4 Section 8 - Treaty of Waitangi

The Far North District Council is required to take into account the principles of the Treaty of Waitangi when processing this consent. This consent application may be sent to local Iwi and hapū who may have an interest in this application.

10.5 Part 2 Conclusion

Given the above, it is considered that the proposal meets the purpose of the RMA.

11.0 SECTION 104D

Section 104D of the Resource Management Act 1991 establishes a ‘gateway test’ for non-complying activities, requiring that an application satisfy at least one of two specific limbs before the consent authority can consider it under Section 104.

The first limb, under Section 104D(1)(a), requires that the adverse effects of the activity on the environment will be minor.

As detailed throughout this Assessment of Environmental Effects and supported by the specialist reports, the proposal fulfills this requirement. The actual and potential adverse effects, encompassing visual amenity, natural character, and coastal character, have been assessed as being predominantly less than minor, with only minor effects identified for a limited number of immediate residential neighbors.

These findings are predicated on a robust suite of mitigation measures, including stringent building design controls, a phased construction strategy, and the implementation of a comprehensive indigenous restoration scheme. Consequently, the proposal is considered to pass the first gateway.

The second limb, under Section 104D(1)(b), requires that the application be for an activity that will not be contrary to the objectives and policies of the relevant plans.

A comprehensive evaluation against the ODP, the PDP, and the Regional Policy Statement for Northland demonstrates that the proposal is consistent with, and not contrary to, the overarching policy framework.

The development specifically gives effect to the 'Māori purpose' of the ancestral land and recognises the principles of Te Tiriti o Waitangi by enabling the Tapuaetahi Incorporation to undertake a socially inspired project for the well-being of its owners. Because the proposal is positively supported by the objectives and policies regarding tangata whenua development, coastal preservation, and ecological enhancement, it satisfies the second gateway.

In conclusion, as the proposal satisfies both limbs of the Section 104D gateway test, the Council has the jurisdiction to consider the substantive merits of the application under Section 104.

The development represents an appropriate and sustainable use of the land that balances the social and economic aspirations of the mana whenua owners with the ongoing protection of the coastal environment's natural character. On this basis, it is submitted that the 'gateway' is passed, and consent can be granted.

12.0 CONCLUSION

A Non-Complying Activity resource consent is sought from the Far North District Council to carry out the proposed subdivision and associated land use activities.

The proposal is considered to result in less than minor effects on the environment and through assessment, there are less than minor effects to persons.

The proposal is not considered contrary to the objectives and policies of both District Plans [Operative and Proposed].

The proposal is consistent with the Regional Policy Statement for Northland and achieves the purpose of the RMA.

Relevant NPS' and NES' have been considered with the proposal finding consistency with their general aims and intent.

Regards,

Steven Sanson

Consultant Planner

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Guaranteed Search Copy issued under Section 60 of the Land Transfer Act 2017

R.W. Muir
Registrar-General of Land

Identifier	**NA112A/909**
Land Registration District	**North Auckland**
Date Issued	19 September 1997

Prior References
NA105B/497

Estate	Fee Simple
Area	329.6124 hectares more or less
Legal Description	Lot 2-3 Deposited Plan 176907, Lot 5 Deposited Plan 177923 and Lot 1 Deposited Plan 184896

Registered Owners
The Proprietors of Tapuetahi

Interests

Subject to a drainage right (in gross) over part marked A on SO 61880 in favour of Her Majesty the Queen for a State Primary School created by Gazette Notice B868621.1 - 29.7.1988 at 1.42 pm

C425585.1 STATUS ORDER DETERMINING THE STATUS OF THE WITHIN LAND TO BE MAORI FREEHOLD LAND - 28.10.1992 AT 9.00 AM

Appurtenant hereto is a right of way specified in Easement Certificate D110562.1 - 20.2.1997 at 2.10 pm

Subject to a right of way over part marked B on DP 142825 specified in Easement Certificate D110562.1 - 20.2.1997 at 2.10 pm (affects Lot 1 DP 184896)

The easements specified in Easement Certificate D110562.1 are subject to Section 243 (a) Resource Management Act 1991

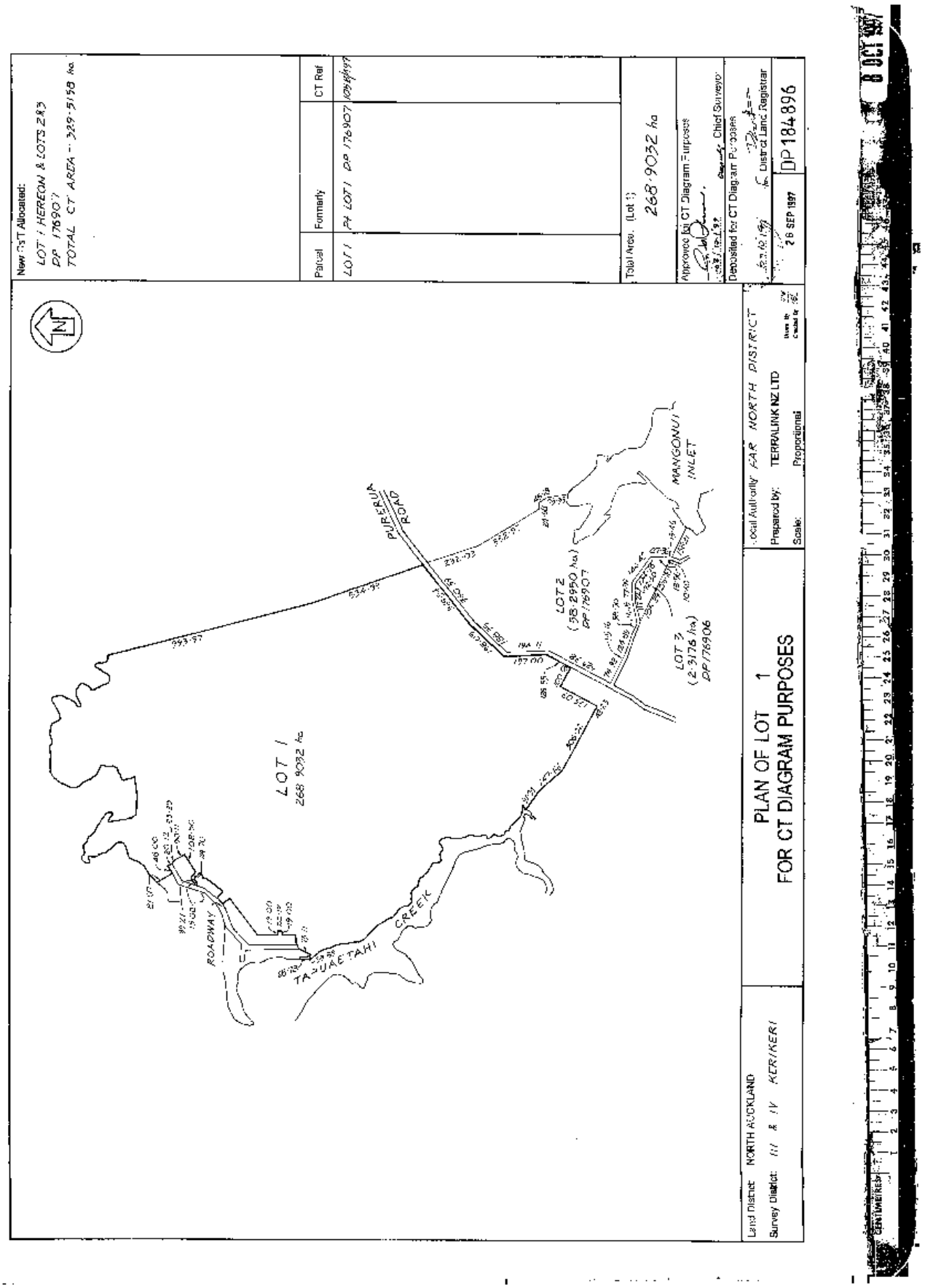
Subject to a right of way over part marked C on DP 177923 created by Court Order D178367.1 - produced 4.8.1997 at 9.00 am and entered 19.9.1997 at 9.00 am

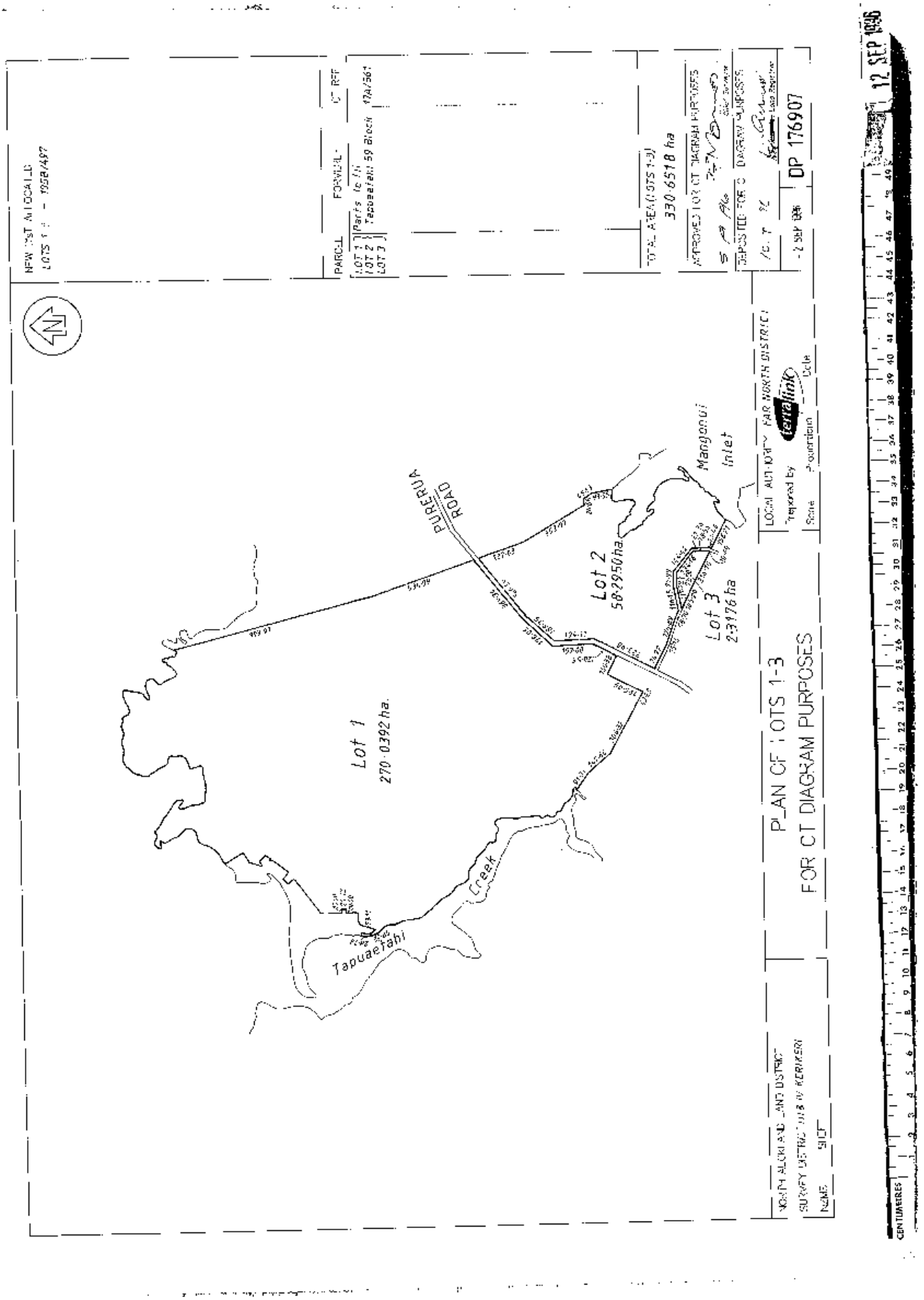
Subject to laying out a roadway over part created by Maori Land Court Order D178368.1 - produced 4.8.1997 at 9.00 am and entered 19.9.1997 at 9.00 am (affects Lot 5 DP 177923)

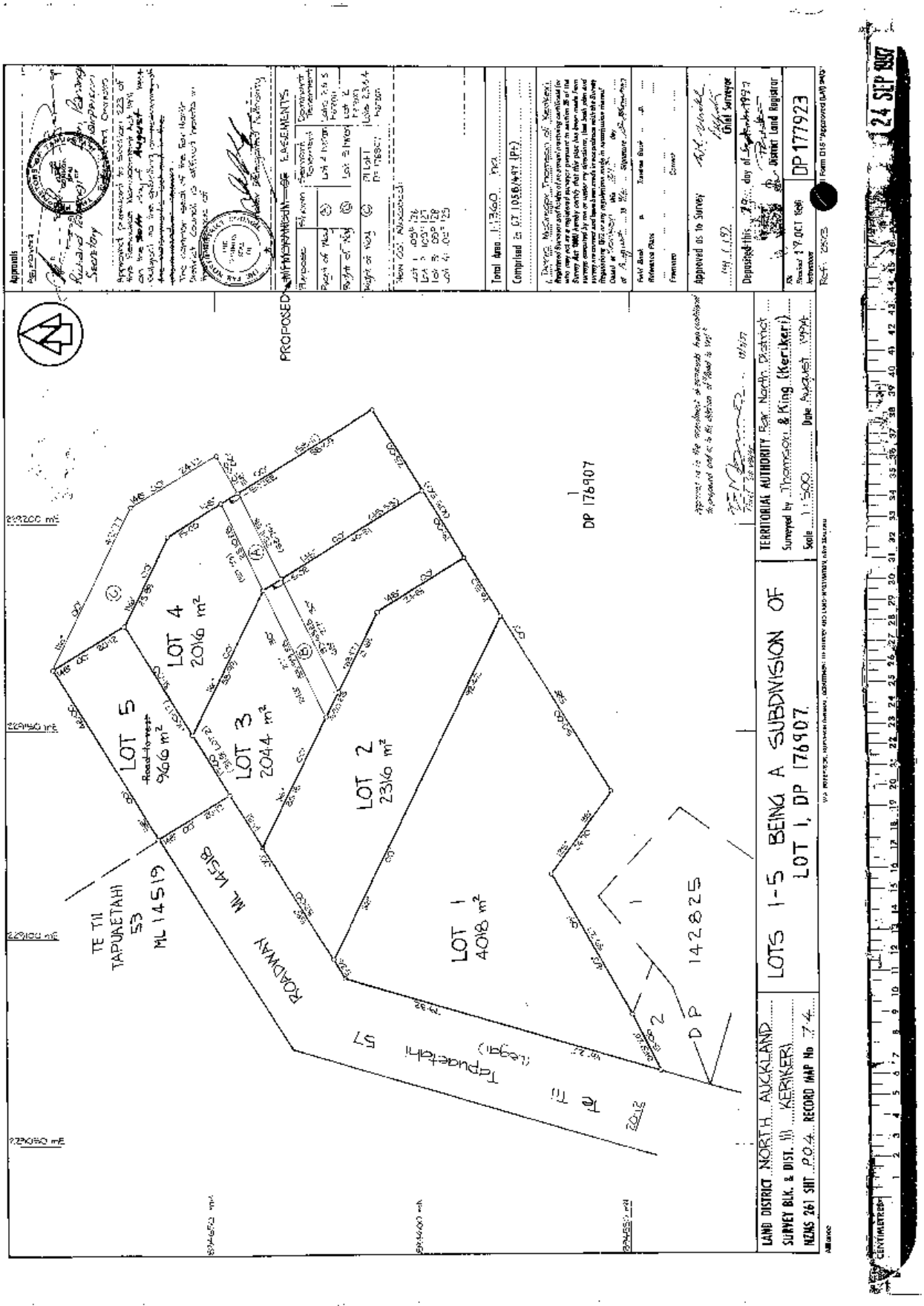
5456215.1 Gazette Notice pursuant to Section 338 (1) Te Ture Whenua Maori Act 1993 hereby sets apart (2.4000h) part Lot 2 DP 176907, as a Maori reservation for the purpose of a sports and recreation complex, to be known as Nga Mahi a Rehia Sports & Recreation Complex for the common use and benefit of the members of the Ngatirehia hapu - 13.1.2003 at 9:00 am

5456215.2 Gazette Notice pursuant to Section 338 (1) Te Ture Whenua Maori Act 1993 hereby sets apart (2.3176h) Lot 3 DP 176907, as a Maori reservation for the purpose of wahitapu, to be known as Te Ahirau Wahitapu for the common use and benefit of the members of the Ngatirehia hapu - 13.1.2003 at 9:00 am

5456215.3 Court Order vesting Lot 3 DP 176907 in Horomoana Herewini, Erehi Herewini, Ngawati Heihei, Pam Enoka, Heemi Epiha, Puawai Silich, Wiremu Papa Heihei, Leo Brown and Maia Edwards as trustees to hold and administer the same for the benefit of the beneficiaries named in the notice - 13.1.2003 at 9:00 am


New CT Allocated:
LOT 1 HEREON & LOTS 2&3 DP 176907
TOTAL CT AREA - 329.5158 ha
Parcel
Formerly
CT Ref
LOT 1
Pt LOT 1 DP 176907
Total Area: (Lot 1)
268.9032 ha
Approved for CT Diagram Purposes
Chief Surveyor
Deposited for CT Diagram Purposes
District Land Registrar
26 SEP 1997
DP 184896
PLAN OF LOT 1
FOR CT DIAGRAM PURPOSES
Land District: NORTH AUCKLAND
Survey District: Pt R IV KERIKERI
Local Authority: FAR NORTH DISTRICT
Prepared by: TERRALINK NZ LTD
Scale: Proportional
LOT 1
268.9032 Ha
LOT 2
(38.2950 ha)
DP 176907
LOT 3
(2.3176 ha)
DP 176906
PUREUA ROAD
MANGONUI INLET
TAUMAETAHI CREEK
ROADWAY
8 OCT 1997


PLAN OF LOTS 1-3
FOR CT DIAGRAM PURPOSES
DP 176907
Lot 1
270 0392 ha.
Lot 2
58 2950ha
Lot 3
2 3176 ha
PUREWA ROAD
Mangonui Inlet
Tapuaetahi Creek
TOTAL AREA (LOTS 1-3)
330 6518 ha
FAR NORTH DISTRICT
12 SEP 1996


LOT 5
966 m²
LOT 4
2016 m²
LOT 3
2044 m²
LOT 2
2316 m²
LOT 1
4018 m²
DP 178907
DP 142825
TE TII TAPUAETAHI 53 ML 14519
TAPUAETAHI 57 (legal)
ROADWAY ML 14519
LOTS 1-5 BEING A SUBDIVISION OF LOT 1, DP 178907
LAND DISTRICT NORTH AUCKLAND
SURVEY BLK. & DIST. KERIKERI
NZMS 261 SHT P04 RECORD MAP No 774
TERRITORIAL AUTHORITY Far North District
Surveyed by Thomson & King (Kerikeri)
Scale 1:500 Date August 1997
Approved as to Survey
Deposited this 19th day of September 1997
Issued 19 OCT 1998
DP 177923
24 SEP 1997
PROPOSED EASEMENTS
Total Area 1.1360 Hect.
Comprised in CT 1058/147 (Pt)
Ref: 2503

Report on Maori Land details for the following Record(s) of Title

Record(s) of Title

NA112A/909	Identified as potentially Maori Freehold Land

***** End of Report *****

14 TNTOK 976

Extract from *New Zealand Gazette*, 17/1/2002, No. 5, p. 151

Setting Apart Māori Freehold Land as a Māori Reservation

Pursuant to section 338 (1) of Te Ture Whenua Māori Act 1993, on the recommendation of the Māori Land Court, the Māori freehold land described in the Schedule hereto is hereby set apart as a Māori reservation for the purpose of a sports and recreation complex, to be known as Nga Mahi a Rehia Sports & Recreation Complex for the common use and benefit of the members of the Ngatirehia hapu.

Schedule

North Auckland Land District

Part of the land situated in Block III, Kerikeri Survey District and described as follows:

Area ha	Being
2.4000	Part of the land known as Te Tii Tapuaetahi, Lot 2, Deposited Plan 176907, being part of the land contained in certificate of title, Volume 112A, folio 909 (North Auckland Land Registry).

Dated at Wellington this 14th day of December 2001.

LEITH COMER, Chief Executive.

Ministry of Māori Development.

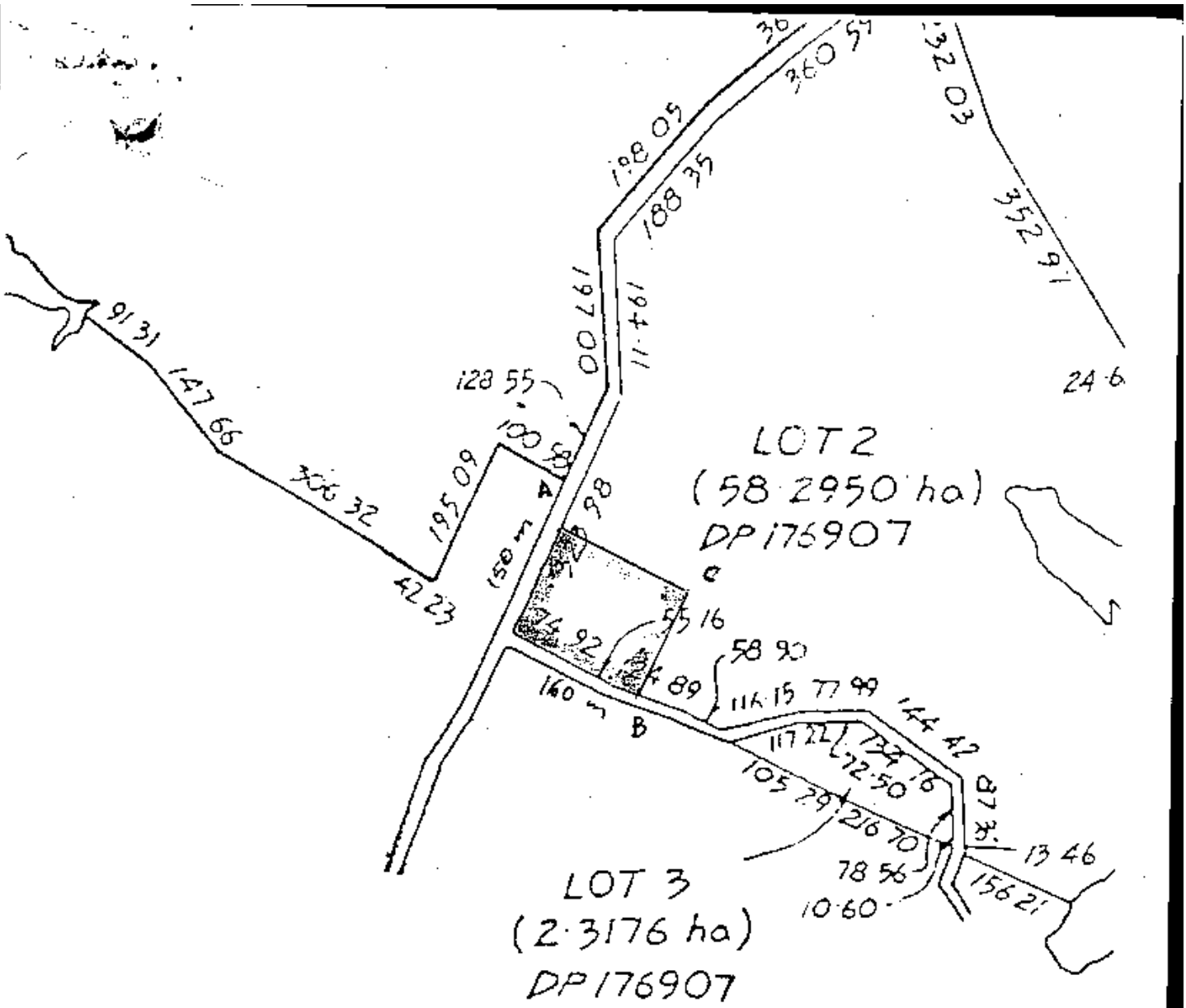
(MLC: H.O. 2/3/1/2; D.O. Appln. No. A20000055283)

ln368

DUPLICATE ISSUED IN TERMS OF RULE 67/1994

Dawn Paewhenua
Deputy Registrar
Māori Land Court
Te Tokerau

NOTICE NO: 368


LOT 2
(58·2950 ha)
DP 176907
LOT 3
(2·3176 ha)
DP 176907
A
B
C
150 m
91 31
147 66
306 32
195 09
42 23
128 55
100 58
197 00
11·461
198 05
188 35
360 57
132 03
352 91
24·6
98
74 92
53 16
58 90
114·15
77 99
144 42
117 22
12·50
105 79
216 70
78 56
10·60
156 21
13 46

1A TNTOK 975

Extract from *New Zealand Gazette*, 17/1/2002, No. 5, p. 151

Setting Apart Māori Freehold Land as a Māori Reservation

Pursuant to section 338 (1) of Te Ture Whenua Māori Act 1993, on the recommendation of the Māori Land Court, the Māori freehold land described in the Schedule hereto is hereby set apart as a Māori reservation for the purpose of wahitapu, to be known as Te Ahirau Wahitapu for the common use and benefit of the members of the Ngatirehia hapu.

Schedule

North Auckland Land District

Part of the land situated in Block III, Kerikeri Survey District and described as follows:

Area ha	Being
2.3176	Part of the land known as Te Tii Tapuaetahi, Lot 3, Deposited Plan 176907, being part of the land contained in certificate of title, Volume 112A, folio 909 (North Auckland Land Registry).

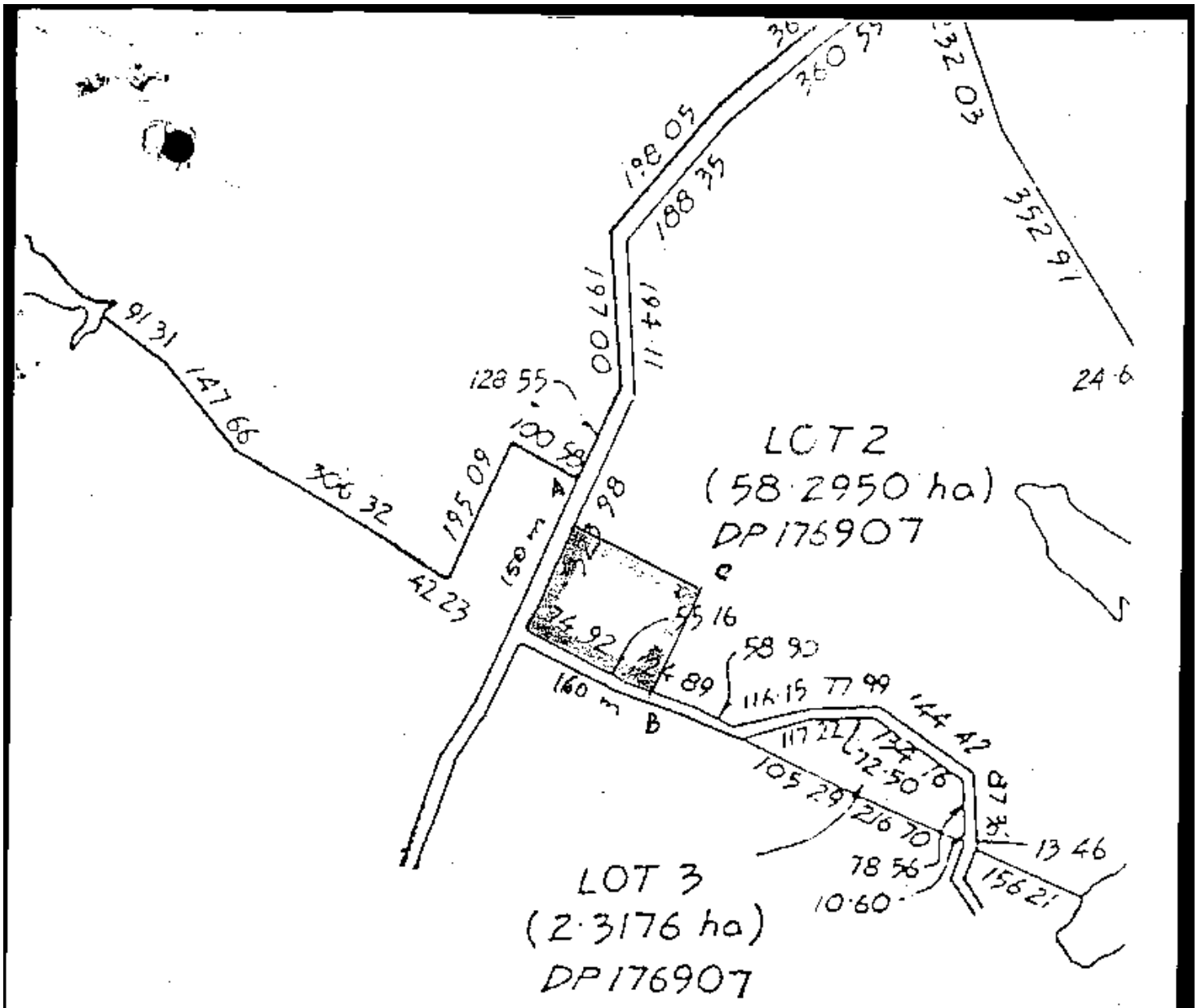
Dated at Wellington this 14th day of December 2001.

LEITH COMER, Chief Executive.

Ministry of Māori Development.

(MLC: H.O. 2/3/1/2; D.O. Appln. No. A20000057271)

NOTICE NO: 369


LOT 2
(58·2950 ha)
DP 176907
LOT 3
(2·3176 ha)
DP 176907
A
B
C
150 m
160 m
91 31
147 66
300 32
195 09
42 23
128 55
100 58
197 00
11·461
188 35
198 05
360 57
352 91
24·6
24 92
55 16
58 90
116·15
77 99
144 42
117 22
72·50
105 29
216 70
78 56
10·60
156 21
13 46

A20020001621

MB Ref: 31 KH 219-220

ORDER VESTING MAORI RESERVATION IN TRUSTEES

Te Ture Whenua Maori Act 1993
Section 338(7)

IN THE MAORI LAND COURT
OF NEW ZEALAND
TAITOKERAU DISTRICT

IN THE MATTER of part of the land known as **Te Tii Tapuaetahi being Lot 3 DP 176907 and being part of the land contained in Certificate of Title Volume 112A folio 909 North Auckland Land Registry**

At a sitting of the Court held at Kaikohe on 17 April 2002 before Andrew Duncan Spencer, Esquire, Judge

WHEREAS part of the land known as **Te Tii Tapuaetahi being Lot 3 DP 176907 and being part of the land contained in Certificate of Title Volume 112A folio 909 North Auckland Land Registry** was by notice in the New Zealand Gazette number 5 page 151 issued on 14 December 2001 was set apart as a Maori reservation for the purpose of a wahitapu known as Te Ahirau Wahitapu for the common use and benefit of the Ngatirehia hapu

AND WHEREAS application has been made to appoint trustees

NOW THEREFORE upon hearing such application it is hereby ordered pursuant to Section 338(7) of Te Ture Whenua Maori Act 1993 that the said land be and the same is hereby vested in

Horomona Herewini

Erehi Herewini

Ngawati Heihei

Pam Enoka

Heemi Epiha

Puawai Silich

Wiremu Papa Heihei

Leo Brown

Maia Edwards

as trustees to hold and administer the same for the benefit of the beneficiaries named in the said notice

AS WITNESS the hand of the Registrar and the Seal of the Court

THE MAORI LAND COURT OF NEW ZEALAND

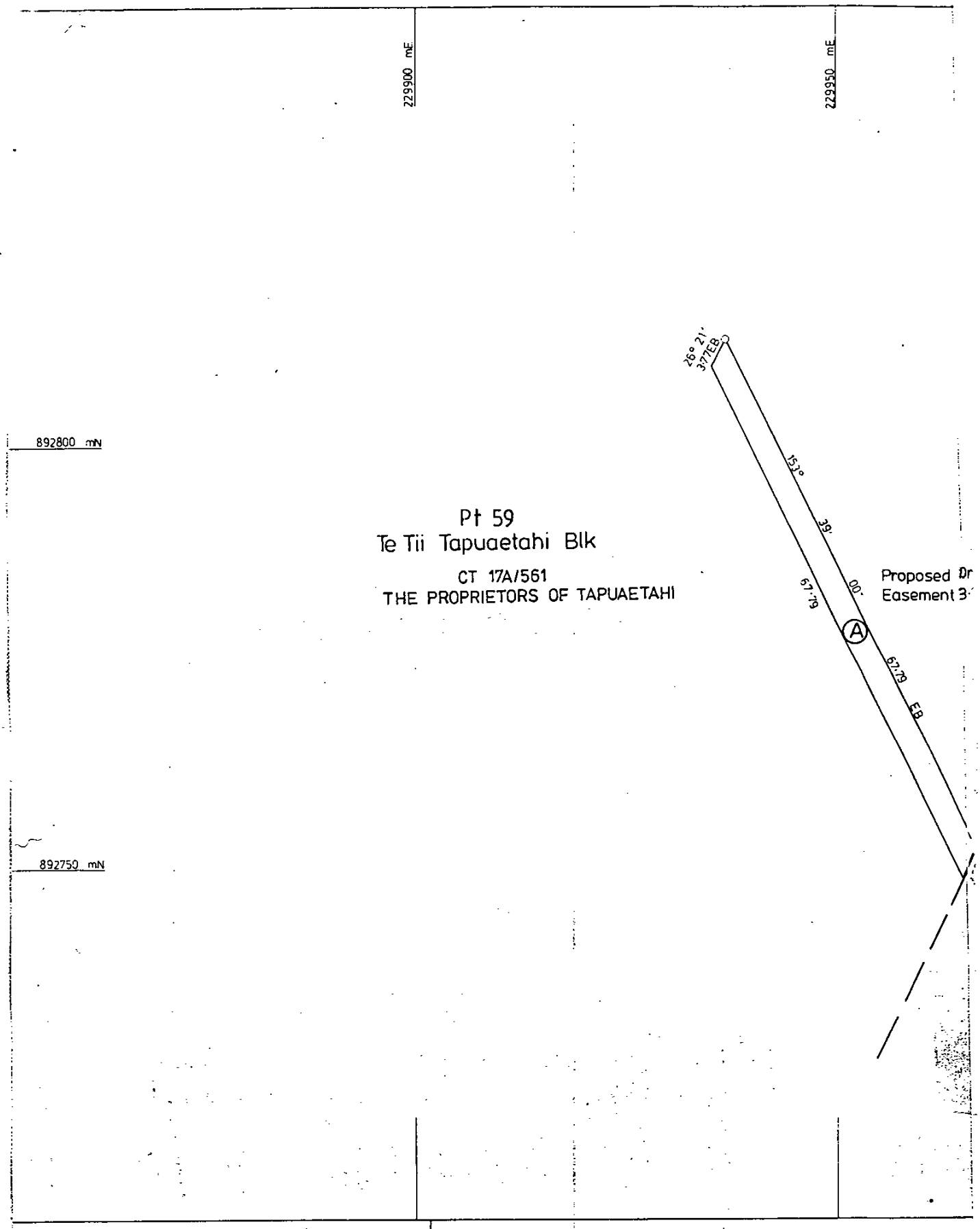
Registrar

Dawn Paewhenua
Deputy Registrar
Maori Land Court
Taitokerau

THE MAORI LAND COURT NEW ZEALAND

DUPLICATE
ISSUED IN TERMS
OF RULE 67/1994

B 868621.1 GN



LAND DISTRICT North Auckland
SURVEY BLK. & DIST. IV Kerikeri
NZMS 261 SHT RECORD MAP No PO4 7·4

Land Required For Drainage Ease

Drainage Easement Acquired for a State Primary School in Block IV, Kerikeri Survey District, Bay of Islands County

Pursuant to section 20 of the Public Works Act 1981, the Minister of Works and Development declares that, an agreement to that effect having been entered into, a drainage easement over the land described in the Second Schedule hereto, vesting in the Crown the rights contained in paragraph 5 of the Seventh Schedule to the Land Transfer Act 1952, is hereby acquired, subject to the conditions described in the First Schedule hereto, for a state primary school and shall vest in the Crown on the 26th day of November 1987.

First Schedule

North Auckland Land District

1. That all pipes to be laid in the earth shall be laid in such a manner that the highest point of the pipes shall be a minimum depth of 60 centimetres from the land surface along the length of the pipeline easement.

2. That the grantee, her servants, agents, engineers and workmen will, in exercising the rights, liberties and privileges as contained in paragraph 5 of the Seventh Schedule to the Land Transfer Act 1952, as granted by the grantor, cause as little disturbance as is reasonably possible to the surface of the land described in the Second Schedule hereto and shall at no cost to the grantor restore the said surface as nearly as possible to its former condition.

3. That the grantee shall be responsible for maintenance of the drainage pipeline within the area of the easement.

Second Schedule

North Auckland Land District

Land Over Which Easement is Acquired

All that piece of land containing 203 square metres, situated in Block IV, Kerikeri Survey District, being part No. 59 Te Tii Tapuaetahi Block; as shown marked "A" on S.O. Plan 61880, lodged in the office of the Chief Surveyor at Auckland.

Dated at Auckland this 5th day of November 1987.

R. J. SUTHERLAND,
for Minister of Works and Development.

(P.W. 33/2370; Ak. D.O. 50/23/109/0) 6/1
In971

PARTICULARS ENTERED IN REGISTER
LAND REGISTRY AUCKLAND
ASST. LAND REGISTRAR.....

17A/561

DISTRICT LAND REGISTRAR
NORTH AUCKLAND

C425585.1 MLCO

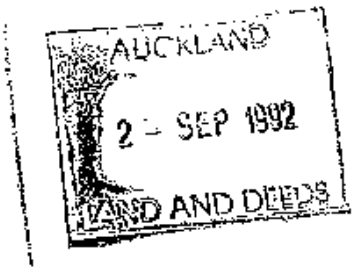
1033o/12

Checked 24/8/92
Entered 24/8/92

MB Ref: 73 WH 89

DETERMINATION OF STATUS OF LAND

The Maori Affairs Act 1953
Section 30(1)(i)



IN THE MAORI LAND COURT
OF NEW ZEALAND
TAITOKERAU DISTRICT

IN THE MATTER of the lands scheduled hereto

At a sitting of the Court held at Whangarei on 5 August 1992 before Andrew Duncan Spencer, Esquire, Judge

WHEREAS upon hearing evidence adduced in support of an application to determine the status of land and being satisfied on all matters on which it is by law required to be satisfied this Court DOTH HEREBY ORDER pursuant to the provisions of Section 30(1)(i) of the Maori Affairs Act 1953 that the lands scheduled hereto be and are hereby determined to be Maori freehold land.

AS WITNESS the hand of the Registrar and the Seal of the Court

THE MAORI LAND COURT OF NEW ZEALAND

Registrar

SCHEDULE

Te Tii Tapuaetahi 51 Certificate of Title Volume 17A folio 558
Te Tii Tapuaetahi 52 Certificate of Title Volume 17A folio 559
Te Tii Tapuaetahi 53 Certificate of Title Volume 17A folio 560
Te Tii Tapuaetahi 59 Certificate of Title Volume 17A folio 561
Tuhuna 12A1 Certificate of Title Volume 46C folio 965
Whatitiri 13B2A Certificate of Title Volume 24D folio 302

CERTIFIED A TRUE COPY
for DEPUTY REGISTRAR
31/8/92

5.00 28.OCT92 C 425585 1.

11.17 02.SARTICUDA ENTERED IN REGISTER
LAND REGISTRY DISTRICT AND

PARTICULARS LAND REGISTRY

AND REGISTER

[illegible]

147A/558 - 561 (inc)
116C/165
124D/302

4th/465

558
559
560
561
~~562~~

D110562.1 EC

Approved by the District Land Registrar, South Auckland No. 351560
Approved by the District Land Registrar, North Auckland, No. 4380/81
Approved by the Registrar-General of Land, Wellington, No. 436748.1/81

EASEMENT CERTIFICATE

IMPORTANT: Registration of this certificate does not of itself create any of the easements specified herein).

I/We THE PROPRIETORS OF TAPUAETAHI and
LEE BOSWELL and CAROL IONE BOSWELL

being the registered proprietor(s) of the land described in the Schedule hereto hereby certify that the easements specified in that Schedule, the servient tenements in relation to which are shown on a plan of survey deposited in the Land Registry Office at AUCKLAND
on the 2nd day of August 1995 under No. 142825
are the easements which it is intended shall be created by the operation of section 90A of the Land Transfer Act 1952.

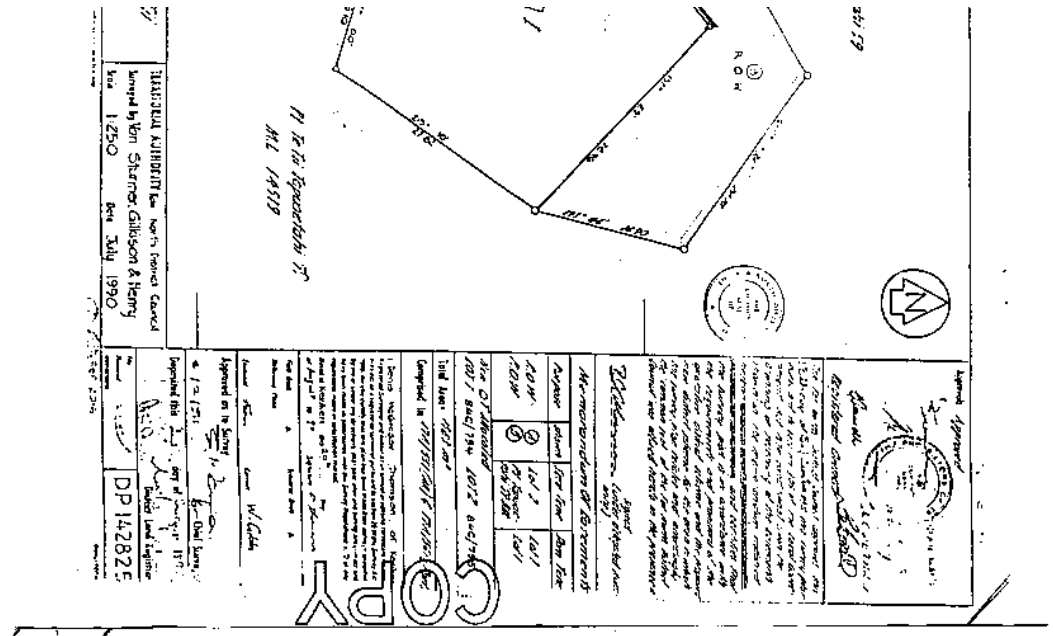
SCHEDULE

DEPOSITED PLAN NO. 142825

Nature of Easement (e.g., Right of Way, etc.)	Servient Tenement		Dominant Tenement Lot No.(s) or other Legal Description	Title Reference
	Lot No.(s) or other Legal Description	Colour, or Other Means of Identification, of Part Subject to Easement		
Right of Way	Lot 2 DP 142825	(A)	Lot 1 DP 142825	84C/794
~~Lot 2 DP 142825~~	~~(A) & (B)~~		~~Part Te Tii Tapuaetahi No 59~~	~~17A/561 (Residue)~~
17A/561	Part Te Tii Tapuaetahi No.59 Block	B	LOT 1	

State whether any rights or powers set out here are in addition to or in substitution for those set out in the Seventh Schedule to the Land Transfer Act 1952.

1. Rights and powers:



TE REP

MB Ref: 25 KH 48-49

COPY

ORDER GRANTING EASEMENT

Te Ture Whenua Maori Act 1993
Section 315

IN THE MAORI LAND COURT
OF NEW ZEALAND
TAITOKERAU DISTRICT

IN THE MATTER of the lands set out in the first schedule hereto

At a sitting of the Court held at Kaikohe on 9 October 1996 before Andrew Duncan Spencer, Esquire, Judge

WHEREAS application has been made by the PROPRIETORS OF TAPUAETAHI INCORPORATION for an easement as set out in the second schedule hereto

NOW THEREFORE the Court being satisfied as to all matters it is by law required to be satisfied DOTH HEREBY GRANT an easement to provide better access to the lands described in the first schedule hereto pursuant to Section 315 of Te Ture Whenua Maori Act 1993

THIS ORDER is subject to the conditions as to the formation and maintenance of the easement by the dominant tenement

AS WITNESS the hand of the Judge and the Seal of the Court

Judge

THE MAORI LAND COURT OF NEW ZEALAND

FIRST SCHEDULE

Lot 1 DP 142825 being part Te Tii Tapuaetahi 44 and being all the land contained in Certificate of Title 84C/794

Lot 1 DP176907 being the land contained in Certificate of Title 105B/497

SECOND SCHEDULE

An easement containing an area of 261m² commencing at the legal road and running in a north easterly direction being all the land in Certificate of Title 84C/795 and more particularly shown as Lot 2 on DP 142825

2. Terms, conditions, covenants, or restrictions in respect of any of the above easements:

The lessee for the time being of Lot 2 DP 142825 shall pay all costs associated with the formation and maintenance of the Right of Way

Dated this 25th day of October 1995.

Signed by the above-named PROPRIETORS OF TAPUAETAHI by the affixing of its common seal pursuant to a Resolution passed 25 October 1966 authorising the affising of the common seal in the presence of the Chairman and the Secretary

THE PROPRIETORS OF TAPUAETAHI
THE COMMON SEAL OF

Chairman

Secretary

SIGNED by LEE BOSWELL and CAROL IONE BOSWELL as Lessees in the presence of:

Legal Executive to
LAW NORTH PARTNERS
Barristers & Solicitors,
KERIKERI.

EASEMENT CERTIFICATE

(IMPORTANT): Registration of this certificate does not of itself create any of the easements specified herein.

Correct for the purposes of the Land Transfer Act

Solicitor for the registered proprietor

2.55 23 JAN 95 D 924749
PARTICULARS ENTERED IN REGISTER
LAND REGISTRY
AUCKLAND
ASST LAND REGISTRAR

2.10 20.FEB97 D 110662
PARTICULARS ENTERED IN REGISTER
LAND REGISTRY NORTH AUCKLAND
ASST LAND REGISTRAR

84C/774 North Auckland 1058/47

DISTRICT LAND REGISTRAR NORTH AUCKLAND NEW ZEALAND

TE:REP

MB Ref: 25 KH 137-139

D178367.1 CO

ORDER GRANTING EASEMENTS OVER MAORI FREEHOLD LAND

Te Ture Whenua Maori Act 1993
Section 315

IN THE MAORI LAND COURT
OF NEW ZEALAND
TAITOKERAU DISTRICT

IN THE MATTER of the lands set out in the first schedule hereto

At a sitting of the Court held at Kaikohe on 30 January 1997 before Andrew Duncan Spencer, Esquire, Judge

WHEREAS application has been made by the PROPRIETORS OF TAPUAETAHI INCORPORATION for easements affecting the lands set out in the first schedule hereto

AND WHEREAS the NATIONAL BANK OF NEW ZEALAND LTD and the HOUSING CORPORATION OF NEW ZEALAND LTD mortgagees of the land contained in Certificate of Title 105B/497 have consented to the said easements

NOW THEREFORE the Court acting in pursuance of the powers vested in it under Section 315 of Te Ture Whenua Maori Act 1993 and being satisfied as to all things it is by law required to be satisfied DOTH HEREBY GRANT the easements set out in the second schedule hereto

AS WITNESS the hand of the Judge and the Seal of the Court

Judge

THE MAORI LAND COURT OF NEW ZEALAND

Duplicate Copy

Deputy Registrar

Signed: A D Spencer
Judge

FIRST SCHEDULE

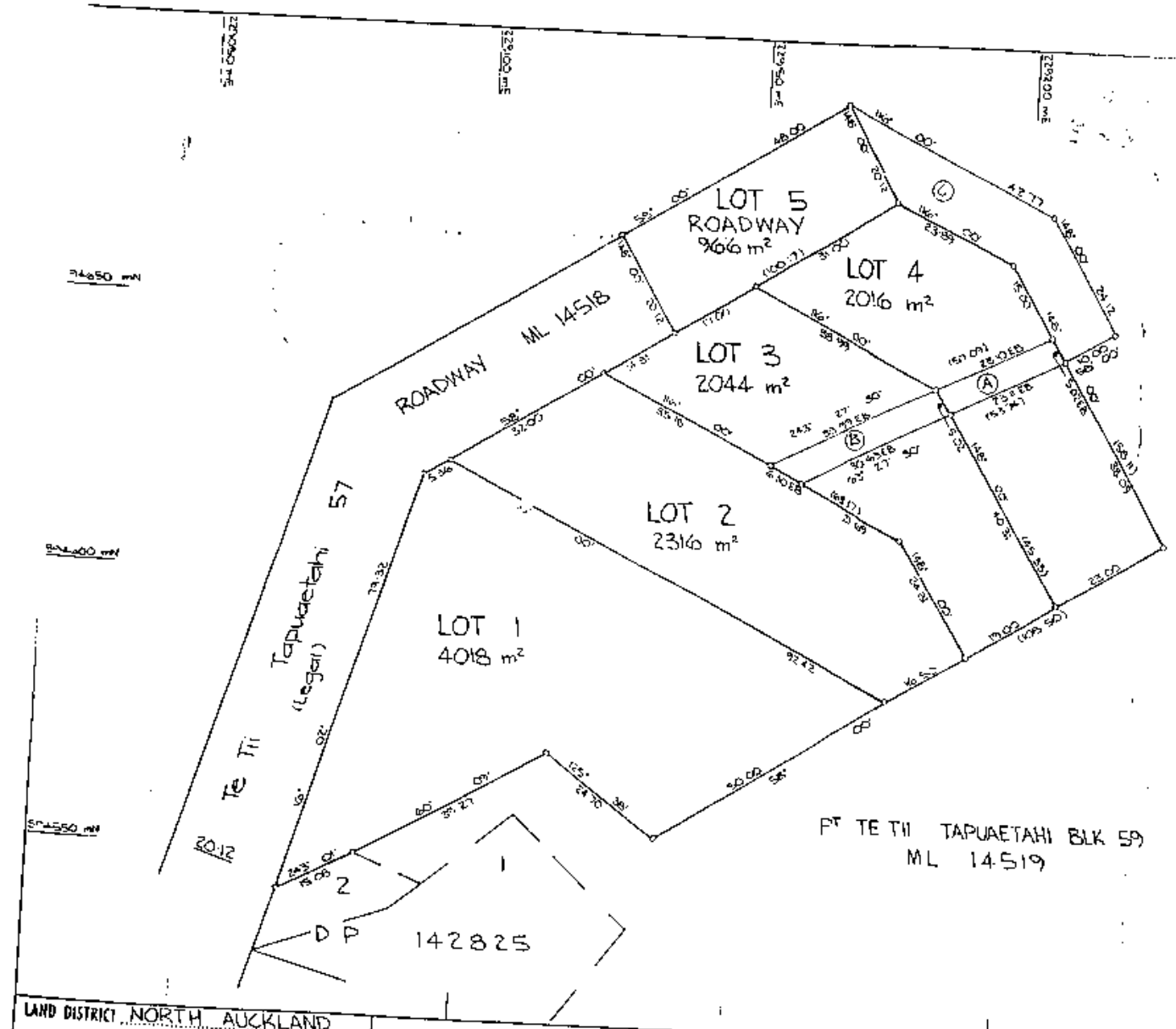
Land	Title	Area
Lot 2 DP 177923 being part Lot 1 DP 176907 and being part Te Tii Tapuaetahi 59	Certificate of Title 1090/27	2316 m²
Lot 3 DP 177923 being part Lot 1 DP 176907 and being part Te Tii Tapuaetahi 59	Certificate of Title 1090/28	2044 m²
Lot 4 DP 177923 being part Lot 1 DP 176907 and being part Te Tii Tapuaetahi 59	Certificate of Title 1090/29	2016 m²
Lot 1 DP 176907 being part Te Tii Tapuaetahi 59	Certificate of Title ~~105B/497~~ 112A/409	270.0392 ha

SECOND SCHEDULE

1 A right of way easement in favour of Lot 2 DP 177923 the dominant tenement over Lots 3 and 4 DP 177923 and Lot 1 DP 176907 being parts Te Tii Tapuaetahi 59 the servient tenements marked B, A and C on plan.

2 A right of way easement in favour of Lot 3 DP 177923 the dominant tenement over Lot 4 DP 177923 and Lot 1 DP 176907 being parts Te Tii Tapuaetahi 59 the servient tenements marked A and C on plan.

3 A right of way easement in favour of Lot 4 DP 177923 the dominant tenement over Lot 1 DP 176907 being part Te Tii Tapuaetahi 59 the servient tenement marked C on plan.



Approvals

Approved

Richard [illegible]
Secretary

Approved pursuant to Section 223 of the Resource Management Act 1991 on the 26th day of August 1994
Subject to the granting or reserving of the easements set out in the memorandum hereon
The common seal of the Far North District Council is affixed hereto in the presence of

[illegible]
Duly Delegated Authority

MEMORANDUM OF EASEMENTS

Purpose	Shown	Servient Tenement	Dominant Tenement
Right of Way	(A)	Lot 4	Lots 2&3
Right of Way	(B)	Lot 3	Lot 2
Right of Way	(C)	Blk 59, ML 14519	Lots 2,3&4

Non Cost Allocated.
Lot 1:
Lot 2:
Lot 3
Lot 4.

Total Area 1.1860 ha

Comprised in CT 17A/561 (Part)

I, Dennis MacGregor Thomson of Kerikeri Registered Surveyor and holder of an annual practising certificate (who may act as a registered surveyor pursuant to section 28 of the Survey Act 1986) hereby certify that this plan has been made from surveys executed by me or under my directions, that both plan and survey are correct and have been made in accordance with the Survey Regulations 1972 or any regulations made in substitution thereof.
Dated at Kerikeri this 24th day of August 1994
Signature [illegible]

Field Book [illegible] Traverse Book [illegible]
Reference Plans
Examined Correct

Approved as to Survey
[illegible]
Chief Surveyor

Deposited this [illegible] day of [illegible] 19[illegible]
District Land Registrar

Received 17 OCT '96
DP 177923

Ref: 2328

Deeds Form 018 "Approved (LM) 84/2"

LAND DISTRICT NORTH AUCKLAND
SURVEY BLK. & DIST. III KERIKERI
NZMS 261 SHT P04 RECORD MAP No 7-4

LOTS 1-5 BEING A SUBDIVISION OF PT TE TII TAPUAETAHI 59 BLK, ML 14519

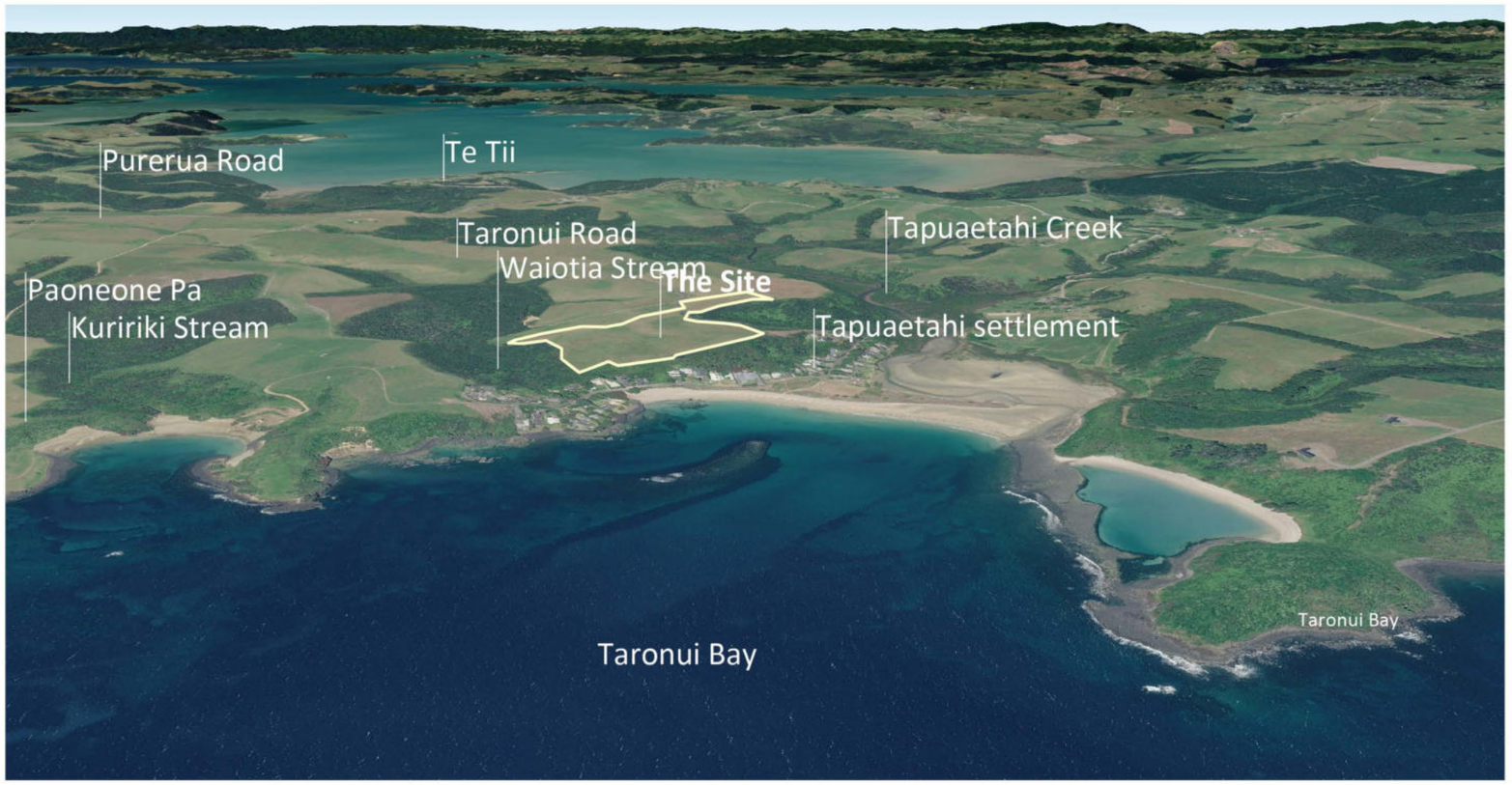
TERRITORIAL AUTHORITY Far North District
Surveyed by Thomson Gilkeson & King
Scale 1:500 Date August 1994

D178367.1 C6

Produced 9.00 04.AUG97 D 178367
entered 9.00 19 Sept 97

PARTICULARS ENTERED IN REGISTER
LAND REGISTRY NORTH AUCKLAND
ASST LAND REGISTRAR

PREPARED FOR TAPUAETAHI INCORPORATION



LANDSCAPE INTEGRATION CONCEPT

TAPUAETAHI SUBDIVISION
RC APPLICATION 2026

Ref: 1348_LIC_20260316

LITTORALIS
LANDSCAPE ARCHITECTURE

Note: Design contours shown at 0.5m intervals, prepared by Vision Consulting Engineers Ltd. For geothechnical site analysis and storm/waste water design refer to documentation by Vision Consulting Engineers Ltd.

Margin of coastal flank vegetation, initiate long-term weed management. Progressively replace weed species with indigenous, coastal species.

Approx. position of existing tsunami siren

OH power

Tarranui Road

Planting atop fill mound up to 3m high

Indicative fence along northern edge of farm/quarry track

GENERAL COASTAL ZONE
COASTAL LIVING ZONE

Legend

- Proposed new lot boundaries
- Proposed building envelope
- Indicative building shown 200m²
  Single storey
  Maximum height 5m
- Indicative building shown
  Two storey/stepped
  Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas
- (1) Secure boat compound
  15 covered storage spaces
  8 uncovered storage spaces
- (2) Automatic sliding gate
- (3) Secondary waste water treatment plant
- (4) Storage sheds for dinghies, kayaks and beach equipment
- (5) Indicative walking track route
- (6) Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high
- Low indigenous planting up to 1.5m high

Note: Only low flammability shrub and tree species within 10m of building areas.

Scale @A3	Project No.	Drawing No.	Rev	Client
1 : 2000	1374	LLA002	A	TAPUAETAHI INCORPORATION

0 25 50 m

Date: 16/03/2026

Project Title: **TAPUAETAHI SUBDIVISION RC APPLICATION 2026**

Title: **LANDSCAPE INTEGRATION CONCEPT**

Sheet Title: **OVERALL SITE PLAN**

CAD REF.: 1371_Tapuaetahi_20251210.vwx

LITTORALIS LANDSCAPE ARCHITECTURE

Legend

- Proposed building envelope
- Indicative building shown 200m² Single storey Maximum height 5m
- Indicative building shown Two storey/stepped Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas

1. Secure boat compound See following sheet
2. Automatic sliding gate
3. Secondary waste water treatment plant
4. Storage sheds for dinghies, kayaks and beach equipment
5. Indicative walking track route
6. Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high

Scale @A3	Project No.	Drawing No.	Rev
1 : 1000	1374	LLA003	A

0 25 50 m

Date 16/03/2026

CAD REF.: 1371_Tapuaetahi_20251210.vwx

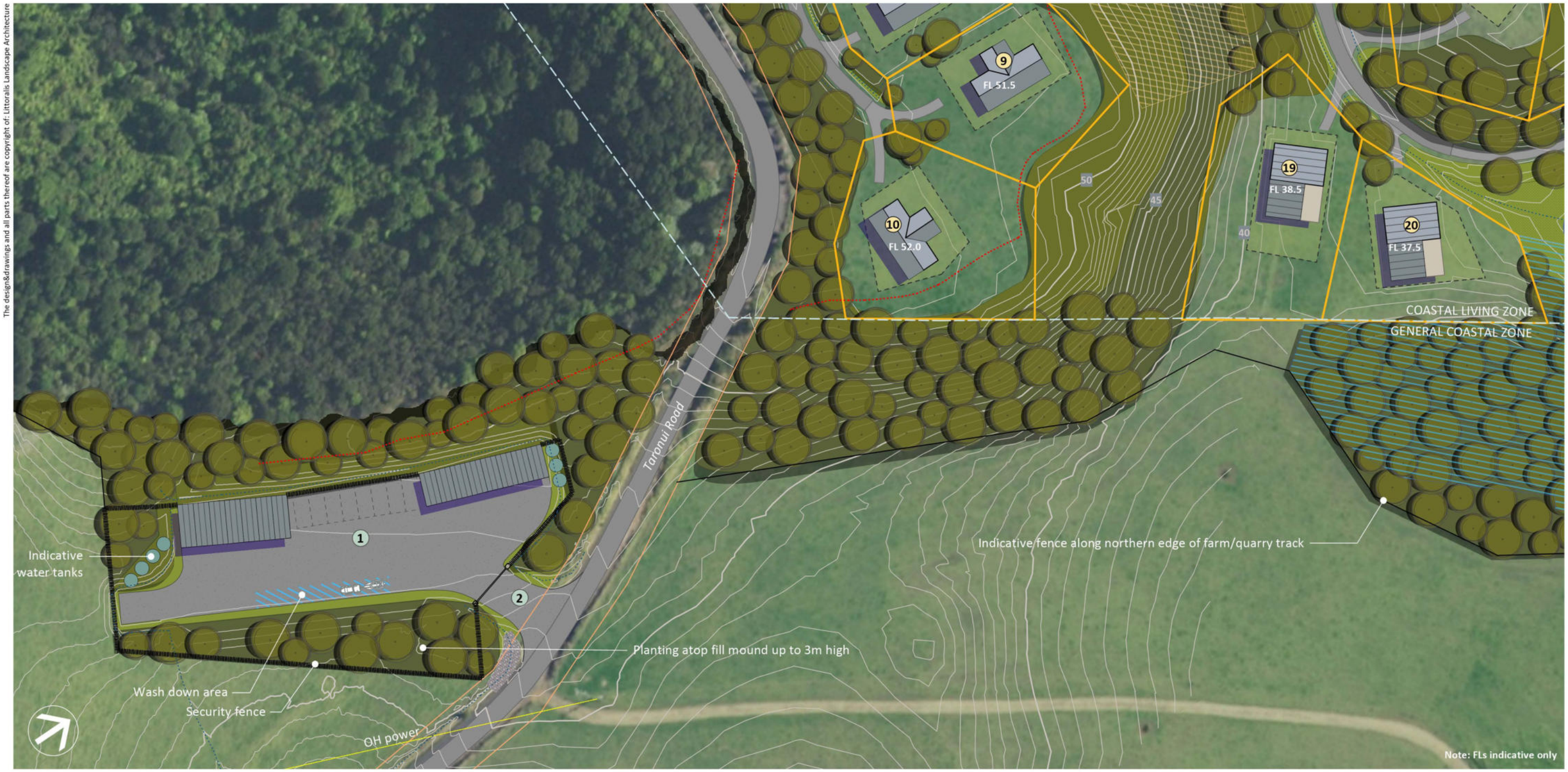
Client
TAPUAETAHI INCORPORATION

Project Title
TAPUAETAHI SUBDIVISION RC APPLICATION 2026

Title
LANDSCAPE INTEGRATION CONCEPT

Sheet Title
DETAILED SITE PLAN 1

LITTORALIS LANDSCAPE ARCHITECTURE



Legend

- Proposed building envelope
- Indicative building shown 200m² Single storey Maximum height 5m
- Indicative building shown Two storey/stepped Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas
- (1) Secure boat compound 15 covered storage spaces 8 uncovered storage spaces
- (2) Automatic sliding gate
- (3) Secondary waste water treatment plant
- (4) Storage sheds for dinghies, kayaks and beach equipment
- (5) Indicative walking track route
- (6) Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high

Scale @A3	Project No.	Drawing No.	Rev	Date
1 : 500	1374	LLA004	A	16/03/2026

0 25 50 m

CAD REF.: 1371_Tapuaetahi_20251210.vwx

Client: **TAPUAETAHI INCORPORATION**

Project Title: **TAPUAETAHI SUBDIVISION RC APPLICATION 2026**

Title: **LANDSCAPE INTEGRATION CONCEPT**

Sheet Title: **DETAILED SITE PLAN 2**

LITTORALIS LANDSCAPE ARCHITECTURE

Proposed staging

- Proposed lot boundaries
- **Stage 1**: Lots 1, 2, 3
- **Stage 2**: Lots 7, 8, 9, 10
- **Stage 3**: Lots 4, 5, 6, 11, 12, 15 and formation of the stormwater pond
- **Stage 4**: Lots 13, 16, 17, 19, 20
- **Stage 5**: Lots 14, 18
- **Stage 6**: Boat storage compound

Scale @A3	Project No.	Drawing No.	Rev	Client
as shown	1374	LLA005	A	TAPUAETAHI INCORPORATION

0 25 50 m

Date: 16/03/2026

CAD REF.: 1371_Tapuaetahi_20251210.vwx

Project Title: **TAPUAETAHI SUBDIVISION RC APPLICATION 2026**

Title: **LANDSCAPE INTEGRATION CONCEPT**

Sheet Title: **STAGING PLAN**

LITTORALIS LANDSCAPE ARCHITECTURE

SITE SUITABILITY REPORT

Tapuaetahi Development

Prepared for

Tapuaetahi Incorporation

18/03/2026

Report Information Summary

Job no.	J15724
Report Author	Harry Miller/Callum Smith
Report Reviewer	Ben Perry/Dan Simmonds
Version No.	4
Status	Final
Date	18/03/2026

Version No.	Date	Description
1	05/09/2025	Draft issued to Client
2	25/09/2025	Draft issued to FNDC
3	9/03/2026	Final issued to Client
4	18/03/2026	Final issued to FNDC

Document Acceptance

Action	Name	Signed		Date
Author	Harry Miller/ Callum Smith	Engineering Geologist, BSci (Geo)	Intermediate Engineer, BEng (Hons)	18/03/2026
Reviewer	Dan Simmonds	Senior Geotechnical Engineer, MIEAust CPEng, CMEngNZ		18/03/2026
Reviewer	Ben Perry	Managing Director, CMEngNZ CPEng		18/03/2026

Limitations

This report has been prepared by Vision Consulting Engineers Limited (VISION) based on the scope of our engagement. It is solely for our Client's use for the purpose for which it is intended in accordance with the agreed scope of work. VISION does not accept any liability or responsibility in relation to the use of this report contrary to the above, or to any person other than the Client. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate, without independent verification, unless otherwise indicated. No liability or responsibility is accepted by VISION for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.

The nature and continuity of the subsurface materials are inferred and it must be appreciated that actual conditions could vary from that described herein.

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1 Introduction

Vision Consulting Engineers Limited (VISION) has been engaged by the Tapuaetahi Incorporation (the "Client") to assess the suitability of their land for a proposed subdivision at Tapuaetahi. The Incorporation plans to create 20 proposed allotments on Lot 1 DP184896, each with a dwelling, services and associated amenities. The remaining land will include accessways and a boat yard with boat storage buildings.

VISION completed a Stage 1 high-level engineering assessment of the proposed development (reference J15724, dated 10/12/2024 and worked in collaboration with the project team (Client, landscape architect, traffic engineer and planner) to enable the development of a final scheme plan for which a Resource Consent is to be sort.

The proposed final subdivision is shown on the Littoralis Site Plan. The site plan depicts that a right of way provides access to the new lots from Taronui Road, with 20 new dwellings proposed. From discussions with the Client and project team, it is understood that each new dwelling is to be on its own lot, with the right of way located on the balance lot, along with a centralized onsite wastewater system. In addition, a boat yard is proposed on the western side of Taronui Road.

This Stage 2 report presents the findings of the site suitability assessment, which includes;

- Working collaboratively with the Client, project team and the Far North District Council (FNDC) in an adaptive planning process.
- Provide a site suitability report that includes a feasibility geotechnical assessment to support the Resource Consent

Following further collaborative planning, the delivery strategy for the project has been updated to incorporate a phased construction approach. The development will be executed across six distinct stages. This staging strategy is designed to optimise the site's engineering logistics, by maintaining an efficient cut-to-fill earthworks balance to avoid site-wide bulk earthworks.

The proposed staging sequence is defined as follows:

- **Stage 1:** Lots 1, 2, and 3
- **Stage 2:** Lots 7, 8, 9, and 10
- **Stage 3:** Lots 4, 5, 6, 11, 12, 15 and formation of stormwater pond
- **Stage 4:** Lots 13, 16, 17, 19, and 20
- **Stage 5:** Lots 14 and 18
- **Stage 6:** The Boat Storage Yard Area

Specific engineering justifications and details regarding the progressive construction of internal accessways, stormwater controls, and wastewater infrastructure across these stages are outlined in the respective sections of this addendum.

1.1 Objective

The project objective of Stage 2 is to work collaboratively with the Client and project team and to provide a site suitability report that includes a geotechnical feasibility assessment, wastewater feasibility assessment and access feasibility design to support a Resource Consent application for the proposed subdivision.

It is understood that Engineering Outcomes Ltd is providing traffic specialist input regarding proposed and existing intersections and any recommendations for Taronui Road and the Internal Accessways.

2 Scope of Work

2.1 Scope and Exclusions

The following scope of work is proposed:

- Familiarisation with information regarding the proposed development provided by the Client and project team
- Site walkover assessment to assess the presence of engineering constraints identified as part of the high level assessment.
- Assess natural hazards in the requirements of Rule 13.7.3.2 of the Operative District Plan.
- Onsite Wastewater Feasibility Assessment
  - Desktop Study of the site, including an assessment of site constraints for onsite wastewater disposal and identify possible location of a treatment plant and disposal field.
  - Provide preliminary wastewater plan to Client and project team for comment/approval.
  - Site walkover and intrusive testing to assess soil type (5 hand auger boreholes to a maximum depth of 1.2m or refusal)
  - Assessment of environmental site constraints and applicable systems
  - Concept design to demonstrate feasibility (analysis of field logs, calculations, design)
  - Preparation of onsite wastewater feasibility plan
  - Onsite wastewater disposal reporting
- Internal Access Feasibility Assessment
  - Assess requirements for internal access ways in accordance with the FNDC ES 2009 and the operative District Plan.
  - Assess stormwater management for internal access ways.
  - Carry out concept design of proposed internal access way using topographic survey data and NRC LiDAR.
  - Preparation of concept level drawings
- Boat Storage Feasibility Assessment
  - Assess requirements for boat storage area and manoeuvring in accordance with the FNDC ES 2009.
  - Assess stormwater management for boat storage area.
  - Carry out concept design of proposed boat storage using NRC LiDAR.
  - Preparation of concept level drawings:
- Geotechnical Feasibility Assessment
  - Familiarisation with information provided by the Client
  - Desk Study: Review published and unpublished information about the site
  - Geomorphologic assessment of the property, including a review of historic aerial images and LiDAR data.
  - Site walkover, visual inspection of the site and surrounding environs to assess geomorphology and any geotechnical hazards that may exist or have potential to exist.
  - Intrusive testing to assess ground conditions present at the site. This is to includes 7 hand augered boreholes to a maximum depth of 5.0m bgl or refusal.

  - Geotechnical feasibility assessment reporting providing the findings of our visual assessment including site observations, subsurface conditions and preliminary geotechnical recommendations.
- Assess stormwater for individual residential lots and the boat yard
- Preparation of site suitability report presenting our assessment addressing stormwater, wastewater, vehicle access, earthworks, natural hazards, feasibility geotechnical assessment and water supply (including firefighting).

3 Industry Guidance

This report has been prepared, as agreed with our Client, in general accordance with the requirements of the FNDC ES 2009 and with reference to the District Plan; Section 106 of the Resource Management Act (RMA).

4 Property Description and Details

The property is legally described as Lot 2-3 Deposited Plan 176907, Lot 5 Deposited Plan 177923 and Lot 1 Deposited Plan 184896 and is 3,296,124 m^2 or 329 hectares (ha) in area.

The property is located on the Purerua Peninsula and extends from the Te Puna Inlet to the south-east and Tapuaetahi Beach to the north-west, with Tapuaetahi Creek located along part of the western property boundary. Purerua Road passes through the property along with Taronui Road that provides access to the existing dwellings that are located to the north-west of the subject property. The property contains the Kopupu Stream, Waiotai Stream and the Kuririki Stream. The location of the property is presented in Figure 1.

The property is currently undeveloped and is generally covered in pasture with bush present within gully features associated with the streams. The topography of the property varies from flat to gently sloping land to areas that are moderately to steeply sloping.

For the purpose of this assessment, the 'development site' is limited to the north-western portion of the property as shown by the yellow box in Figure 1. The 'boat storage site' is limited to the western portion of the site shown by the green box in Figure 1.

Basic details of the property are provided in Table 1.

Table 1. Property Details
Data relating to this site

Item	Details
Territorial Authority	Far North District Council
Site Address	N/A
Legal Description	Lot 2-3 Deposited Plan 176907, Lot 5 Deposited Plan 177923 and Lot 1 Deposited Plan 184896
Area	3,296,124 m2
Operative DP Zoning	Coastal Living (Development Site), General Coastal (Boat Shed Site)
Proposed DP Zoning	Māori Purpose - Rural

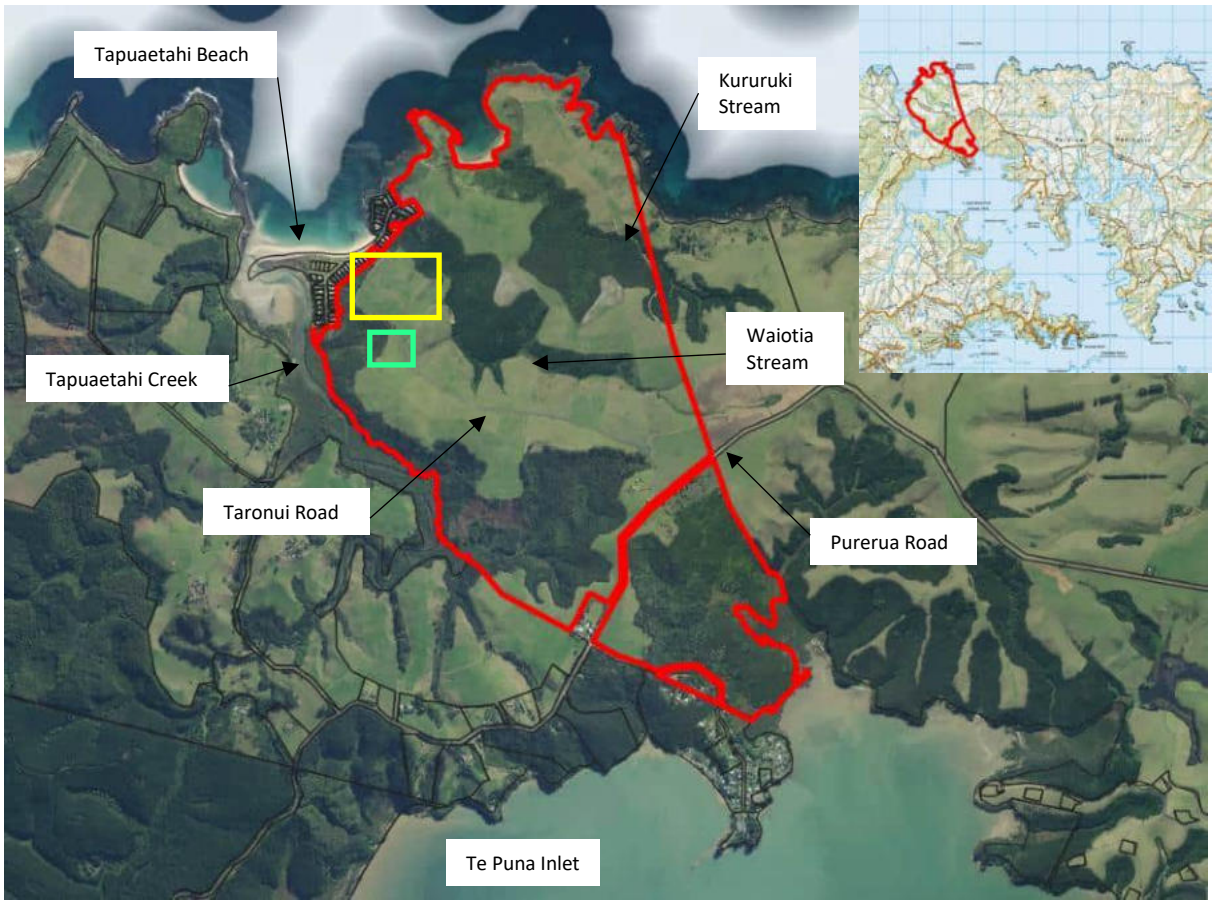


Figure 1. Property and site locations

The property is highlighted red, the 'development site' is outlined in yellow, the 'boat shed site' is outlined in green, north to top of page, boundary approximate only, image from LINZ.

4.1 Proposed Development

It is understood that the Client wishes to subdivide the property to create 20 lots, with each lot to contain a dwelling and amenities. The balance lot is to contain the right of way access to the new lots and a boat storage yard is also proposed.

The proposed development is to have a decentralised on-site wastewater management system that is being explored by the Incorporation at the time of preparing this report. This is discussed further in the Wastewater Section of this report.

The subdivision site plan is provided in Appendix A and is presented below in Figure 2.

The physical works for the subdivision will be delivered in six distinct stages as shown in Figure 3:

- **Stage 1:** Lots 1, 2, and 3
- **Stage 2:** Lots 7, 8, 9, and 10
- **Stage 3:** Lots 4, 5, 6, 11, 12, and 15 and formation of stormwater pond
- **Stage 4:** Lots 13, 16, 17, 19, and 20
- **Stage 5:** Lots 14 and 18
- **Stage 6:** The Boat Storage Yard

The proposed development is to have a decentralised on-site wastewater management system that is being explored by the Incorporation at the time of preparing this report. This system, along with the internal roading, stormwater attenuation, and open drains, will be constructed in a phased approach to align with the delivery of the lots. The specific engineering justifications, roadway chainages, and

infrastructure rollout for each stage are discussed further in the relevant technical sections (Sections 9 through 12) of this report.

Figure 2. Proposed Site Plan

Site Plan is provided by Littoralis

Figure 3. Proposed Construction Staging Plan

Concept civil design plan illustrating the phased delivery of the Tapuaetahi development across six distinct stages, including lot sequencing, roadway extensions, and the boat storage yard, Site Plan is provided by Littoralis.

5 Desktop Study

5.1 Geology

The 1:250,000 geological map, Geology of the Whangarei Area (Ebrooke and Brook et al 2009) indicates that the property is underlain by the Waipapa Group comprising massive to thin bedded, lithic volcaniclastic metasandstone and argillite, with tectonically enclosed basalt, chert and siliceous argillite and the Kerikeri Volcanic Group comprising basalt lava, volcanic plugs and minor tuff.

Based on the geomorphology, the site is anticipated to be underlain by the Kerikeri Volcanic Group, which is in turn underlain by the Waipapa Group.

Landcare Research (Harmsworth, 1996) have mapped the property as being underlain by Okaihau gravelly friable clay being soils of the rolling and hilly land, well to moderately well drained, Otaha clay being soils of the rolling and hilly land, imperfectly to very poorly drained, Otaha gravelly clay loam being soils of the rolling and hilly land, imperfectly to very poorly drained, Rangiora clay, clay loam and silty clay loam being soils of the rolling and hilly land, imperfectly to very poorly drained, and Pungaere gravelly friable clay being soils of the rolling and hilly land, well to moderately well drained.

5.2 Historic Aerial Images

Historic aerial images of the property from 1950 and 1980 were obtained from Retrolens, and the 1950 images were reviewed as stereopairs.

The historic aerial image from 1950 is presented in Figure 4. In the image, the area surrounding the site is undeveloped, with some loosely formed access tracks present.

By 1980 (Figure 5), Taronui Road had been constructed, along with dwellings located to the north-west of the subject property. Trees/vegetation are also present on part of the property.

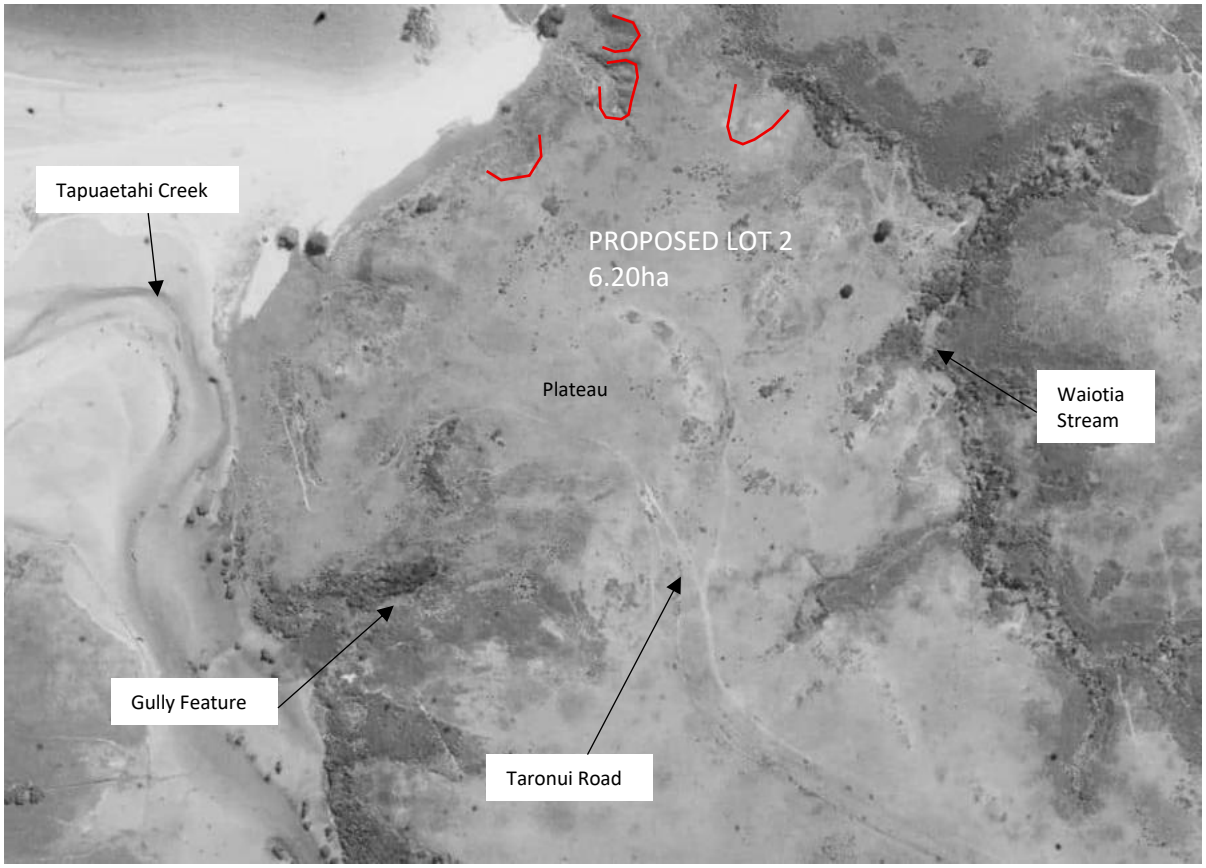


Figure 4. Retrolens 1950 Aerial Image

North at top of page, approximate location of historic headscarps marked in red, historic aerial image from Retrolens.

Figure 5. Retrolens 1980 Aerial Image
North at top of page, historic aerial image from Retrolens.

Historic landslips seen in the 1950's stereo pairs extend down from relatively flat plateau towards the Waiotai Stream, Tapauetahi Beach and a gully feature extends down to the Tapuaetahi Creek. The historic landslip features observed in the 1950 aerial image show no signs of further movement when compared with the 1980 historic aerial image.

5.3 Geomorphology

The development site is generally located on a flat to gently sloping plateau that is present on a north-west trending spur ridge.

To the north and east of the plateau the land generally slopes between 5 and 10 degrees with slopes up to 22 degrees located to the east of the plateau. The central portion of the site slopes between 0 and 3 degrees with isolated hill features present with slopes ranging between 8 and 12 degrees. Slopes are present to the north-west and north of the site that slope between 20 and 35 degrees down towards Tapuaetahi beach and Waiotaia Stream. To the south and west of the plateau, the land slopes between 20 and 35 degrees to a gully feature that extends to the Tauaetahi Creek.

The boat storage site is located near the head of a gully feature that extends down to Tapuaetahi creek. The site generally slopes between 1 and 6 degrees to the south-east. The gully feature present to the north-west slopes between 20 and 35 degrees.

The geomorphology of the area is shown in Figure 6 below using a digital elevation model derived from the 2018 NRC LiDAR dataset and 1m contours.

The geomorphology of the development site observed in the historic aerial image from 1950 is considered to be relatively consistent with the geomorphology presented in Figure 6. Site observations are shown in Figure 6.

Earthworks associated with Taronui Road appear to include fill material pushed out downslope to form the road.

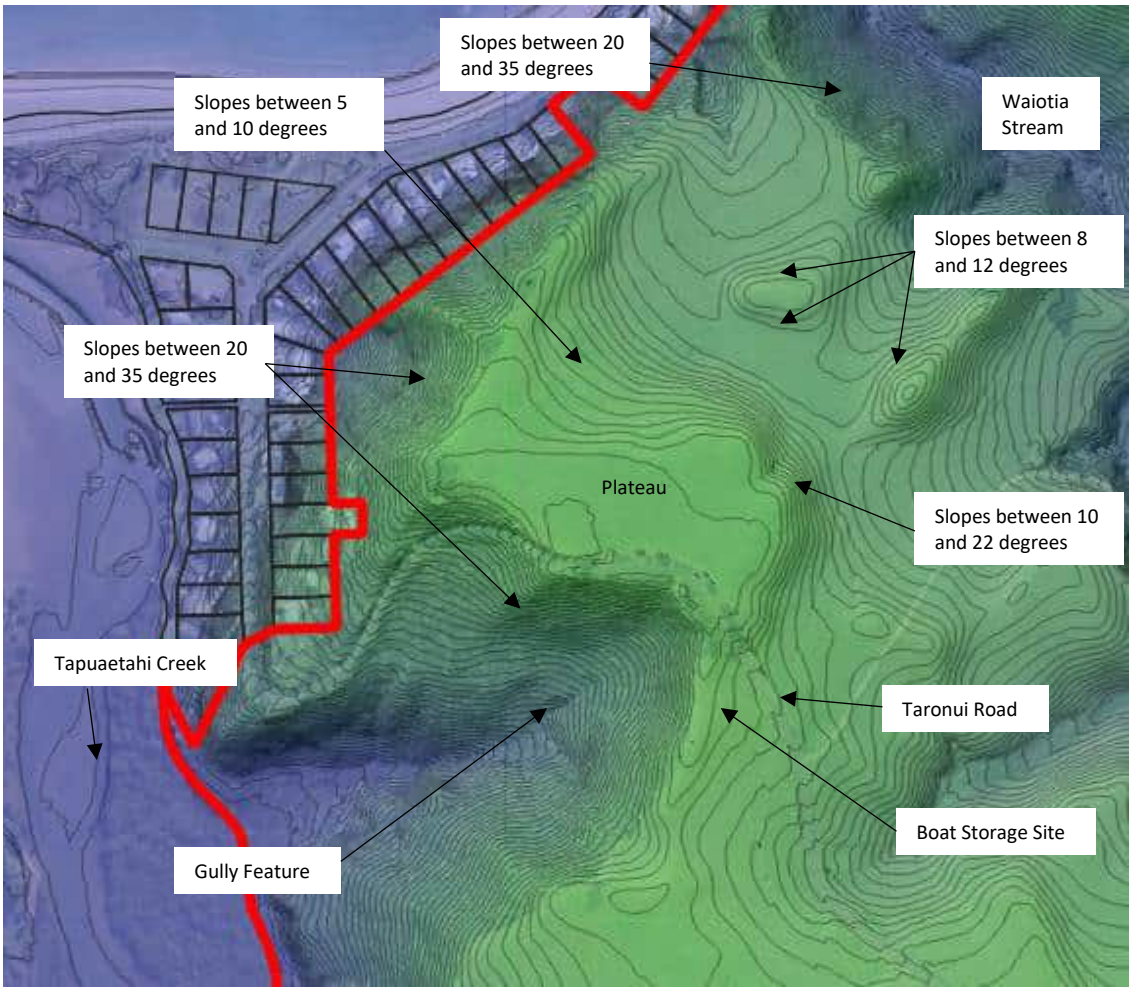


Figure 6. Site Geomorphology

Site boundaries indicative only, contours are shown at 1m intervals with blue shading lower elevations and green shading higher elevations, north is up the page. DEM courtesy of NRC.

.

5.4 Council Hazard Mapping

NRC and FNDC hazard layers have been reviewed and the development site is not located in an area susceptible to:

- Coastal erosion
- Erosion

5.4.1 FNDC Flooding

The development site is not mapped by the FNDC as being affected by flooding.

5.4.2 NRC Coastal Flooding

The development site is <u>not</u> mapped by the NRC as being affected by the predicted current, 50-year and 100-year coastal flooding events as shown in Figure 7. The predicted extent of flooding is limited to an area adjacent to the Tapuaetahi Creek near the base of a gully feature.

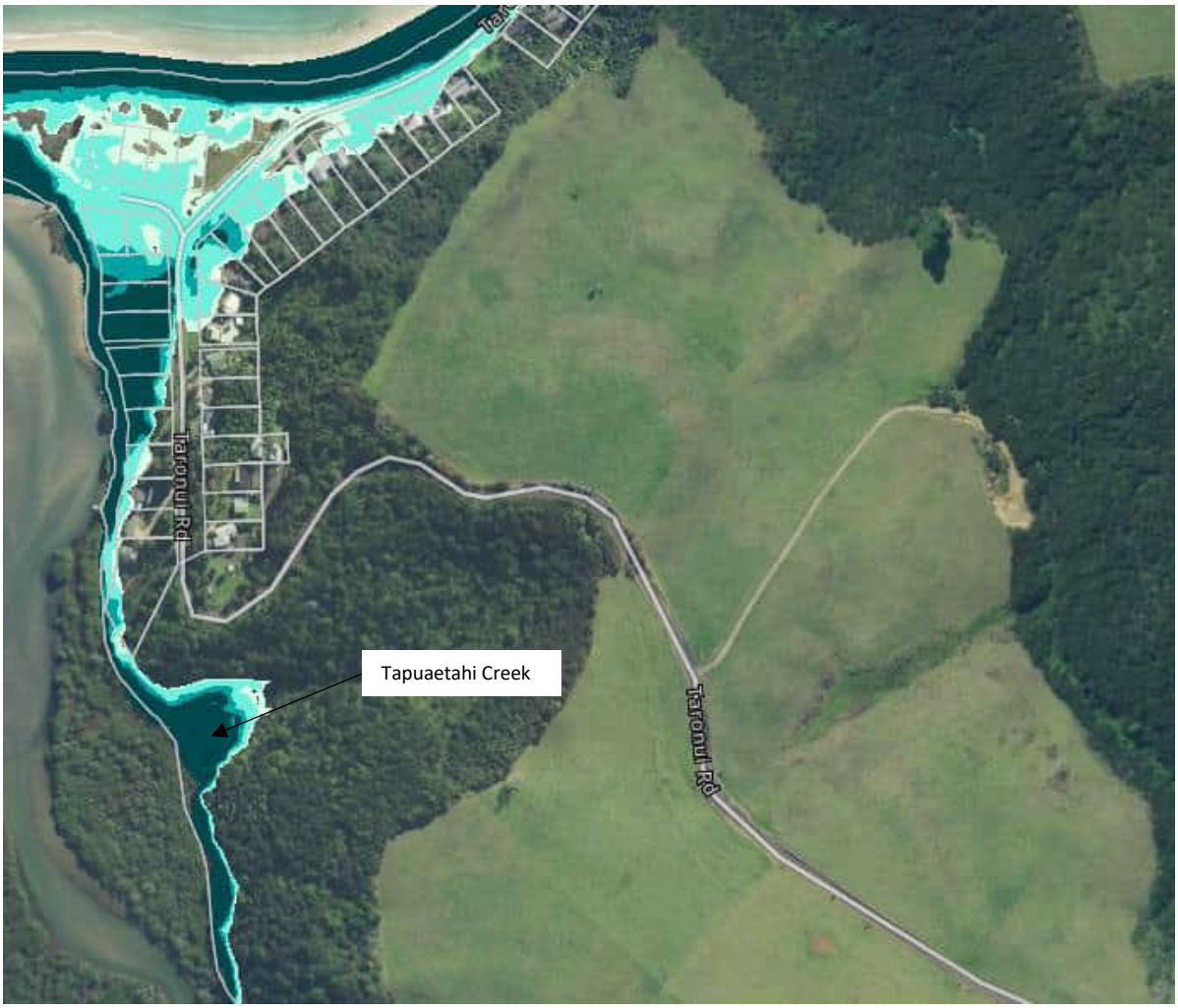


Figure 7. NRC Coastal Flood Extent
North at top of page, extract from NRC Maps

5.4.3 NRC River Flooding

The site is not mapped as being affected by flooding based on the NRC River Flood model, however the property is mapped as being affected by flooding on the NRC Region Wide Flood model for the 10-year, 50-year and 100-year flooding events as shown in Figure 8. The predicted extent of flooding is limited an area adjacent to the Waiotia Stream and a gully feature that leads to the stream.

Figure 8. NRC Region Wide Flood Model, Flood Extent
North at top of page, extract from NRC Maps

6 Site Observations

A site walkover was conducted by VISION on 20th and 21st May 2025. The following observations were made at the site and key site features are displayed on Figure 9 and 10 below.

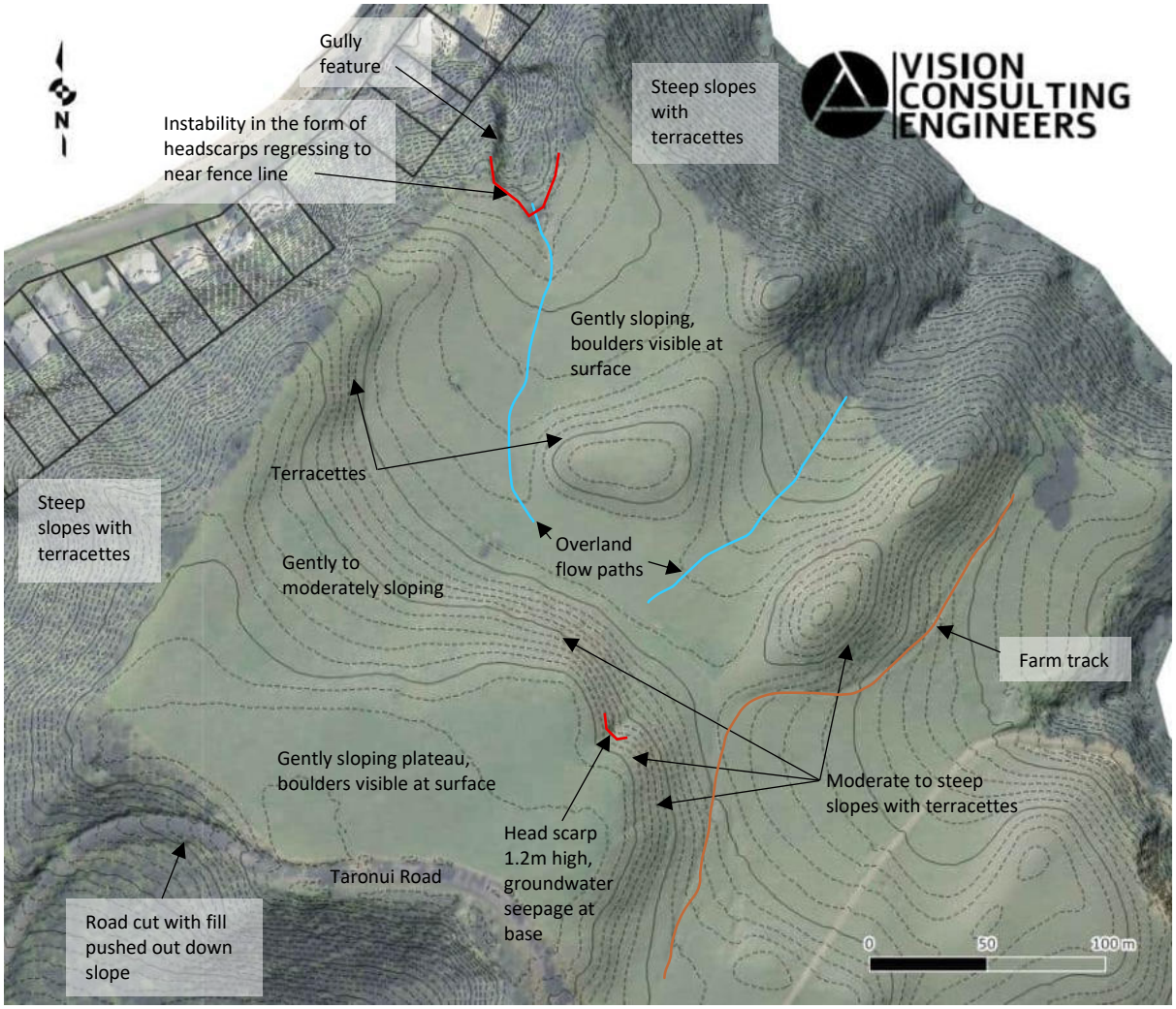


Figure 9. Site observations

Site observations made by VISION during the site walkover. 1.0m NRC Contours.

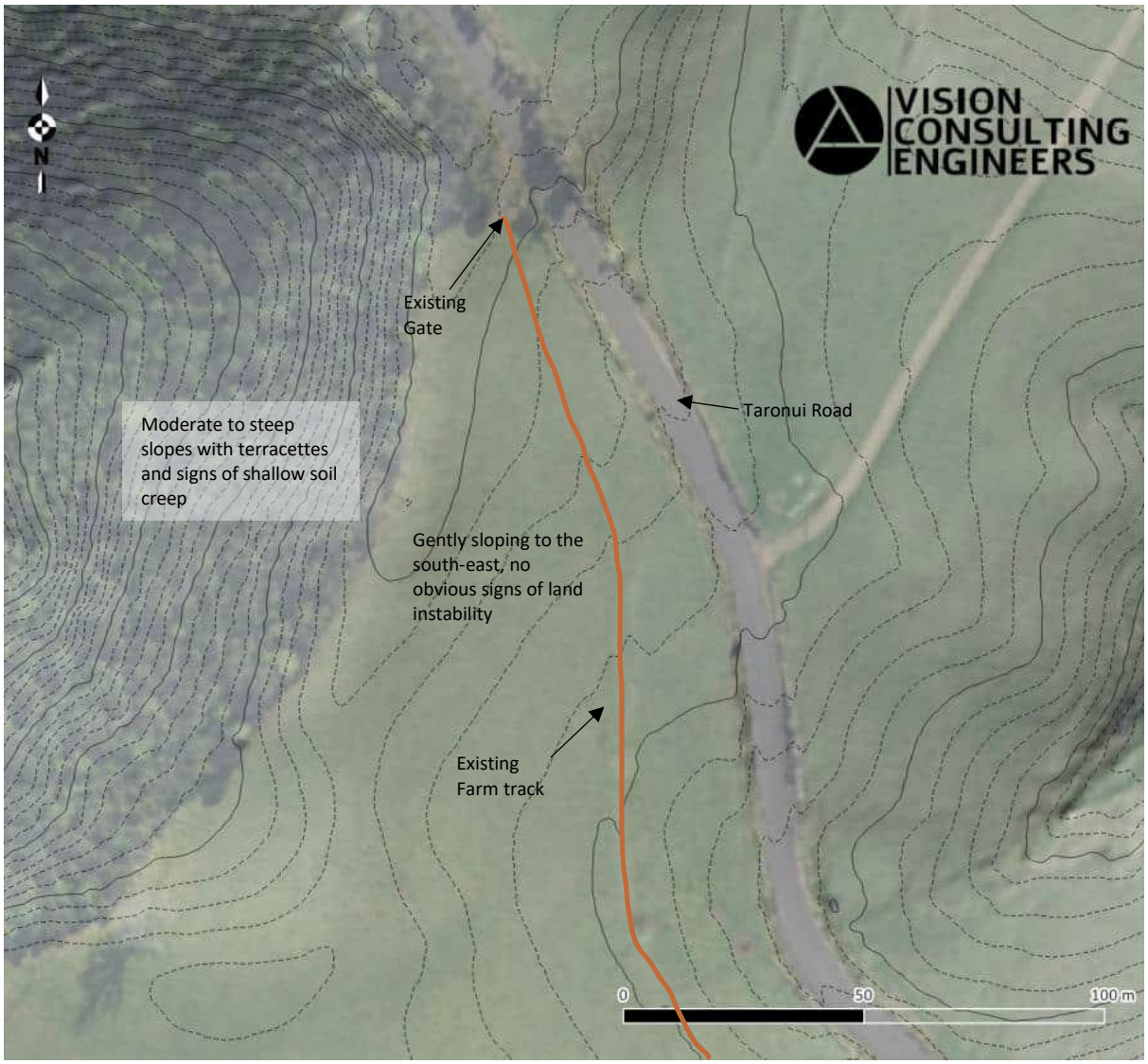


Figure 10. Boat shed site observations

Site observations made by VISION during the site walkover. 1.0m NRC Contours

7 Natural Hazards

Based on the assessments undertaken for this report and the requirements of Rule 13.7.3.2 of the Operative District Plan, we have summarised the findings in relation to the specific hazards identified in the rule within Table 2 below.

Table 2. Hazard Assessment

Hazard (Rule 13.7.3.2)	Addressed in Report?	Report Finding / Comment (Applicability)
(i) Erosion	Yes	No signs of erosion noted on the proposed building envelopes during site walkover (All lots). Minor signs noted on the grass slopes to the west of proposed lot 9 where terracettes are forming.
(ii) overland flow paths, flooding and inundation	Yes (Managed by process)	Overland flow paths noted; The internal road design is to take into consideration the overland flow paths and is intended to convey outside of lot boundaries using roadside drains. The road design may also act as a cutoff drain to divert surface flows. Inundation risk is considered low as overland flow paths are to be taken into consideration in the road design process. The site has a low risk of flooding due to the topography of the site (all lots) inundation risk for proposed house sites 20 and 15 have been addressed through the road design.

(iii) Landslip	Yes (Managed by process)	A desktop and site geomorphological assessment is included in the report. The site is categorised as having a Low to High Stability Hazard. To manage the risk on the steeper slopes, a geotechnical setback line has been established 10m from the crest of the moderately to steeply sloping land. This setback line helps define zones with different stability levels (low to high) and guides appropriate development within those zones. In addition to the geotechnical setback, areas of the site have been identified that show signs of shallow surface creep movement. The areas identified as potentially being susceptible to shallow soil movement are considered to be a medium hazard. Recommendation that all lots have a site-specific geotechnical assessment at the time of building consent prepared by a Chartered Professional Engineer. The recommendation is intended to mitigate the risk associated with building on or adjoining to moderate to steeply sloping land. (All lots, risk varies) Refer to Section 8.2 for further comment on land instability.
(iv) Rockfall	No	Not identified as a hazard in the report, i.e. not a relevant hazard for the lots.
(v) Alluvion	No	Not identified as a hazard in the report, i.e. not a relevant hazard for the lots.
(vi) Avulsion	No	Not identified as a hazard in the report, i.e. not a relevant hazard for the lots.
(vii) Unconsolidated Fill	Yes (Managed by process)	No obvious signs of unconsolidated fill noted on the proposed lots. Construction of new fills addressed by recommendation for a site-specific geotechnical assessment at the time of building consent prepared by a Chartered Professional Engineer. (All lots)
(viii) Soil contamination	No	Not mentioned or addressed in the report, it is outside the report's scope
(ix) Subsidence	Yes (Managed by process)	Near-surface soils exhibit expansive characteristics and typically fail to meet "good ground" requiring site-specific investigations and foundation design based on those investigations. This addresses the potential for settlement under load. (All Lots)
(x) Fire hazard	No	It is proposed that firefighting water supply is provided on individual lots in accordance with FNDC ES 2009. Refer to Section 13.2.
(xi) Sea level rise	Yes	Desktop review of coastal hazard mapping indicates proposed lots are not susceptible. (All Lots)

It is therefore assessed that natural hazards are avoided, remedied or mitigated in accordance with s106 of the RMA.

8 Geotechnical Feasibility Assessment

This geotechnical feasibility assessment is based on a desktop study, site visit observations and preliminary geotechnical investigations conducted on 20th and 21st May 2025. The weather was fine during the site visit and no rain events of note had occurred within the two weeks prior to the assessment.

8.1 Site conditions

The ground conditions encountered during the geotechnical investigations carried out at the site are considered to be consistent with those typically associated with the Kerikeri Volcanic Group.

8.1.1 Subsurface Conditions

Seven hand augured boreholes (BH1-BH7) were completed to depths ranging between 2.8 and 5.0 meters below ground level (m bgl) to understand the ground conditions at the site for the purpose of geotechnical feasibility. Logs of the boreholes are included in Appendix B. The locations of these boreholes are shown below on Figure 11.

The investigations indicate that the site is underlain by brown to dark brown clayey SILT (topsoil) to a depth of approximately 0.2 m bgl. Underlying the topsoil the investigations indicates that stiff to very

stiff silty CLAY and clayey SILT is present to depth of 5.0m bgl. Undrained shear strengths measured ranged from 83 kPa to greater than 165 kPa.

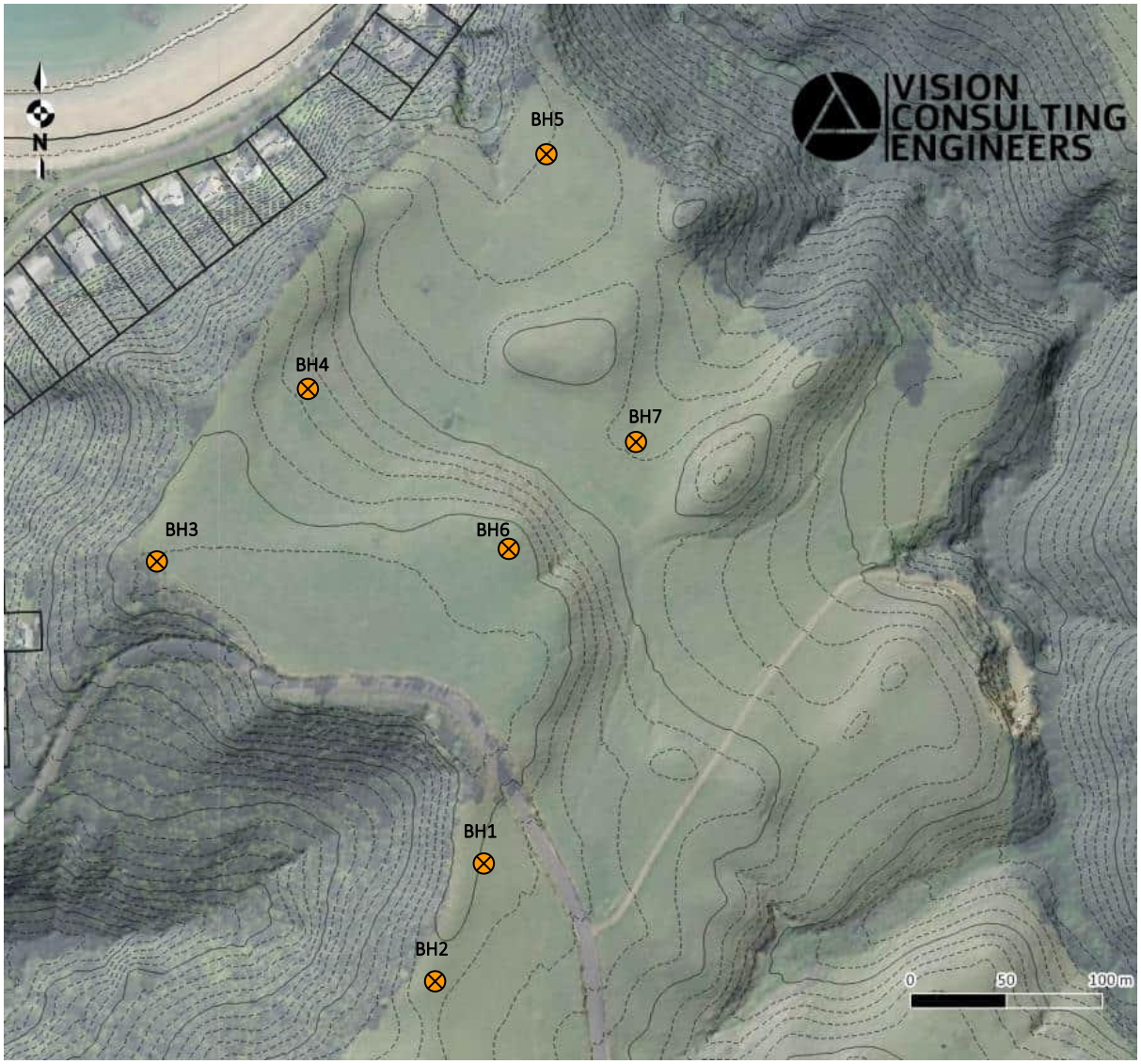


Figure 11. Geotechnical Testing Plan

Locations of geotechnical boreholes undertaken by VISION 20th and 21st May 2025. 1.0m NRC Contours

8.1.2 Groundwater

Groundwater was not encountered in the seven boreholes put down at the site (progressed up to depth of 5.0 m bgl). However groundwater seepage was observed at the base of the head scarp located on the grass slopes to the west of proposed Lot 9. Static groundwater level is expected to be at >5 m bgl. Perched groundwater table could be expected to rise during the winter months or extended periods of wet weather.

8.2 Stability Assessment

Based on the observed topography, evidence of shallow soil movement and historical ground movement, the site is categorised as having a Low to High Stability Hazard.

- **Low Hazard**: The relatively flat to gently sloping areas of the site are considered to have a low risk of instability.
- **Medium Hazard**: The moderately sloping areas that exhibit signs of shallow surface creep movement are categorised as having a medium hazard risk.

- **High Hazard**: The moderately to steeply sloping areas, particularly those showing signs of past ground movement, are categorised as having a high hazard risk.

To manage the risk on the steeper slopes, a geotechnical setback line has been established 10m from the crest of the moderately to steeply sloping land, as shown in Figure 12. This setback line helps define zones with different stability levels (low to high) and guides appropriate development within those zones. In addition to the geotechnical setback, areas of the site have been identified that show signs of shallow surface creep movement. The areas identified as being susceptible to shallow soil movement are considered to be a medium hazard and are shown in Figure 12.

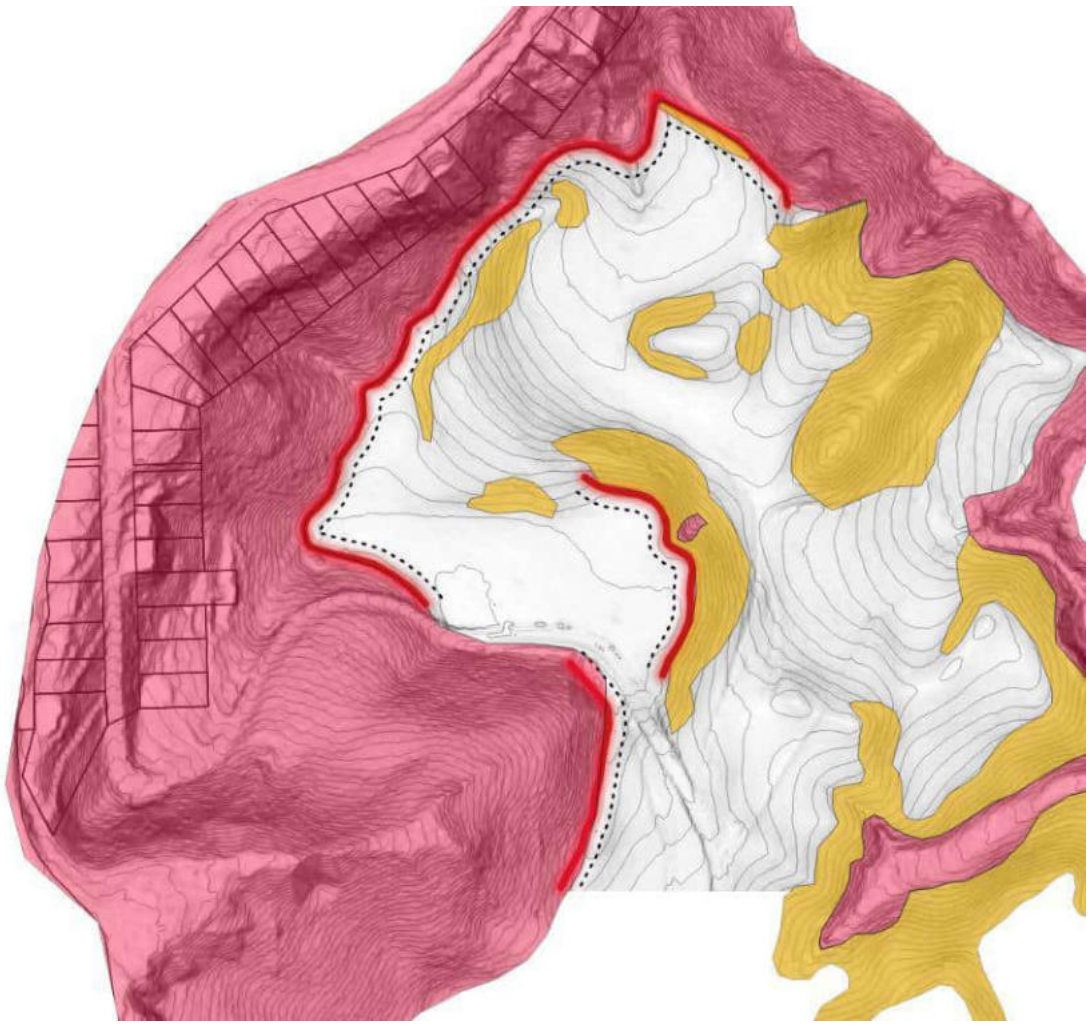


Figure 12. Stability Assessment

Contours are shown at 1m intervals with orange shading of 'Medium Hazard' area and red as 'High Hazard' area. The black dotted line is a 10m setback from the top-of-slope crest. The bold red lines are assessed as an indicative top-of-slope crest with the dashed-black line being a 10m geotechnical setback from the crest. The remaining area is considered low risk. North is up the page.

8.3 Key Geotechnical Considerations

The following geotechnical considerations are relevant to the proposed development (Figure 13):

- **Expansive Soils**:
  - **Observation**: The site is underlain by clay-rich soils derived from the Kerikeri Volcanic Group. These soils are known to have the potential to expand and shrink with changes in moisture content.

  - **Risk**: Expansive soil movement can exert pressure on foundations, leading to cracking, distortion, and potential instability of structures.

- **Slope Stability**:
  - **Observation**: The site has varying topography, with the majority of the site being relatively flat and the remainder sloping moderately to steeply down from the plateau. There are also signs of past ground movement on the steeper slopes. In addition, some areas of moderately sloping land have been identified that show signs of shallow surface creep movement.
  - **Risk**: Steeper slopes are less stable and more susceptible to landslides or slippage, especially when there is evidence of previous ground movement; building on or near such slopes increases the risk of structural damage or instability.

- **Earthworks in Areas with Cobbles/Boulders**:
  - **Observation**: The site's geology suggests that basalt cobbles and boulders may be present within the soil.
  - **Risk**: These cobbles/boulders can pose challenges during excavation and construction, potentially hindering excavation, damaging equipment, and complicating foundation and service installation.

- **Infrastructure:**
  - **Observation:** The site's geology suggests that basalt cobbles and boulders may be present within the soil.
  - **Risk:** These cobbles/boulders can pose challenges during excavation and construction, potentially hindering excavation, damaging equipment, and complicating foundation and service installation.

- **Building Platform and Earthworks Staging Strategy:**
  - To manage and balance the cut and fill earthworks, it is recommended that the bulk earthworks for individual building platforms generally be undertaken by future lot owners at the building consent stage. Indicative building platforms have been shown on the scheme plans to demonstrate feasibility for resource consent purposes.
  - As an exception to this strategy, it is recommended that the developer complete the specific land improvements (earthworks and retaining structures) for Lot 17 during Stage 4 of the development. Specific design work and retaining walls were required to demonstrate feasibility for this constrained site.

This assessment highlights the key geotechnical considerations that need to be addressed during the detailed design and construction phases of future development at the site.

To mitigate these geotechnical risks, it is recommended that all lots have a site-specific geotechnical assessment at the time of building consent prepared by a Chartered Professional Engineer.

For any proposed dwellings that are to be located within a geotechnical hazard area, it is recommended that site specific slope stability assessment is carried out on the proposed building area by a Chartered Professional Engineer with experience in geotechnical engineering at the time of the Building Consent.

Figure 13. Oblique Areial of Site

Courtesy Northland Regional Landscape Assessment Worksheet dated February 2014.

9 Feasibility Onsite Wastewater Assessment

The site is not serviced by a wastewater reticulation system and is not expected to have FNDC-based reticulation in the near future.

9.1 Soil Survey and Analysis

A soil survey was undertaken at the site to determine the suitability for application of treated effluent. The soil survey was carried out based on five hand auger boreholes (INV1-INV5) completed to a depth of 1.2 m bgl for the purpose of confirming the soil category to demonstrate the feasibility for on-site wastewater management. The borehole logs are included in Appendix B and the locations of these boreholes are shown below on Figure 14.

Hand augured boreholes INV1 to INV3 encountered soils considered to be consistent with those typically associated with the Kerikeri Volcanic Group. Boreholes INV1, INV4 and INV5 generally found dark brown clayey SILT (topsoil) to a depth of up to 0.2 m bgl. Underlying the topsoil, brown clayey SILT (residual soil) was encountered to a depth of 1.2 m bgl.

Hand augured borehole INV2 and INV3 encountered soils considered to be consistent with those typically associated with the Waipapa Group. Boreholes INV1 and INV2 found dark brown clayey SILT (topsoil) to a depth of up to 0.2 m bgl. Underlying the topsoil, pale orangish brown silty CLAY (residual soil) was encountered to a depth of 1.2 m bgl. In addition, the seven geotechnical boreholes (BH1-BH7) discussed in Section 8 of this report provide a broader overview of the soils across the site.

The ground investigations undertaken at the site indicated that the soil is Category 6 (slow draining) as defined by ARC TP58 with a design loading rate of 3 litres per square metre per day.

Figure 14. Wastewater Ground Investigations

Concept land application areas hatched in blue, concept plan provided by the Client. North at top, not to scale.

9.2 Preliminary Onsite Wastewater Design

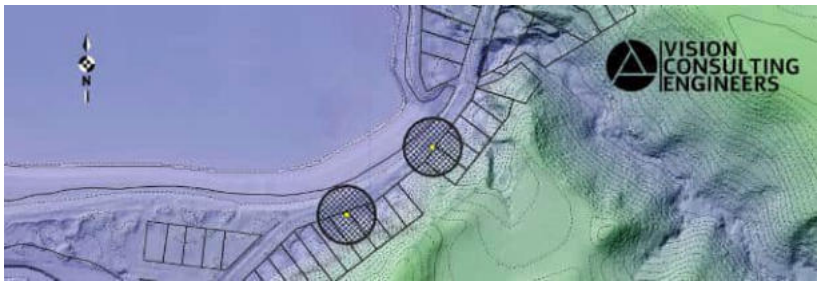
Based on the findings of this feasibility assessment, the following preliminary onsite wastewater assessment is provided. Vision's Wastewater Plan is included in Appendix C.

9.2.1 Site Evaluation

A range of site features were assessed in terms of the degree of limitation they present for an on-site wastewater management system. A summary of key features in relation to effluent management at the site are listed Table 3.

Table 3. Site Evaluation

Feature	Description
Climate	Northland is a sub-tropical climate zone, with warm humid summers and mild winters. Typical summer temperatures range from 22°C to 26°C (maximum daytime) but seldom exceed 30°C. In winter, high temperatures are between 14°C to 17°C. Annual sunshine hours average about 2000 in many areas. Mean annual rainfall is 1400mm for the site location.
Exposure	The proposed Lots are moderately exposed providing them with medium sun and wind exposure.
Vegetation	The site is covered in grass, with vegetation present on the moderately to steeply sloping land.

Slope	The site is generally located on a flat to gently sloping plateau. Moderate to steep slopes extend down from the plateau. Slopes are presented in Figure 15. Areas sloping at 10 to 25 degrees are shown at orange, areas sloping at greater than 25 degrees are shown as red. Special consideration and discharge consent would be needed to mitigate the potential environmental effects when discharging on slopes greater than 25 degrees.
Fill	No obvious signs of fill have been identified on the site, other than fill placed to form Taronui Road.
Erosion Potential	No obvious signs of erosion have been noted over the areas assessed for land application of partially treated effluent.
Surface Water	Surface water cutoff drains may be required to divert surface flows around the land application areas. The proposed internal access and roadside drains may be utilised as an effective surface water control. The proposed active areas are located outside of concentrated flow paths based on site geomorphology.
Flood Potential	The proposed system is not located in areas susceptible to flooding. Refer to Figure 7 and 8.
Stormwater run-on and upslope seepage	The proposed systems should include surface water cut-off drains where appropriate. The proposed private access ways may act as surface water cutoff drains.
Groundwater	Groundwater was not encountered in the geotechnical boreholes conducted at the site progressed to a maximum of 5.0 m bgl. Groundwater bores are present on properties to the north-east of the site at the base of the hillside. Groundwater is recorded as being at 1.8 to 2.3m below ground surface level within the bores. The image below shows the NRC GIS location of the bores (yellow dots) with a 30m buffer, indicating that the bores are well away from the proposed development. 
Site Drainage and Subsurface Drainage	Site drainage will need to be addressed at the time of Building Consent. At this stage, no subsurface drainage is recommended.
Recommended Buffer Distances	All buffer distances recommended in Northland Regional Council's Regional Plan, the District Plan and ARC TP58:2004 are to be complied with. Setbacks required by TP58 are presented below.

Minimum Recommended Separation Distance	Wastewater Treatment Level				
	Primary (Septic tank plus effluent outlet filter)	Secondary (AWTS)	Advanced Secondary (Packed Bed Reactor)	Tertiary (Disinfection Note 9)	Advanced Tertiary[10] (Nutrient reduction & disinfection)
Buildings/Houses[1]	3m	1.5 to 3m	1.5 to 3m	1.5 to 3m	1.5 to 3m
Property Boundary[2]	1.5m	1.5m	1.5m	1.5m	1.5m
Surface Water[3]					
Soil Category 1[4]	Note 4	10m	10m	10m	10m
Soil Category 2 - 3	20m	10m	10m	5 - 10m[11]	5m[11]
Soil Category 4 - 6	20m	15m	15m	5 - 10m[11]	5m[11]
Soil Category 7	Note 4	15m	15m	5 - 10m[11]	5m[11]
Water Supply bore[5]					
Soil Category 1	Note 4	20m	20m	10m	10m
Soil Category 2 - 3	20m	20m	20m	10m	10m
Soil Category 4 - 6	20m	20m	20m	10m	10m
Soil Category 7	Note 4	20m	20m	10m	10m
Groundwater[6&7]					
Soil Category 1	Note 4	1500mm	1200mm	1000mm	900mm
Soil Category 2 - 3	1500mm	1200mm	900mm	600mm	600mm
Soil Category 4 - 6	1200mm	900mm	600mm	600mm	600mm[8]
Soil Category 7	Note 4	600mm	600mm	600mm	600mm
Floodplain[7] *(Return Period Storm)*	One in 100 year	One in 20 year	One in 20 year	One in 20 year	One in 20 year
Embankments/ Retaining Walls[9]	3m from the drainage material/cut batter interface or 45° angle from toe of wall excavation (which ever is the greatest)				

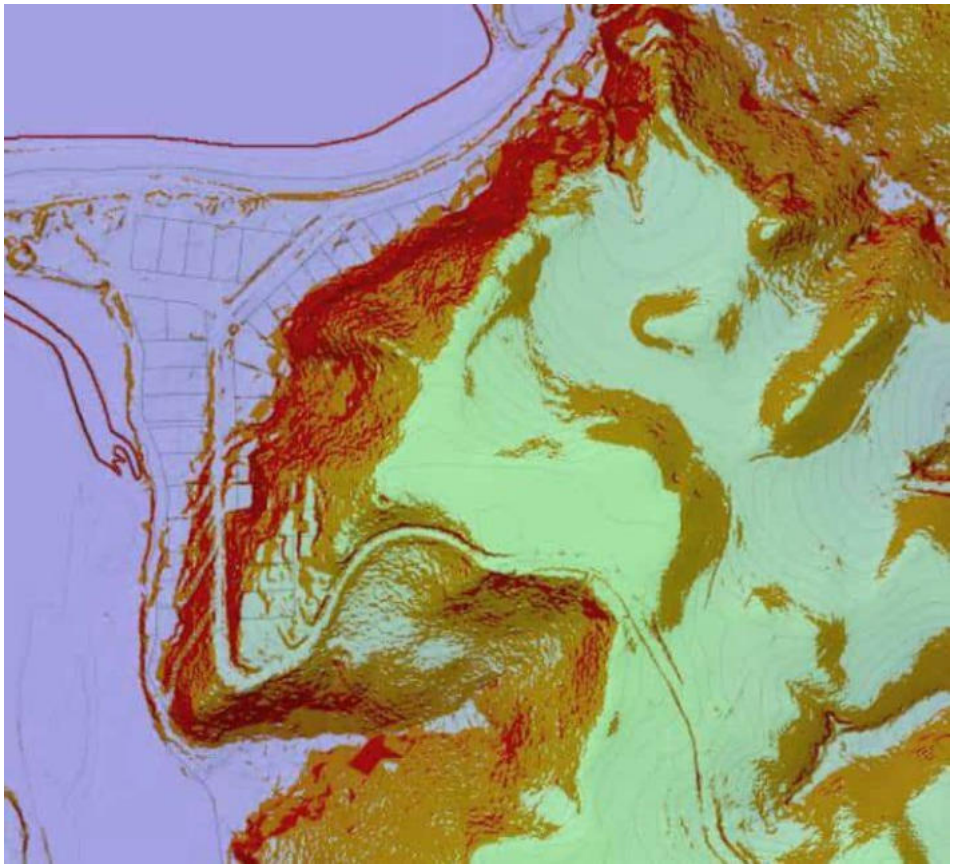


Figure 15. Slopes for Wastewater

Areas sloping at 10 to 25 degrees are shown at orange, areas sloping at greater than 25 degrees are shown as red. Special consideration and discharge consent would be needed to mitigate the potential environmental effects when discharging on slopes great than 25 degrees.

9.2.2 Modified STEP System

The Incorporation has chosen a modified Septic Tank with Effluent Pump (STEP) system for the proposed development, preferring a decentralised on-site wastewater solution. Each lot will provide its own advanced secondary on-site wastewater treatment system with UV disinfection. The treated

wastewater from each lot will then be pumped via low pressure lines to a central storage tank with 24 hours of emergency storage. The treated wastewater is then pumped through a second stage of UV disinfection before being applied to the land application areas via pressure compensated drip irrigation lines.

Based on the proposed site plan the development is anticipated to have 20 lots with a future dwelling on each lot. It is anticipated that the wastewater load from a future dwelling is 1200 L/day (assuming a 4-bedroom dwelling, 6 people maximum design occupancy, high water usage flow allowance of 200 l/person/day.) Due to the slope angles at the site, it is anticipated that sub-surface mounted pressure compensating drip lines will be suitable for the proposed future activities. We have assumed a soil category of 6 with a design loading rate of 3 litres per square meter per day and a 33% reserve area.

Therefore, it is anticipated that each lot will require an active are of approximately 400m^2 for the disposal of tertiary treated effluent via pressure compensating dripper lines. The design incorporates 5 sequencing valves that dose 16 separate 500m^2 active areas. Figure 16 below outlines the process.

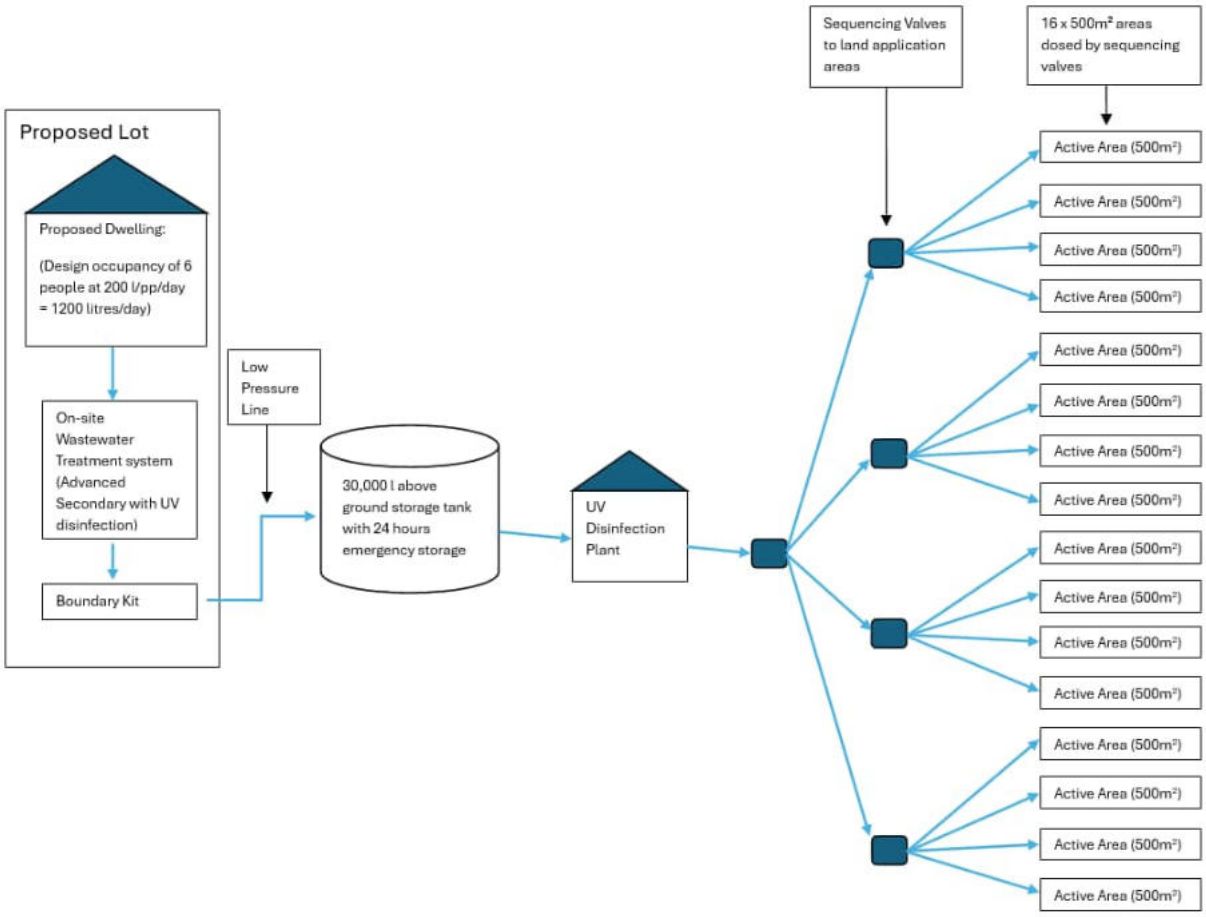


Figure 16. Process Flow Diagram

Indicative flow diagram of the proposed modified STEP SYSTEM

Staging of the Wastewater Infrastructure: To align with the project's 6-stage delivery, the decentralised wastewater system and its associated pipe network will be constructed using a phased approach:

- **Stage 1 (Phase 1 WWTP & Reticulation):** During Stage 1, a temporary accessway (4m total width) will be formed from the main roadway (Chainage 90 – 250 m in Figure 17) to the Wastewater Storage Tank and UV treatment building. During Phase 1, wastewater pipes will be laid, comprising approximately 400 m of 50mm ID PE100 SDR11 (PN16) wastewater delivery pipe will be installed

in accordance with FNDC Engineering Standards 2023. This initial network is strategically routed to serve all lots developed during Stage 1 through Stage 3 (Lots 1 through 12).

- **Stage 4 (Phase 2 WWTP Reticulation):** Phase 2 involves laying an additional 312 m of 50mm ID PE100 SDR11 (PN16) wastewater delivery pipe. This network will branch off the primary infrastructure to connect and serve the remaining lots delivered in Stages 4, 5, and 6 (Lots 13 through 20).

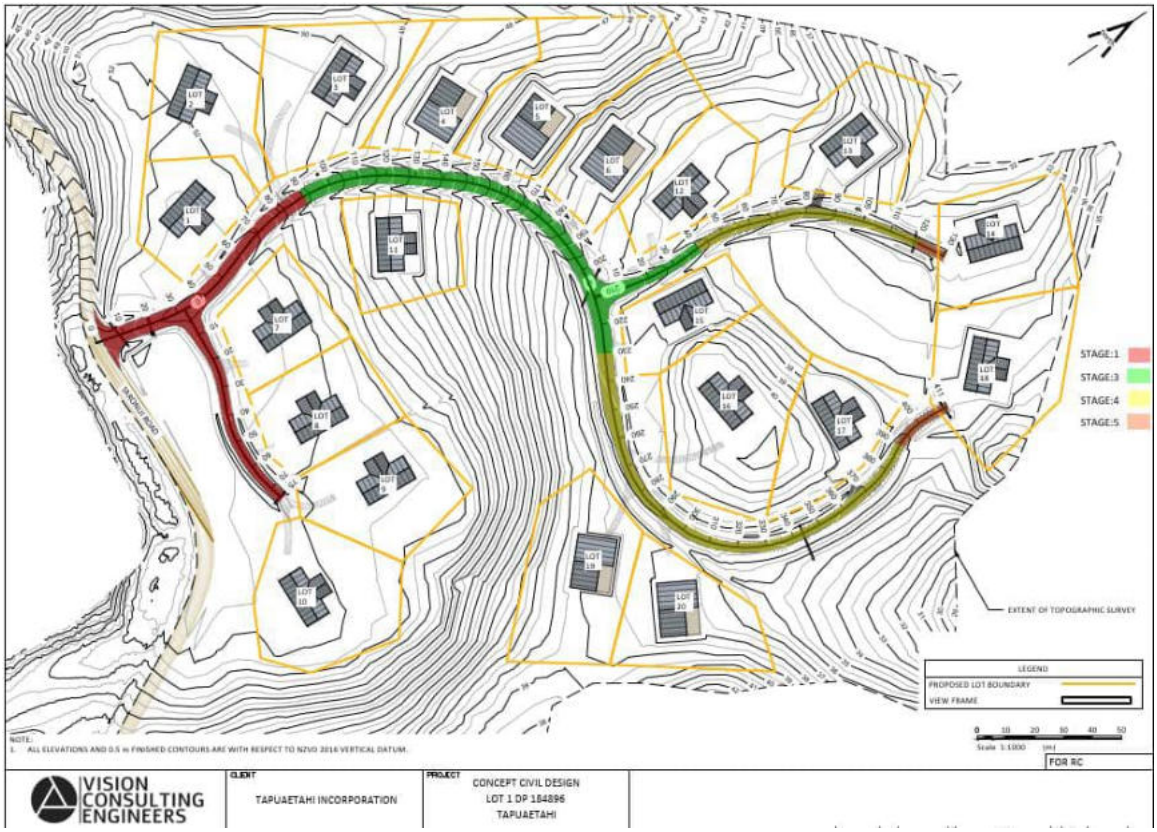


Figure 17: Proposed Roadway Construction Staging Plan

Plan illustrating the phased roadway network construction from Stage 1 through Stage 5.

9.2.2.1 Land Application Areas

Figure 18 illustrates the potential 16x500m^2 land application areas for the treated wastewater totalling 8,000 m^2. These areas have been identified based on factors such as soil type, slope, and proximity to water bodies. The final selection of land application areas will be determined from on-site inspection in consultation with the Incorporation and relevant stakeholders, ensuring that the chosen approach aligns with the values and environmental goals. A potential 33% reserve area totalling 2640m^2 has been provided in the central portion of the site.

Table 4. Summary of land application area STEP System

Area Required for Disposal of Effluent (using a 33% Reserve)(m^2)
8,000m^2 (active) + 2,640 m^2 (reserve) = 10,640 m^2

9.2.2.2 Further Considerations

The Incorporation should develop a long-term asset management plan for the STEP system, including provisions for ongoing maintenance, monitoring, and eventual renewal of components. This will ensure the system's sustainability and protect the Incorporation's investment over time.

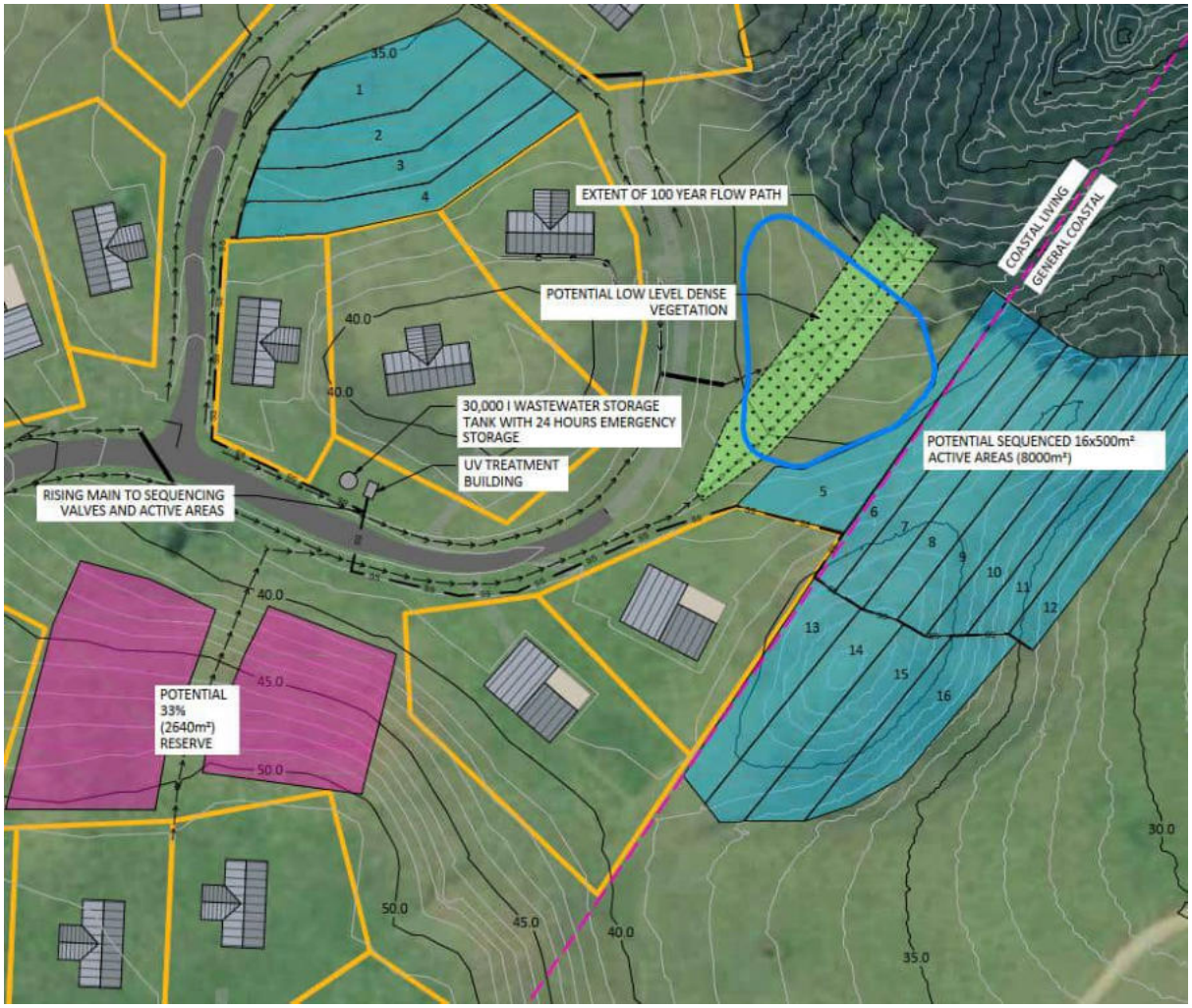


Figure 18. Concept Wastewater Plan

Potential land application areas are highlighted blue being 16x500m^2 areas totalling 8000m^2. Potential 33% reserve highlighted pink. The land application areas are set back from site constraints as per ARC TP58

Based on the findings of this feasibility assessment, it is recommended that the following specifications-based consent condition be included in the resource consent for the proposed development, aiming to ensure that the on-site wastewater system is designed, constructed, and operated in a manner that protects public health and the environment.

> *"Prior to Section S223 – Prior to the commencement of any physical works on the site, the Consent Holder shall provide necessary consent approvals from the Northland Regional Council for the development."*
>
> *"Prior to Section S223 – The Consent Holder shall provide evidence that a building consent has been granted by the Far North District Council (or relevant authority) for the physical constriction of the site wastewater treatment and/or disposal system."*

10 Feasibility Internal Access and Boat Storage Yard

This section assesses the suitability of the proposed internal accessways and dedicated boat storage yard. The assessment is based on Concept Civil Design drawings included in Appendix D, which was developed from the Littoralis Landscape Architecture "Detailed Site Plan" (Ref. 1374, Appendix A) and incorporates recommendations from Engineering Outcomes "Assessment of Traffic Effects" report (Appendix E).

10.1 Internal Accessway Concept Design

10.1.1 Horizontal Alignments

The internal accessways comprise three distinct alignments: Roadway A, Roadway A1, and Roadway A2, detailed in Appendix D. Intersection crossings have been designed in accordance with FNDC/S/6B from the FNDC ES 2009. These designs are intended to support suitable access for rigid heavy vehicles into each accessway. The crossing between Taronui Road and Roadway A includes extended excavations to the west to achieve sight lines as recommended by the *Assessment of Traffic Effects* report.

10.1.2 Vertical Alignments

The proposed internal accessways largely follow the existing ground contours, with specific modifications incorporated to manage secondary stormwater flows across designated road sections and along roadside drains. Additionally, Roadway A, between chainage 310 m and 390 m, includes up to 0.9 m of engineered fill. This fill is strategically designed to achieve the necessary gradients for a functional and safe private crossing for Lot 17.

10.1.3 Pavement Design

For simplicity, a single pavement design has been adopted for all internal accessways, using the AADT of 90 vehicle movements per day for the 20 households, as recommended in the A*ssessment of Traffic Effects* report on this development. The concept pavement detail in Sheet 21 consists of a 125 mm depth of subbase (GAP 65), a 100 mm depth of basecourse (GAP40), and a Grade 3/5 chipseal surface. This design is predicated for a minimum subgrade Californian Bearing Ratio (CBR) of 7. It is recommended that subgrade testing is carried out during detailed design and/or as part of construction to confirm the CBR value and validate the pavement design assumptions. Pavement Calculations are included in Appendix G.

10.1.4 Road Section Details

Five distinct road sections are proposed within the development site, detailed in the drawings in Appendix D (Sheets 14 and 15). Carriageway widths vary from a maximum of 5.5 m over the initial 252 m of Roadway A to a minimum of 3.0 m where accesses serve two or fewer lots. These access widths have been adopted from recommendations provided in the *Assessment of Traffic Effects* report.

Crossfalls are 3% from the centreline crown for Sections 1, 3, and 5 and there is a super-elevation of 3% for Sections 2 and 4, ensuring efficient surface water drainage. Road shoulders of 0.25 m width are proposed on all sections, with 1V:4H slopes. Open swale drains, incorporating low-level dense vegetation for stormwater conveyance, are proposed along both sides of all internal accesses, except for Roadway A chainage 310 m to 392 m (Section 4), where an open drain is provided on the upslope side only and engineered fill on the downslope side.

Cut slopes are proposed at 1V:2.5H where possible and fill batters at 1V:4H. While 1V:2H fill batters may be considered during detailed design, the proposed slopes are considered stable and suitable for the conceptual stage.

10.1.5 Roadway Construction Staging and Temporary Works

To manage and balance cut and fill earthworks, the internal roadways will be constructed in stages as shown in Figure 19. Throughout all stages, roadway culverts and open swale drains will be formed concurrently with the roadway construction to manage stormwater. Roadway staging is defined as follows:

- **Stage 1:** Formation of Roadway A up to the 90 m chainage and the full completion of Roadway A1.
- **Stage 1 (Temporary WWTP Access):** To facilitate Phase 1 of the wastewater system construction, a 4 m wide temporary accessway will be formed along the future Roadway A alignment from chainage 90 m to 250 m. Construction involves stripping 200 mm of topsoil, placing a geotextile layer for separation, and forming a 3 m wide running surface using 100 mm of GAP65 aggregate. 0.5 m wide open drains will be formed on each side. The road will follow the existing ground gradient so that the final design crossfall can be achieved when the road is upgraded to its permanent standard in later stages. This temporary access will be managed under GD-05 erosion and sediment control guidelines.
- **Stage 3:** Extension of Roadway A to the 230 m chainage and formation of Roadway A2 up to the 40 m chainage. *(Note: The temporary WWTP access will be removed, and the roadway will be constructed as per the final design drawings at this time.)*
- **Stage 4:** Extension of Roadway A to the 390 m chainage and formation of Roadway A2 up to the 120 m chainage.
- **Stage 5:** Final completion of Roadway A and Roadway A2 to their full extents.

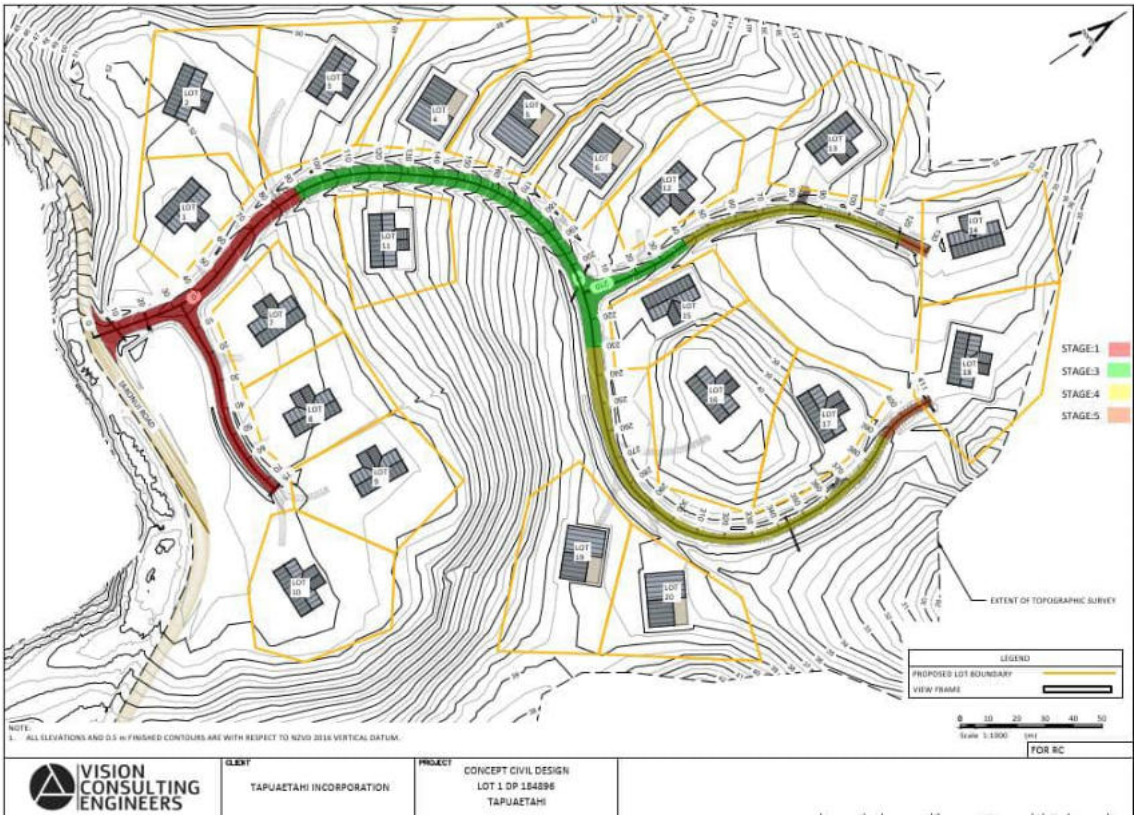


Figure 19: Proposed Roadway Construction Staging Plan

Plan illustrating the phased roadway network construction from Stage 1 through Stage 5.

10.2 Boat Storage Yard Concept Design

The boat storage yard is designed as a large, paved area for the manoeuvring and parking of vehicles with boat trailers. Its single access point from Taronui Road is designed to allow safe entry from the south without requiring vehicles to cross the Taronui Road centreline. The current concept provides a trafficable entrance width of 10 m. Minor refinements may be undertaken during detailed design for optimisation of the entrance width. The entrance section is shown with a superelevation of 5% to achieve sufficient surface water drainage.

The paved area incorporates a 3% crossfall from the northwestern to the southeastern side to allow surface water on the pavement to sheet flow away, and a 1% fall from the northwestern to the southwestern corner, allowing installation of a cut-off drain along the northwestern boundary (Open Drain 10, Sheet 16 of Appendix D).

The Boat Storage Yard is scheduled for construction in the final phase (Stage 6) to balance earthworks. The boat yard requires a net fill volume of approximately 1025 m^3. Constructing this facility in the final stage allows the project to utilise surplus cut material from the wider site, specifically the bulk excavations generated from the formation of the stormwater attenuation pond in Stage 3.

10.2.1 Boat Storage Yard Pavement Design

The boat storage yard pavement design comprises a 110 mm depth of subbase (GAP 65), a 100 mm depth of basecourse (GAP40), and a Grade 3/5 chipseal. This design also assumes a subgrade CBR of greater than or equal to 7. As there is up to 1.4 m of engineered fill under the pavement, it is recommended that subgrade testing is carried out during detailed design and/or as part of construction to confirm the CBR values and validate the pavement design assumptions (CBR ≥ 7).

11 Stormwater Management

This section details the proposed stormwater management strategy for the development, addressing both individual proposed lots and surface water flows from the internal accessways and boat storage yard. The design incorporates climate change allowances and adheres to relevant FNDC DP rules, FNDC ES 2009 and NZBC:E1 requirements.

11.1 FNDC District Plan Compliance

The development includes areas zoned Coastal Living and General Coastal. The FNDC DP stipulates maximum impervious surface areas for permitted activities:

- Rule 10.6.5.1.6 STORMWATER MANAGEMENT - Permitted (General Coastal): Maximum 10% of gross site area covered by impervious surfaces.
- Rule 10.7.5.1.6 STORMWATER MANAGEMENT - Permitted (Coastal Living): Maximum 10% of gross site area or 600 m^2, whichever is lesser.

11.1.1 Proposed Lots

All Proposed Lots are located within the Coastal Living Zone.

Based on indicative building areas (200 m^2 to 255 m^2), proposed lot sizes ranging from 1120 m^2 to 2585 m^2 and additional requirements for driveway surfaces, individual lots in the Coastal Living zone will likely exceed the impervious area thresholds as per FNDC DP Rule 10.7.5.1.6.

Therefore, it is recommended that stormwater attenuation for each lot be designed by a Chartered Professional Engineer for a 10% Annual Exceedance Probability (AEP) storm event, including climate

change allowances. The design should attenuate runoff from 150% of the building roof area to account for driveways and other hardstand surfaces.

11.1.2 Catchment Analysis & Redirection

The site has two primary discharge points, designated Point A and Point B (see Figure 20). Currently, Catchment A drains to an existing stormwater culvert inlet located southeast of Te Tii Tapuaetahi No 41 Block at Point A. A key design objective is to reduce peak flows to this inlet.

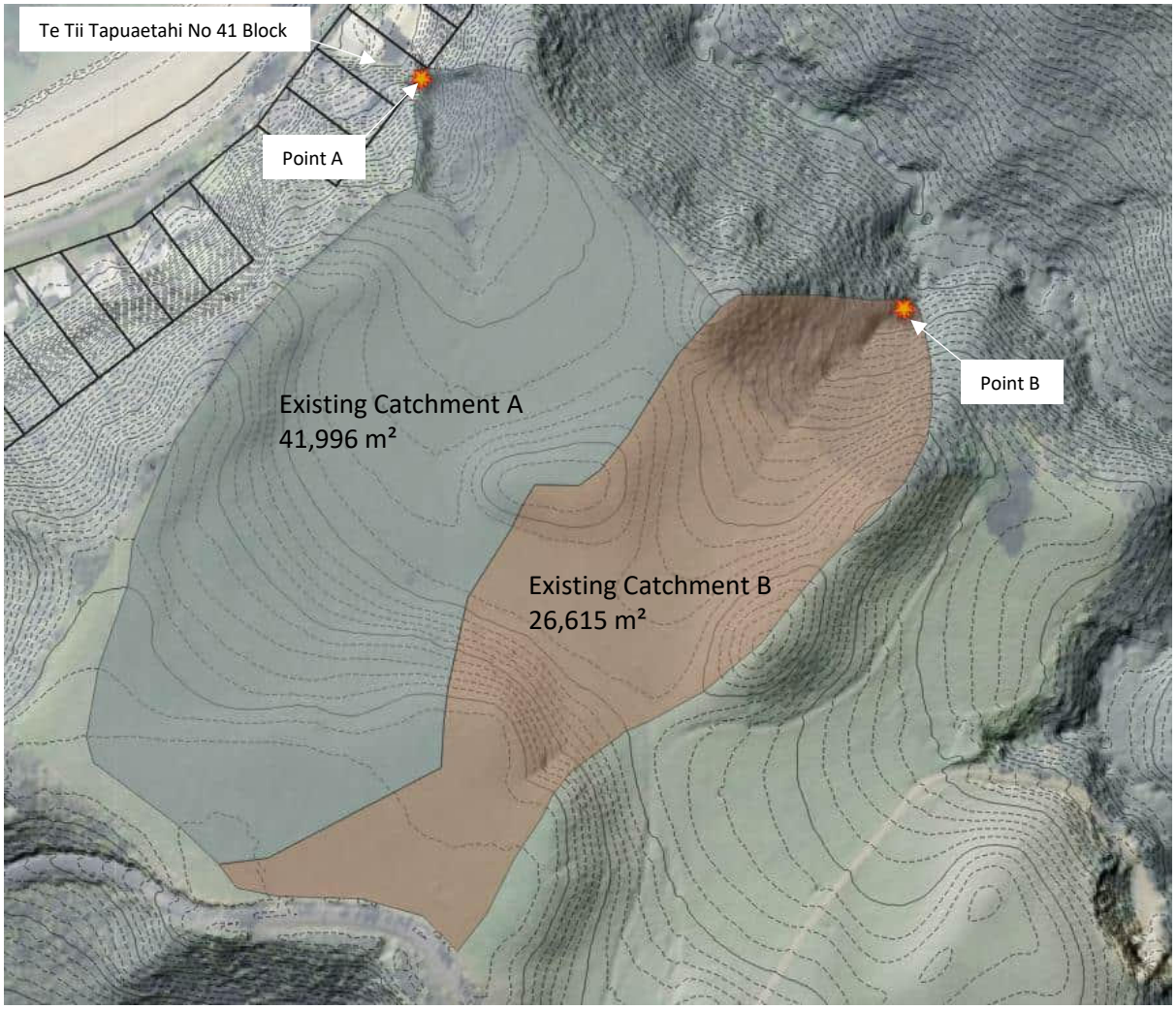


Figure 20. Existing Catchments and Discharge Points

This reduction is achieved by installing surface water cut-off drains that divert a portion of the runoff from Catchment A to the outlet at Point B. This action increases the catchment area and flow volume directed to Point B.

The post-development model (see Figure 21 and Appendix F Calculations) accounts for all proposed impervious surfaces and uses rainfall data adjusted for climate change. This analysis confirms that even with the new impervious areas, the diversion the model indicates the diversion reduces the peak flow at Point A 27% below its pre-development level.

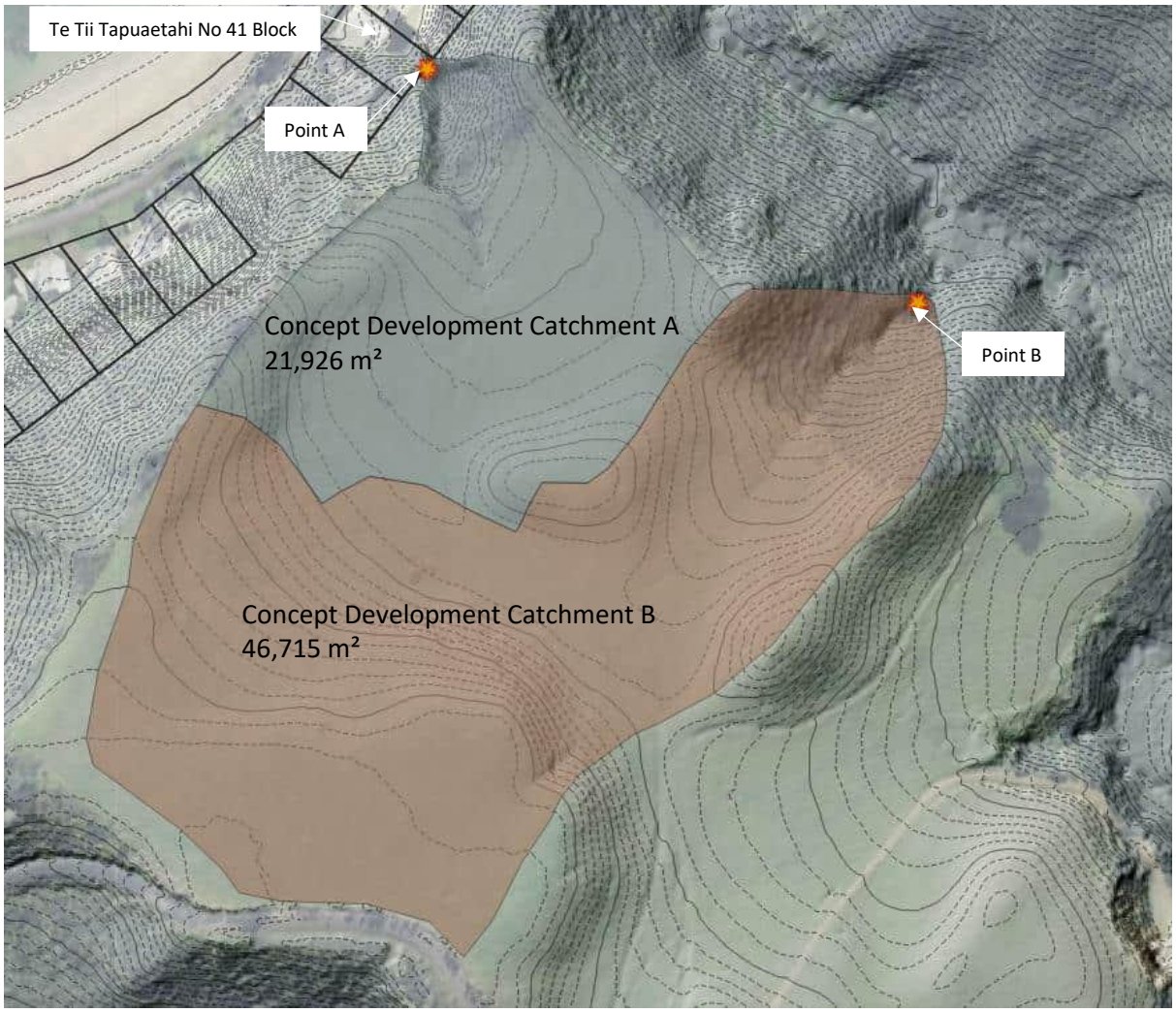


Figure 21. Concept Development Catchments and Discharge Points

11.1.3 Balance Lot Attenuation Recommendation

The internal accessway is located within the Coastal Living Zone of the balance lot. The combined effect of diverting flow from Catchment A and creating new impervious accessways (which exceed the 600 m² threshold) results in an increase in peak stormwater flows at Point B.

To mitigate downstream effects, it is recommended that the stormwater runoff from the property, shall be managed so that the post-development peak discharge rate does not exceed the maximum pre-development peak flow rate, including relevant climate change allowances. The design shall be submitted to the Far North District Council for review and written approval prior to the commencement of works and issue of a Section 223 Certificate. The works shall be constructed in accordance with the approved plans and specifications and certified by a Chartered Professional Engineer upon completion and prior to issue of a Section 224 Certificate.

A preliminary assessment indicates that a detention/attenuation pond is a feasible option. A potential location for this pond has been identified in the north-eastern portion of the development site (see Figure 16), which could effectively manage the runoff from these remaining areas before discharging from the site.

The stormwater attenuation pond will be constructed during Stage 3 of the development for the following reasons:

- **Hydrological Balance (Catchment B Impact):** Stages 1 and 2 primarily involve development on the south and western side of the site. Stage 3 encompasses the development of the central plateau (Lots 4, 5, 6, 11, 12, 15) and the extension of Roadway A to 230m. Once this cumulative increase

in impervious surfaces and the redirection of runoff into Catchment B is reached, attenuation of outflows in the stormwater pond is required. The pond attenuates post-development peak flows at Point B back to pre-development rates.

- **Earthworks Balancing:** Excavating the attenuation pond generates approximately 3300m³ of cut material. By scheduling this excavation in Stage 3, the project retains this material on-site to be used as structural fill for the remaining roadway extensions in Stage 4, and ultimately for the Boat Storage Yard in Stage 6. This reduces double-handling of material and need for imported fill and minimises the exposure of stockpiles or bare ground to erosive conditions.

11.2 Internal Access and Boat Storage Yard Stormwater Management

Surface water from the internal accessways and boat storage yard will be managed through a combination of primary (culverts) and secondary (open drains, overland flow paths) stormwater management devices.

Throughout all six stages of the development, all associated primary and secondary stormwater management devices will be formed concurrently with the roadway/ boat yard construction. This supports effective stormwater control, stable overland flow paths, and environmental compliance at every phase of the project.

All stormwater management devices have been designed using NIWA HIRDS v4 rainfall data and the Rational Method (NZBC:E1), including the RCP 6.0 climate change allowance for the year 2100. A Catchment Plan for the Proposed Development and Boat Storage Yard is provided in Appendix H, with supporting calculations in Appendix F.

11.3 Culvert Assessment

The concept design incorporates a total of six culverts for the internal accessways and one for the boat storage yard. These culverts have been designed for the 10 year ARI event. Design discharge velocities have been calculated, identifying locations where additional scour protection at culvert outlets may be required during detailed design.

Further culverts will be required for individual proposed lot crossings over open drains which will be confirmed during detailed design. It is recommended that where proposed driveways cross overland flow paths that culverts and secondary overland flow paths are designed to safely convey the flows.

11.4 Open Swale Drain Assessment

The proposed open swale drains have been sized for a 100-year Average Recurrence Interval (ARI) rainfall event to predict design flows. Manning's Equation was then applied to assess drain capacity and required depths. Where low-level dense vegetation is proposed in the open swale drain a Mannings n value of 0.1 was used to account for the anticipated roughness in the drains associated with the vegetation that is proposed. Open drain locations are depicted on Sheets 07 and 16 of Appendix D, with specific section details on Sheet 22. The assessment confirms the suitability of these drains to convey design flows with suitable measures to protect the open drains from scour and erosion.

11.5 Secondary Flow Assessment

Areas designated for secondary flow over the proposed accessways have been designed using flows derived for the 100-year ARI event. The trapezoidal weir equation (specified in TP10[1]) has been used

[1] Auckland Regional Council. (2003). Stormwater management devices: Design guidelines manual (Technical Publication 10). Auckland Regional Council.

to assess headwater elevations, and velocities over these sections of road have been calculated using Manning's Equation.

Particular attention has been given to the secondary flow path at the intersection of Roadway A and A2, ensuring that secondary flow from Open Drain 5 is fully diverted over Roadway A and into Open Drain 7, preventing flow into Lot 12 and Open Drain 8 (See Sheets 07, and 09 of Appendix D). All secondary flow paths over accessways demonstrate velocity-depth products less than 0.4 m^2/s, thereby complying with the requirements of the FNDC ES 2009.

The low-level, dense vegetation that is shown to protect Open Drain 7 needs to be extended beyond the drain's outlet and down the existing overland flow path to reduce water velocities to levels appropriate for the proposed ground cover. Sheet 07 of Appendix D illustrates the calculated width of this flow path, indicating the necessary extent of additional vegetation.

Where secondary flows re-enter open drains or concentrate down steeper fill batters (areas outside the accessway), velocities may exceed what grass protection can handle. It is recommended that surface water is collected and conveyed in a controlled manner and at the required setback from any wastewater disposal field. Stormwater disposal will require careful consideration so that it does not lead to land instability and erosion.

12 Earthworks

The volumes and areas of earthworks associated with the concept design of the development site and boat storage yard site are summarised in the sections below.

12.1 Concept Design Earthworks

Earthworks will be required on the development site for accessways, open drains, house platforms, and private lot crossings, parking and a stormwater attenuation pond. At the boat storage yard, earthworks are required to form the entrance and create the paved parking and manoeuvring area.

To confirm the suitability of the proposed lots for building, concept earthworks have been included in the design. Minimal earthworks on Proposed Lots 1, 2, 7, 8, 9, and 10, therefore, concept building platforms have not been included for these lots.

We've included earthworks for the crossing and internal manoeuvring for Lot 17, as it was identified as a potentially constrained site for private access.

Table 5 below highlights the total area, volume of cut and fill, and net volumes of earthworks for the concept design. These figures are indicative of the potential earthworks required for the proposed development and subject to refined during detailed design.

Table 5. Earthworks Data

Development Area	Cut Volume (m^3)	Fill Volume (m^3)	Net Volume (m^3) (+CUT/-FILL)
Internal Accessways	1356	923	+433
Private Lots	1390	1697	-307
Boat Storage Yard	990	1025	-35
Possible Attenuation Pond	3300	498	+2802
Total	7036	4143	+2893

It is anticipated the closest distance earthworks are required to the Waiotia Stream is 50 m, based on the concept earthworks design and a potential location for an attenuation pond.

The above works will required NRC approval. Standard mitigation measures under GD-05 are anticipated to be acceptable to mitigate effects, however specific Sediment and Erosion Control Plan/Construction management Plan can be provided at the time of detailed design/prior to construction.

12.2 Earthwork Staging and Cut/Fill Balance Strategy

The 6-stage delivery sequence has been designed to optimise the earthworks balance across the site by staging the earthworks incrementally:

- Cut and fill volumes for the internal accessways will be balanced locally within each stage as much as practical.
- The construction of the Boat Storage Yard requires approximately 1025m³ of fill. By programming the Boat Storage Yard as the final phase (Stage 6), the project can utilise the surplus cut material generated from earlier stages, the excavations from the stormwater attenuation pond in Stage 3 (3300m³ cut), as structural fill for the yard.
- To avoid double-handling and keep the central plateau clear for Stage 3 lot development, this surplus material will be hauled directly to the Boat Storage Yard footprint during Stage 3. It will be used as engineered fill at this site to form the building and parking platform and stabilised under GD-05 guidelines until final shaping and pavement construction in Stage 6.

Table 6. Staging Earthworks Data

Development Area	Cut Volume (m³)	Fill Volume (m³)	Net Volume (m³) (+CUT/-FILL)
Stage 1	423	24	+399
Stage 2	-*	-*	-*
Stage 3	4171	1637	+2534
Stage 4	1396	1194	+202
Stage 5	56	263	-207
Stage 6	990	1025	-35

Note: Stage 2 utilises the Roadway A1 infrastructure completed in Stage 1 and involves minimal lot-specific earthworks, resulting in a net-zero bulk earthworks movement for this specific phase

13 Water Supply

13.1 Potable Water Supply (Water Tanks)

Water supply for each site will be from water collected from building roofs and stored in water tanks.

13.2 Fire Fighting

FNDC ES 2009 require that a water supply is provided that is adequate for firefighting purposes. As discussed above the potable-water supply for the development will be via stored rainwater. The Urban and Rural Fire District maps are not formalised nor are the interim maps publicly available. Given the location of the site, it has been assumed that the site is within a Rural Fire District. This means that the provisions of the New Zealand Fire Service Fire Fighting Water Supplies code of practise SNZ PAS 4509:2008 (PAS4509) are not applicable and are only provided as guidance. The document recommends that the dwellings be fitted with sprinkler systems in rural settings where it is likely that the response time will be greater than 10 minutes.

For a single family home without a sprinkler system, PAS4509 recommends a minimum water storage capacity of 45m^3 within 90m of the dwelling for firefighting purposes where water supply is from a non-reticulated system.

FNDC may accept an alternative sprinkler system designed in accordance with BRANZ document 'Cost-Effective Domestic Fire Sprinkler Systems' (BRANZ, 2000) which provides an alternative to NZS4515:1995 where firefighting sprinkler systems are not required under the Building Code.

As the only requirement is that imposed by the rules within the FNDC's Engineering Standards, it is recommended that provision of water storage for firefighting purposes be assessed by council at the time of a new building consent on each site.

14 Summary of Recommendations

The following recommendations are provided for the proposed subdivision at Tapuaetahi.

14.1 Geotechnical and Earthworks

The site presents geotechnical challenges related to expansive soils, slope stability, and the presence of cobbles/boulders. By addressing these geotechnical constraints early in the design process, they can be effectively managed through appropriate design, earthworks practices, and slope stabilisation measures.

- It is recommended that earthworks undertaken at the site be carried out in accordance with Auckland Council Guidance Document 2016/005: Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05).
- It is recommended that cut slopes are constructed at a maximum slope angle of 1V:2.5H to a maximum height of 1.5m. All cut slopes greater than 1.5m in height are to be engineer assessed by a Chartered Professional Engineer experienced in geotechnical engineering.
- It is recommended that fill slopes are constructed on land sloping at less than 1V:4H at a maximum batter slope of 1V:2.5H to a maximum height of 1.0m. All fill greater than 1.0m in height and/or on land sloping at greater than 1V:4H is to be assessed by a Chartered Professional Engineer experienced in geotechnical engineering.
- It is recommended that further site-specific geotechnical investigations and assessment are undertaken at the time of building consent. This investigation should include (but not be limited to):
  - Low Hazard Area:
    - Subsurface testing (e.g., test pits, boreholes) to assess soil profiles, identify fill material, and evaluate ground conditions.
    - Assessment of soil samples to determine expansivity, bearing capacity, and other relevant properties.
    - Assessment of the presence of cobbles/boulders to inform earthworks and foundation design.
  - Medium Hazard Area:
    - All investigations listed for Low Hazard Areas.
    - Stability analysis of slopes to assess the risk of slippage and recommend appropriate mitigation measures (if required).

  - High Hazard Area:
    - Subsurface testing (expected to comprise all investigations listed for a Low Hazard Area, plus machine boreholes and/or Cone Penetration Tests) to assess soil profiles, identify fill material and evaluate ground conditions.
    - Stability analysis of slopes to assess the risk of slippage and recommend appropriate mitigation measures (if required).

- It is recommended that any development, filling or construction of structures within the medium and high stability hazard extents will need to be subject to specific geotechnical assessment undertaken by a Chartered Professional Engineer experienced in geotechnical engineering.
  - Appropriate stabilisation measures, such as retaining walls, ground anchors, or other engineering solutions, may be required in areas with higher instability risk.
- It is recommended that bulk earthworks for individual building platforms generally be undertaken by future lot owners at the building consent stage to minimise site-wide earthwork footprints.
- It is recommended that the specific land improvements (earthworks and retaining structures) required for Lot 17 be completed by the developer during Stage 4 of the subdivision works for this constrained site.
- It is recommended that all stage-specific temporary works, such as the temporary WWTP accessway constructed in Stage 1, are managed under GD-05 erosion and sediment control measures to prevent sediment runoff during interim phases.

14.2 Wastewater

Based on the findings of this assessment, the proposed on-site wastewater management system is considered feasible for the development. A consenting pathway could include a process for the applicant while managing regulatory requirements.

It is recommended that the resource consent be granted with conditions that link its commencement to subsequent approvals from the Northland Regional Council (NRC) and the FNDC building consent authority. This report provides the technical justification for the following recommended consent conditions:

- **Commencement of Consent**: Refer to Section 9.2.2.2 for recommended consent conditions.
- **Council Right of Review**: A condition giving FNDC the right to review the consent conditions pursuant to Section 128 of the Resource Management Act 1991 should unforeseen issues arise from the related NRC consenting process.
- **Easements**: A condition requiring that, prior to the issue of a Section 223 certificate, all necessary easements be created and registered in favour of the proposed lots to grant them the right to convey and discharge wastewater via the communal system.
- **Consent Notice**: A condition requiring a consent notice to be registered on the titles of the proposed lots, specifying that each dwelling must connect to the communal wastewater system and that the on-lot treatment system must achieve a tertiary treatment standard.

It is recommended that the installation of the wastewater reticulation network be approved as a two-phase process to align with the 6-stage subdivision delivery. Phase 1 (installed during Stage 1) must be operational prior to the issuing of Section 224(c) certificates for Lots 1-12. Phase 2 (installed during Stage 4) must be operational prior to the issuing of Section 224(c) certificates for the remaining Lots 13-20.

It is recommended that the temporary accessway to the WWTP constructed during Stage 1 is maintained and stable for service vehicles until the permanent Roadway A alignment is completed over this section in Stage 3.

14.3 Stormwater

- Stormwater attenuation for each lot be designed by a Chartered Professional Engineer for a 10% AEP storm event, including climate change allowances. The design should attenuate runoff from 150% of the building roof area to account for driveways and other hardstand surfaces
- Runoff from the modified Catchment B be attenuated. The attenuation system should be designed by a chartered professional engineer to reduce the peak discharge at Point B back to its calculated pre-development rate for a 1% AEP storm event, with allowance for climate change.
- Where proposed driveways cross overland flow paths that culverts and secondary overland flow paths are designed to safely convey the flows.
- Surface water is collected and conveyed in a controlled manner and at the required setback from any wastewater disposal fields. Stormwater disposal will require careful consideration so that it does not lead to land instability.
- It is recommended that the bulk earthworks and formation of the Catchment B stormwater attenuation pond be completed during Stage 3 of the subdivision works. This approach mitigates peak flows whilst the central plateau is developed and allows the excavated material to be used for the Stage 4 roadway extensions and the Stage 6 Boat Storage Yard.
- It is recommended that all primary stormwater controls (roadway culverts) and secondary flow paths (open swale drains) are constructed and stabilised concurrently with the roadway formation in each respective stage to ensure continuous stormwater management as the site is developed.

14.4 Internal Access and Boat Storage Yard

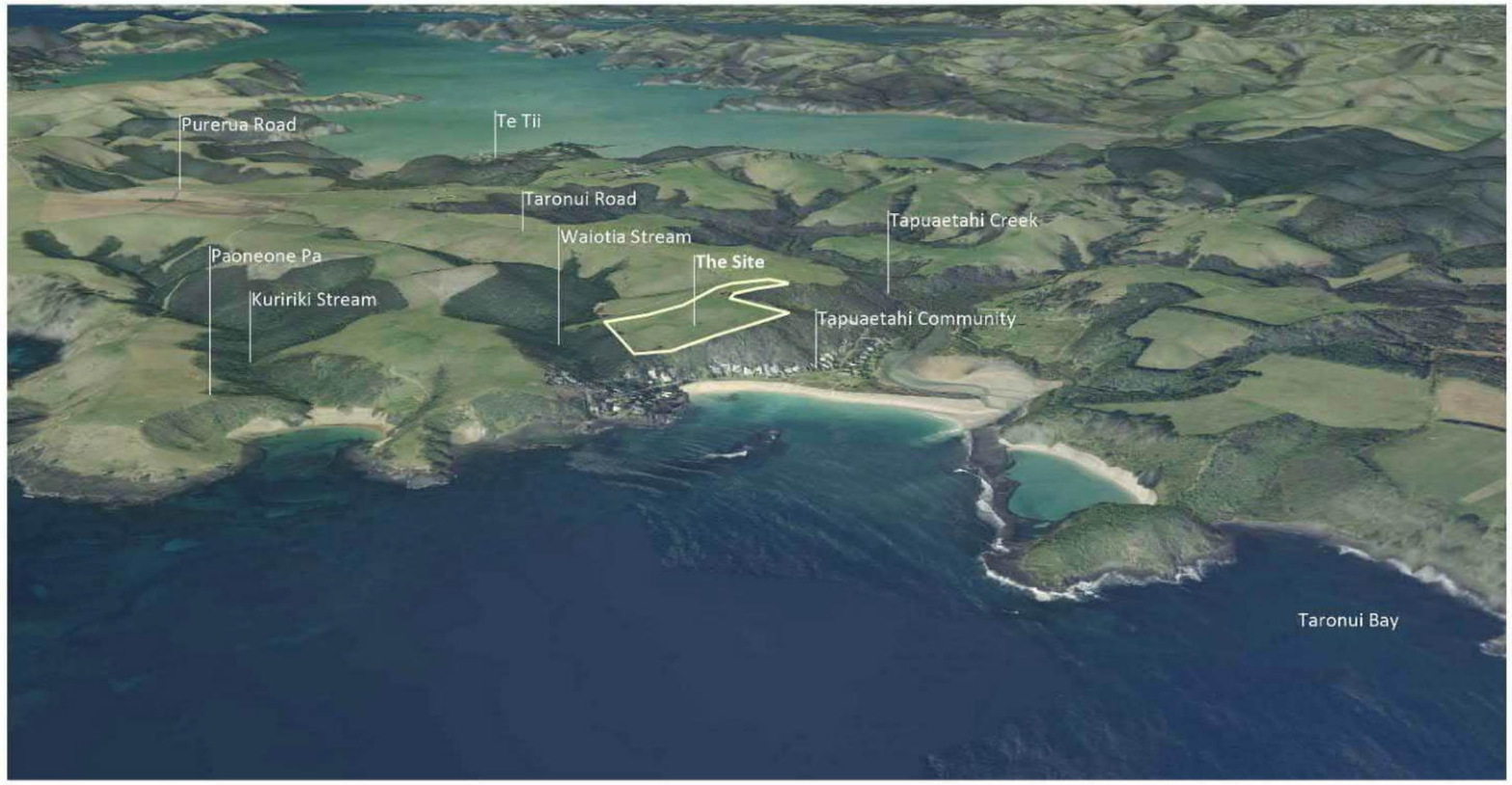
- It is recommended that subgrade testing is carried out during detailed design and/or as part of construction to confirm the CBR values and validate the pavement design assumptions (CBR ≥ 7).
- It is recommended that the internal accessways be constructed incrementally across Stages 1 to 5 as outlined in this addendum to balance cut-to-fill earthworks within each stage and minimise the extent of exposed soils.
- It is recommended that the temporary accessway constructed in Stage 1 (Chainage 90m to 250m) be removed/ replaced with the permanent accessway during Stage 3.
- It is recommended that the Boat Storage Yard be constructed in the final phase (Stage 6) to utilise the surplus cut material generated from the Stage 3 stormwater attenuation pond excavation as the necessary structural fill for the yard. This surplus material could be hauled directly to the Boat Storage Yard as engineered fill

15 Conclusions

Provided the recommendations given in this report are adhered to, the subject site is considered to be suitable for the proposed subdivision depicted on the attached Littoralis overall site plan.

Appendix A
Littoralis Landscape Architecture
Overall Site Plan

PREPARED FOR TAPUAETAHI INCORPORATION



LANDSCAPE INTEGRATION CONCEPT

TAPUAETAHI SUBDIVISION
RC APPLICATION 2026

Ref: 1348_LIC_20260316

LITTORALIS
LANDSCAPE ARCHITECTURE

Note: Design contours shown at 0.5m intervals, prepared by Vision Consulting Engineers Ltd. For geothechnical site analysis and storm/waste water design refer to documentation by Vision Consulting Engineers Ltd.

Margin of coastal flank vegetation, initiate long-term weed management. Progressively replace weed species with indigenous, coastal species.

Approx. position of existing tsunami siren

OH power

Tarohui Road

Planting atop fill mound up to 3m high

Indicative fence along northern edge of farm/quarry track

GENERAL COASTAL ZONE
COASTAL LIVING ZONE

Legend

- Proposed new lot boundaries
- Proposed building envelope
- Indicative building shown 200m² Single storey Maximum height 5m
- Indicative building shown Two storey/stepped Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas
- (1) Secure boat compound 15 covered storage spaces 8 uncovered storage spaces
- (2) Automatic sliding gate
- (3) Secondary waste water treatment plant
- (4) Storage sheds for dinghies, kayaks and beach equipment
- (5) Indicative walking track route
- (6) Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high
- Low indigenous planting up to 1.5m high

Note: Only low flammability shrub and tree species within 10m of building areas.

0 25 50 m

Scale @A3	Project No.	Drawing No.	Rev	Date
1 : 2000	1374	LLA002	A	16/03/2026

CAD REF.: 1371_Tapuaetahi_20251210.vwx

Client: TAPUAETAHI INCORPORATION

Project Title: **TAPUAETAHI SUBDIVISION**

Title: **RC APPLICATION 2026**

Sheet Title: **OVERALL SITE PLAN**

LITTORALIS LANDSCAPE ARCHITECTURE

Legend

- Proposed building envelope
- Indicative building shown 200m² Single storey Maximum height 5m
- Indicative building shown Two storey/stepped Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas
- (1) Secure boat compound See following sheet
- (2) Automatic sliding gate
- (3) Secondary waste water treatment plant
- (4) Storage sheds for dinghies, kayaks and beach equipment
- (5) Indicative walking track route
- (6) Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high

Scale @A3	Project No.	Drawing No.	Rev	Client	Project Title	Title
1 : 1000	1374	LLA003	A	TAPUAETAHI INCORPORATION	TAPUAETAHI SUBDIVISION	RC APPLICATION 2026

0 25 50 m

Date: 16/03/2026

Sheet Title: DETAILED SITE PLAN 1

CAD REF.: 1371_Tapuaetahi_20251210.vwx

LITTORALIS LANDSCAPE ARCHITECTURE

Legend

- Proposed building envelope
- Indicative building shown 200m² Single storey Maximum height 5m
- Indicative building shown Two storey/stepped Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas
- (1) Secure boat compound 15 covered storage spaces 8 uncovered storage spaces
- (2) Automatic sliding gate
- (3) Secondary waste water treatment plant
- (4) Storage sheds for dinghies, kayaks and beach equipment
- (5) Indicative walking track route
- (6) Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high

Scale @A3	Project No.	Drawing No.	Rev	Client	Project Title	Title
1 : 500	1374	LLA004	A	TAPUAETAHI INCORPORATION	TAPUAETAHI SUBDIVISION	RC APPLICATION 2026
			Date 16/03/2026			Sheet Title DETAILED SITE PLAN 2

0 25 50 m

CAD REF.: 1371_Tapuaetahi_20251210.vwx

LITTORALIS LANDSCAPE ARCHITECTURE

Proposed staging

- Proposed lot boundaries
- **Stage 1**: Lots 1, 2, 3
- **Stage 2**: Lots 7, 8, 9, 10
- **Stage 3**: Lots 4, 5, 6, 11, 12, 15 and formation of the stormwater pond
- **Stage 4**: Lots 13, 16, 17, 19, 20
- **Stage 5**: Lots 14, 18
- **Stage 6**: Boat storage compound

Scale @A3	Project No.	Drawing No.	Rev	Client	Project Title	Title
as shown	1374	LLA005	A	TAPUAETAHI INCORPORATION	TAPUAETAHI SUBDIVISION	RC APPLICATION 2026
			Date 16/03/2026			Sheet Title STAGING PLAN

0 25 50 m

CAD REF.: 1371_Tapuaetahi_20251210.vwx

LITTORALIS LANDSCAPE ARCHITECTURE

Appendix B
VISION Field Logs

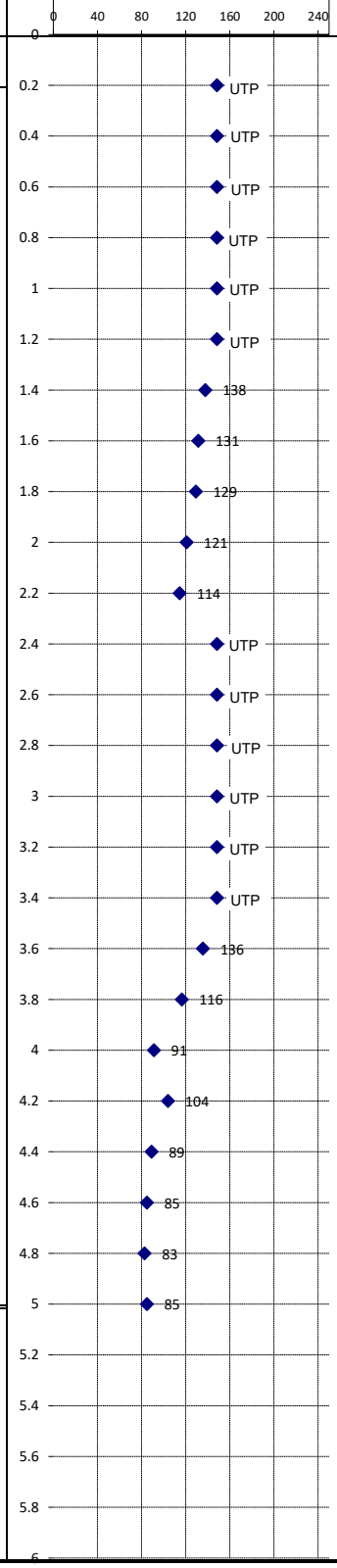
VISION CONSULTING ENGINEERS

BOREHOLE LOG

BOREHOLE No: BH1

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	HM
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			M	Clayey SILT, trace fine to coarse sand; pale brown, trace rootlets	TOPSOIL
0.1					
0.2		VSt	M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel; pale orange	KERIKERI VOLCANIC GROUP
0.3				brown, high plasticity	
0.4					
0.5				some fine to medium subangular gravel, becoming brownish orange, trace white	
0.6					
0.7				trace fine subangular gravel, brownish orange	
0.8					
0.9					
1.0					
1.1					
1.2				brown	
1.3					
1.4		VSt	M	Clayey SILT, trace fine to coarse sand; reddish brown, trace grey, medium plasticity	
1.5					
1.6					
1.7					
1.8					
1.9					
2.0					
2.1					
2.2					
2.3					
2.4		VSt	M	Clayey SILT; brown, trace orange, medium plasticity	
2.5					
2.6				with some orange, trace grey	
2.7					
2.8					
2.9					
3.0					
3.1					
3.2					
3.3					
3.4					
3.5					
3.6		St-VSt	VM	Clayey SILT; mottled brown with reddish orange and dark grey, trace white,	
3.7				medium plasticity	
3.8					
3.9					
4.0					
4.1					
4.2					
4.3					
4.4		St			
4.5					
4.6				greyish brown, with some grey, trace pale orange	
4.7					
4.8					
4.9					
5.0				End of hole at 5.0 m bgl	
5.1				Target depth achieved	
5.2				Groundwater not encountered	
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

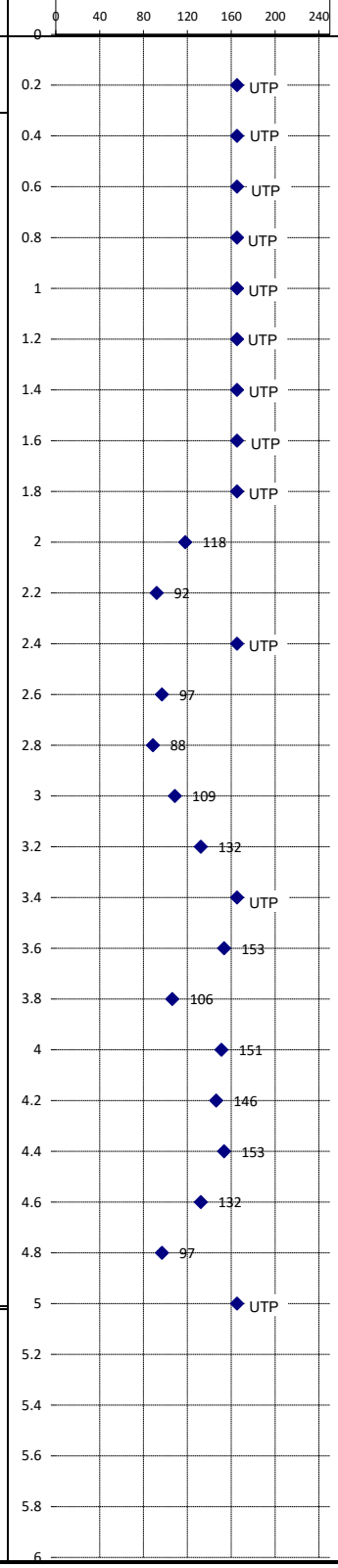
VISION CONSULTING ENGINEERS

BOREHOLE LOG

BOREHOLE No: BH2

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	SW
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			M	Clayey SILT, trace fine to coarse sand; brown, trace rootlets	TOPSOIL
0.1					
0.2					
0.3		VSt	M	Clayey SILT, trace fine to coarse sand, trace fine to coarse subangular gravel;	KERIKERI VOLCANIC GROUP
0.4				pale brown, trace reddish orange	
0.5					
0.6					
0.7					
0.8				brownish orange, trace white	
0.9					
1.0				orange, trace pink, trace white	
1.1					
1.2					
1.3					
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					
2.0					
2.1					
2.2		St-VSt	M	Clayey SILT, trace fine sand; mottled brownish orange with grey, trace white,	
2.3				moderate plasticity	
2.4					
2.5					
2.6					
2.7					
2.8					
2.9					
3.0					
3.1					
3.2					
3.3					
3.4					
3.5					
3.6					
3.7					
3.8					
3.9					
4.0					
4.1					
4.2					
4.3					
4.4				reddish brown	
4.5					
4.6					
4.7					
4.8				brown	
4.9					
5.0				End of hole at 5.0 m bgl	
5.1				Target depth achieved	
5.2				Groundwater not encountered	
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

VISION CONSULTING ENGINEERS

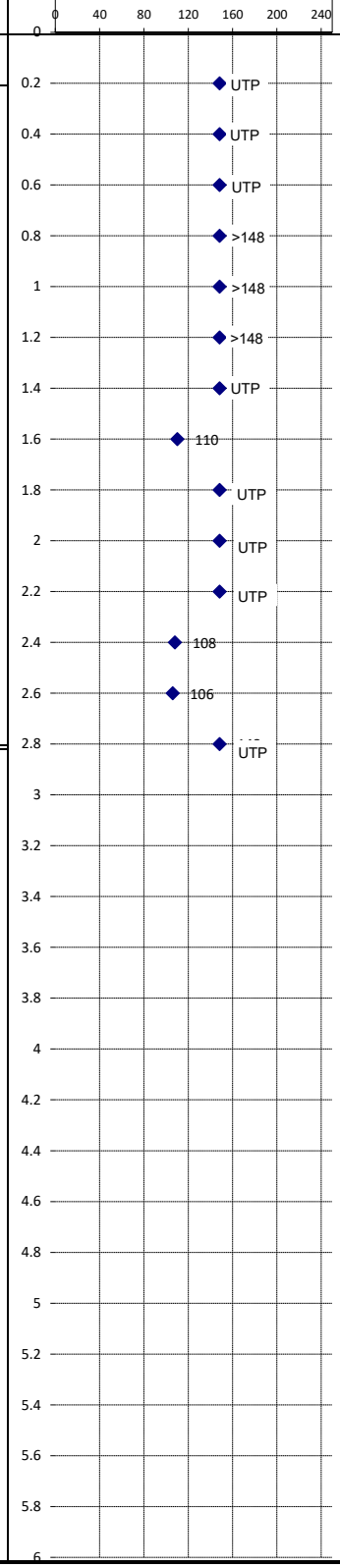
BOREHOLE LOG

BOREHOLE No: BH3

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	HM
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			M	Clayey SILT, trace fine to coarse sand, with some fine to medium	TOPSOIL
0.1				subangular gravel; brown, trace rootlets	
0.2		VSt	M	Clayey SILT, trace fine to coarse sand, with some fine to medium	KERIKERI VOLCANIC GROUP
0.3				subangular gravel; pale brown, trace orange	
0.4					
0.5					
0.6					
0.7					
0.8				trace white	
0.9					
1.0				becoming brownish orange	
1.1					
1.2				pale orangish brown with pale grey, trace orange	
1.3					
1.4					
1.5			VM	orangish brown, trace white, trace reddish brown	
1.6					
1.7					
1.8					
1.9					
2.0					
2.1					
2.2				reddish brown	
2.3					
2.4					
2.5					
2.6					
2.7					
2.8				End of hole at 2.8 m bgl	
2.9				Effective refusal at 2.8m bgl	
3.0				Target depth not achieved	
3.1				Groundwater not encountered	
3.2					
3.3					
3.4					
3.5					
3.6					
3.7					
3.8					
3.9					
4.0					
4.1					
4.2					
4.3					
4.4					
4.5					
4.6					
4.7					
4.8					
4.9					
5.0					
5.1					
5.2					
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					

Undrained Shear Strength (kPa)



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

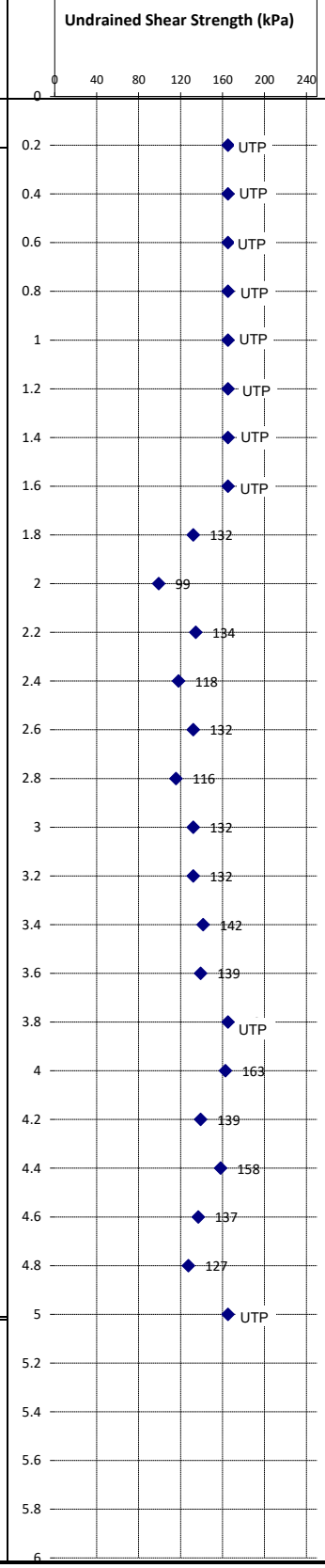
VISION CONSULTING ENGINEERS

BOREHOLE LOG

BOREHOLE No: BH4

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	SW
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			M	Clayey SILT, trace fine sand, trace fine subrounded gravel; dark brown,	TOPSOIL
0.1				trace rootlets	
0.2		VSt	M	Silty CLAY, trace fine to coarse sand, trace fine subangular gravel; brown,	KERIKERI VOLCANIC GROUP
0.3				trace reddish brown, high plasticity	
0.4					
0.5					
0.6					
0.7					
0.8				becoming reddish brown	
0.9					
1.0				reddish brown	
1.1					
1.2				brown	
1.3					
1.4					
1.5					
1.6				with some pale orange, trace grey	
1.7					
1.8					
1.9					
2.0		St			
2.1					
2.2		VSt			
2.3					
2.4		VSt	M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel; reddish brown,	
2.5				trace white, grey and pale orange, medium to high plasticity	
2.6					
2.7					
2.8					
2.9					
3.0					
3.1					
3.2					
3.3					
3.4					
3.5					
3.6				with some greyish brown	
3.7					
3.8					
3.9					
4.0			VM	pale orangish brown, trace grey brown	
4.1					
4.2					
4.3					
4.4					
4.5					
4.6					
4.7					
4.8					
4.9					
5.0				End of hole at 5.0 m bgl	
5.1				Target depth achieved	
5.2				Groundwater not encountered	
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

VISION CONSULTING ENGINEERS

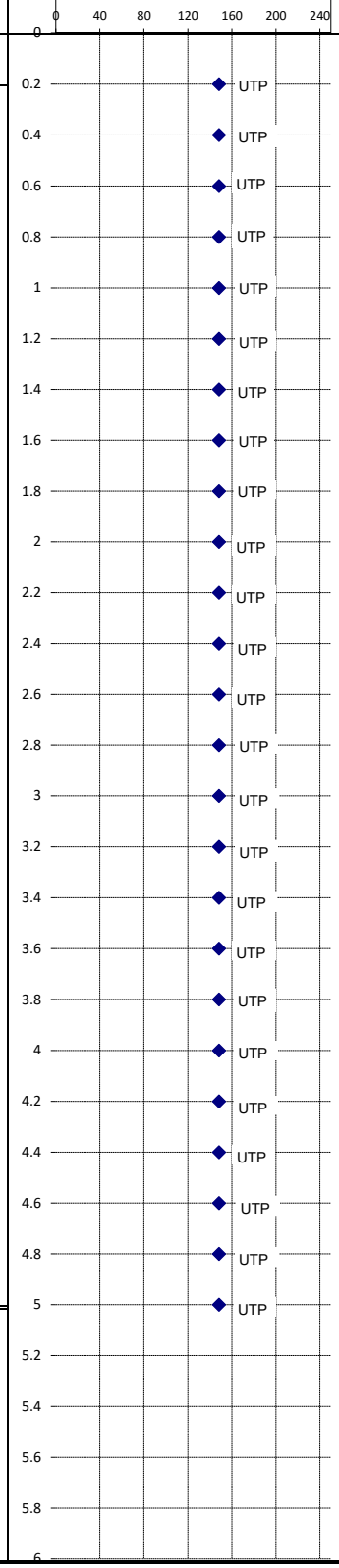
BOREHOLE LOG

BOREHOLE No: BH5

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	HM
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel; trace rootlets	TOPSOIL
0.1					
0.2		VSt	M	Silty CLAY, trace fine to coarse sand, trace fine subangular gravel; brown,	KERIKERI VOLCANIC GROUP
0.3				trace reddish brown, high plasticity	
0.4					
0.5					
0.6					
0.7					
0.8				becoming orangish brown	
0.9					
1.0					
1.1					
1.2				orangish brown	
1.3					
1.4					
1.5					
1.6		VSt	M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel;	
1.7				orangish brown, with orange and some grey, medium plasticity	
1.8					
1.9					
2.0					
2.1					
2.2					
2.3					
2.4				trace pink, trace black	
2.5					
2.6					
2.7					
2.8					
2.9					
3.0					
3.1					
3.2					
3.3					
3.4					
3.5					
3.6					
3.7					
3.8					
3.9					
4.0					
4.1					
4.2			VM		
4.3					
4.4					
4.5					
4.6					
4.7					
4.8					
4.9					
5.0				End of hole at 5.0 m bgl	
5.1				Target depth achieved	
5.2				Groundwater not encountered	
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					

Undrained Shear Strength (kPa)



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

VISION CONSULTING ENGINEERS

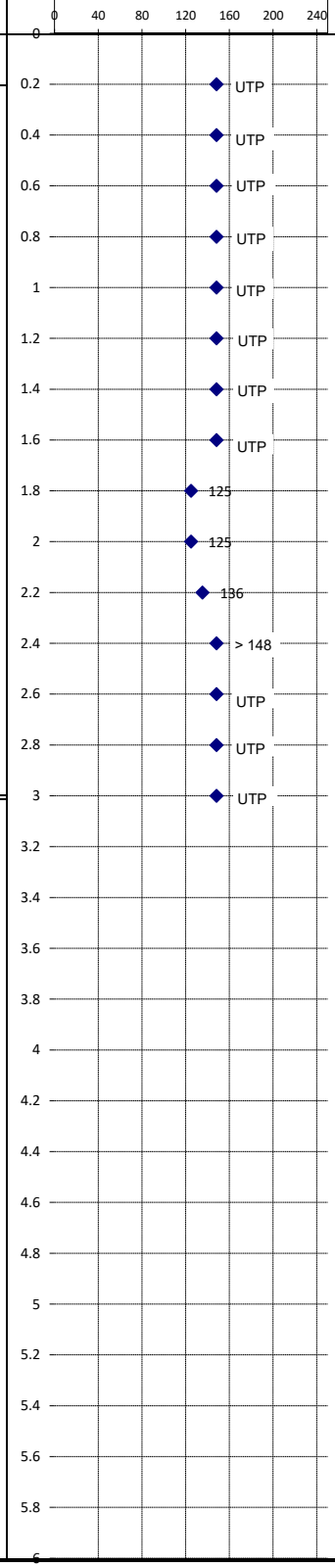
BOREHOLE LOG

BOREHOLE No: BH6

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	SW
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			M	Clayey SILT, trace fine sand, with some subangular gravel; dark brown,	TOPSOIL
0.1				trace rootlets	
0.2		VSt	M	Clayey SILT, trace fine sand, with some fine angular gravel; brown	KERIKERI VOLCANIC GROUP
0.3				medium plasticity	
0.4					
0.5					
0.6					
0.7					
0.8				trace dark brown, high plasticity	
0.9					
1.0					
1.1					
1.2					
1.3					
1.4					
1.5					
1.6				reddish brown, trace grey	
1.7					
1.8					
1.9					
2.0					
2.1					
2.2					
2.3					
2.4					
2.5					
2.6				trace subrounded gravel, trace grey and red, medium plasticity	
2.7					
2.8					
2.9					
3.0				End of hole at 3.0 m bgl	
3.1				Target depth achieved	
3.2				Groundwater not encountered	
3.3					
3.4					
3.5					
3.6					
3.7					
3.8					
3.9					
4.0					
4.1					
4.2					
4.3					
4.4					
4.5					
4.6					
4.7					
4.8					
4.9					
5.0					
5.1					
5.2					
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					

Undrained Shear Strength (kPa)



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

VISION CONSULTING ENGINEERS

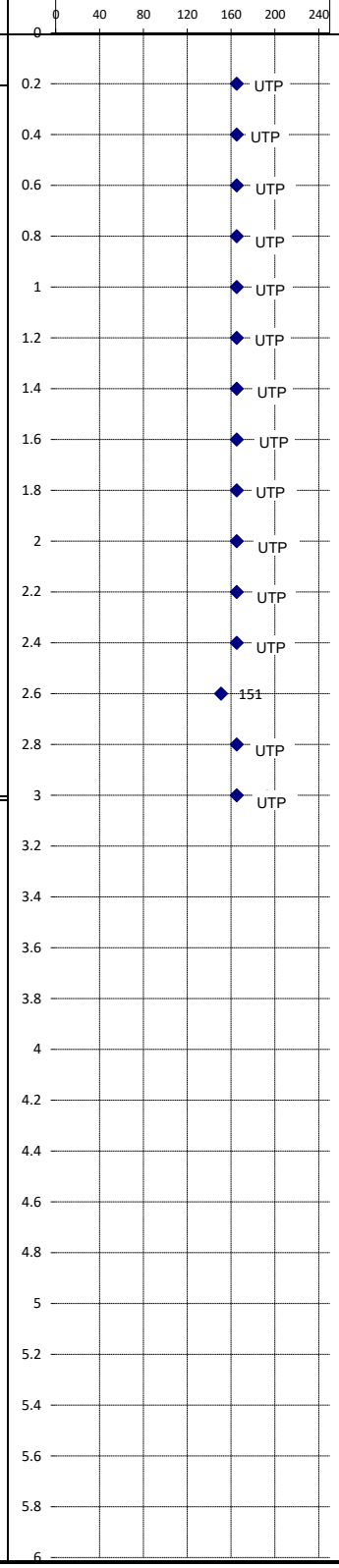
BOREHOLE LOG

BOREHOLE No: BH7

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	SW
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0				Clayey SILT, trace fine to coarse sand, with some angular gravel; dark brown,	TOPSOIL
0.1				trace rootlets	
0.2		VSt	M	Clayey SILT, with some fine sand, trace fine subangular gravel; orangish brown,	KERIKERI VOLCANIC GROUP
0.3				trace brown, high plasticity	
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					
1.1					
1.2				trace grey, trace reddish brown	
1.3					
1.4					
1.5					
1.6					
1.7					
1.8		VSt	M	Clayey SILT, trace fine to coarse sand, trace subangular gravel;	
1.9				mottled grey brown, with reddish brown, high plasticity	
2.0				pale orangish brown, trace grey	
2.1					
2.2			VM	ground water seepage	
2.3					
2.4					
2.5					
2.6					
2.7					
2.8				with some pale grey	
2.9					
3.0				End of hole at 3.0 m bgl	
3.1				Target depth achieved	
3.2				Groundwater seepage at 2.2 m bgl	
3.3				No ground water present in borehole prior to leaving site	
3.4					
3.5					
3.6					
3.7					
3.8					
3.9					
4.0					
4.1					
4.2					
4.3					
4.4					
4.5					
4.6					
4.7					
4.8					
4.9					
5.0					
5.1					
5.2					
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					

Undrained Shear Strength (kPa)



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

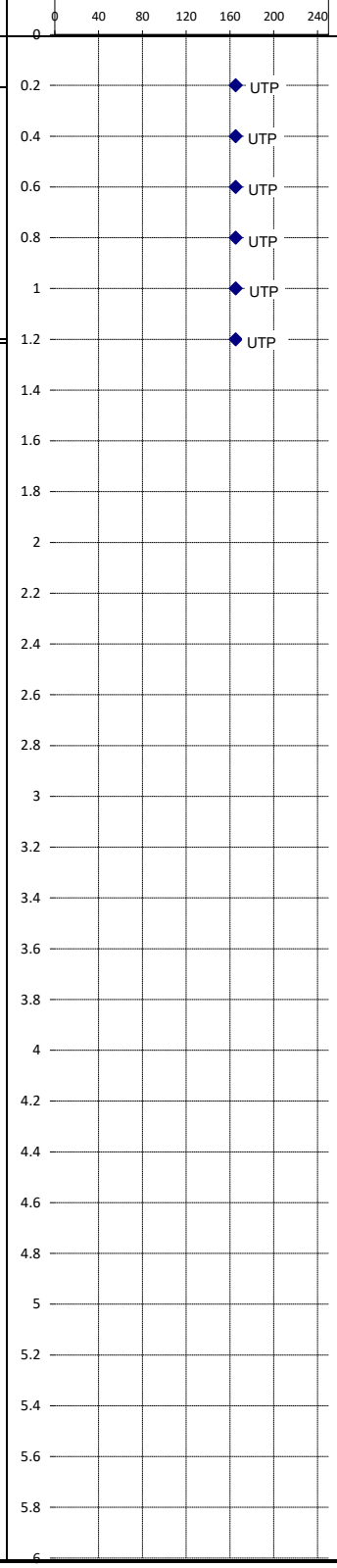
VISION CONSULTING ENGINEERS

EXPOSURE LOG

BOREHOLE No: EXP 1

Client: Tapuaetahi Development	**Project:** Feasibility Engineering Assessment	**VISION Project No.:**	J15724
Project Location: Tapuaetahi Development	**Borehole Location:** Refer to site plan	**Hole started:**	21/05/2025
		Hole completed:	21/05/2025
Drill method: 50mm Hand Auger		**Drilled by:**	HM
		Checked by:	DS

Depth (m)	Graphic	Strength	Moisture	Soil Description	GEOLOGY & additional observations
0.0			D-M	Clayey SILT, trace fine to coarse sand, with some fine to medium subangular	TOPSOIL
0.1				trace rootlets, subrounded gravel; brown, trace rootlets	
0.2		VSt	M	Clayey SILT, trace fine to coarse sand, trace fine subangular to subrounded gravel	KERIKERI VOLCANIC GROUP
0.3				high plasticity	
0.4				trace pale orange	
0.5					
0.6				pale orange brown, trace reddish brown	
0.7					
0.8					
0.9					
1.0					
1.1			VM	ground water seepage	
1.2				End of exposure log at 1.2 m bgl	
1.3				Groundwater seepage at 1.1 m bgl	
1.4					
1.5					
1.6					
1.7					
1.8					
1.9					
2.0					
2.1					
2.2					
2.3					
2.4					
2.5					
2.6					
2.7					
2.8					
2.9					
3.0					
3.1					
3.2					
3.3					
3.4					
3.5					
3.6					
3.7					
3.8					
3.9					
4.0					
4.1					
4.2					
4.3					
4.4					
4.5					
4.6					
4.7					
4.8					
4.9					
5.0					
5.1					
5.2					
5.3					
5.4					
5.5					
5.6					
5.7					
5.8					
5.9					



Notes: Shear strength lines are indicative only.
Shear strength calibrated and adjusted for plasticity

BOREHOLE LOG - INV1

VISION CONSULTING ENGINEERS

Client: Tapuaetahi Incorporation	**Tapuaetahi Development**	**Project No.: J15724**
Project Location: Tapuaetahi Devleopement	**Borehole Location:** See Wastewater Plan	**Drilled by:** HM **Logged by:** HM
Hole started: 21/05/2025 **Hole completed:** 21/05/2025	**Drill method:** 50mm handauger	

Depth (m)	Graphic	Moisture	Soil Description	**Geology** & other notes
0.00		M	Clayey SILT, trace fine sand, trace fine subangular gravel; dark brown, trace rootlets	TOPSOIL
0.05				
0.10		M	Clayey SILT, trace fine sand, trace fine subangular gravel; brown	KERIKERI VOLCANIC GROUP
0.15				
0.20				
0.25				
0.30				
0.35				
0.40			pale brown	
0.45				
0.50				
0.55				
0.60				
0.65				
0.70				
0.75				
0.80				
0.85				
0.90				
0.95				
1.00				
1.05				
1.10				
1.15				
1.20			End of hole at 1.2m bgl	
1.25			Groundwater not encountered	
1.30			Target depth achieved	
1.35				
1.40				
1.45				
1.50				
1.55				
1.60				
1.65				
1.70				
1.75				
1.80				
1.85				
1.90				
1.95				
2.00				
2.05				
2.10				
2.15				
2.20				
2.25				
2.30				
2.35				
2.40				
2.45				
2.50				
2.55				
2.60				
2.65				
2.70				
2.75				
2.80				
2.85				
2.90				
2.95				

BOREHOLE LOG - INV2

VISION CONSULTING ENGINEERS

Client: Tapuaetahi Incorporation	**Tapuaetahi Development**	**Project No.: J15724**
Project Location: Tapuaetahi Devleopement	**Borehole Location:** See Wastewater Plan	**Drilled by:** HM **Logged by:** HM
Hole started: 21/05/2025 **Hole completed:** 21/05/2025	**Drill method:** 50mm handauger	

Depth (m)	Graphic	Moisture	Soil Description	**Geology** & other notes
0.00		M	Clayey SILT, trace fine sand, trace fine subangular gravel; dark brown, trace rootlets	TOPSOIL
0.20			Silty CLAY, trace fine sand; pale orange brown	KERIKERI VOLCANIC GROUP
1.00			pale orange	
1.20			End of hole at 1.2m bgl Groundwater not encountered Target depth achieved	

BOREHOLE LOG - INV3

Client: Tapuaetahi Incorporation	**Tapuaetahi Development**	**Project No.: J15724**	
Project Location: Tapuaetahi Devleopement	**Borehole Location:** See Wastewater Plan	**Drilled by:**	HM
		Logged by:	HM
Hole started: 21/05/2025	**Drill method:** 50mm handauger		
Hole completed: 21/05/2025			

VISION CONSULTING ENGINEERS

Depth (m)	Graphic	Moisture	Soil Description	**Geology** & other notes
0.00		M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel; dark brown, trace rootlets	TOPSOIL
0.05				
0.10		M	Silty CLAY, trace fine sand; pale orange brown	KERIKERI VOLCANIC GROUP
0.15				
0.20				
0.25				
0.30				
0.35				
0.40			pale orange	
0.45				
0.50				
0.55				
0.60				
0.65				
0.70				
0.75				
0.80				
0.85				
0.90				
0.95				
1.00				
1.05				
1.10				
1.15				
1.20			End of hole at 1.2m bgl	
1.25			Groundwater not encountered	
1.30			Target depth achieved	
1.35				
1.40				
1.45				
1.50				
1.55				
1.60				
1.65				
1.70				
1.75				
1.80				
1.85				
1.90				
1.95				
2.00				
2.05				
2.10				
2.15				
2.20				
2.25				
2.30				
2.35				
2.40				
2.45				
2.50				
2.55				
2.60				
2.65				
2.70				
2.75				
2.80				
2.85				
2.90				
2.95				

BOREHOLE LOG - INV4

VISION CONSULTING ENGINEERS

Client: Tapuaetahi Incorporation	**Tapuaetahi Development**	**Project No.: J15724**
Project Location: Tapuaetahi Devleopement	**Borehole Location:** See Wastewater Plan	**Drilled by:** HM **Logged by:** HM
Hole started: 21/05/2025 **Hole completed:** 21/05/2025	**Drill method:** 50mm handauger	

Depth (m)	Graphic	Moisture	Soil Description	**Geology** & other notes
0.00		M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel; brown, trace rootlets	TOPSOIL
0.05				
0.10		M	Clayey SILT, trace fine to coarse sand, trace fine subrounded gravel; pale brown	KERIKERI VOLCANIC GROUP
0.15				
0.20				
0.25				
0.30				
0.35				
0.40				
0.45				
0.50				
0.55				
0.60			trace grey	
0.65				
0.70				
0.75				
0.80				
0.85				
0.90				
0.95				
1.00				
1.05				
1.10				
1.15				
1.20			End of hole at 1.2m bgl	
1.25			Groundwater not encountered	
1.30			Target depth achieved	
1.35				
1.40				
1.45				
1.50				
1.55				
1.60				
1.65				
1.70				
1.75				
1.80				
1.85				
1.90				
1.95				
2.00				
2.05				
2.10				
2.15				
2.20				
2.25				
2.30				
2.35				
2.40				
2.45				
2.50				
2.55				
2.60				
2.65				
2.70				
2.75				
2.80				
2.85				
2.90				
2.95				

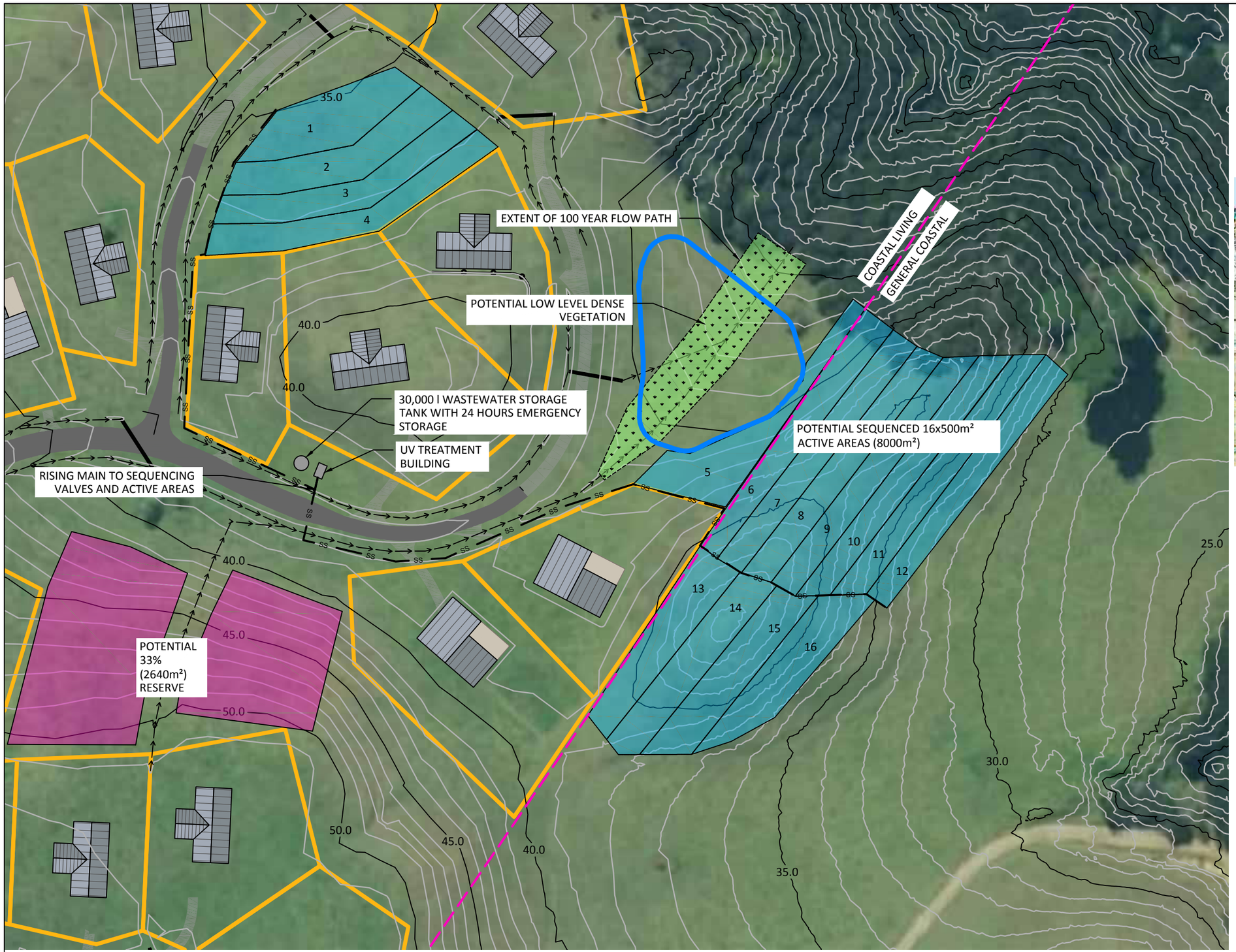
BOREHOLE LOG - INV5

VISION CONSULTING ENGINEERS

Client: Tapuaetahi Incorporation	**Tapuaetahi Development**	**Project No.: J15724**
Project Location: Tapuaetahi Devleopement	**Borehole Location:** See Wastewater Plan	**Drilled by:** HM **Logged by:** HM
Hole started: 21/05/2025 **Hole completed:** 21/05/2025	**Drill method:** 50mm handauger	

Depth (m)	Graphic	Moisture	Soil Description	**Geology** & other notes
0.00		M	Clayey SILT, trace fine to coarse sand, trace fine subangular gravel; dark brown, trace rootlets	TOPSOIL
0.05				
0.10		M	Clayey SILT, trace fine sand, trace fine subrounded gravel; brown	KERIKERI VOLCANIC GROUP
0.15				
0.20				
0.25				
0.30				
0.35				
0.40				
0.45				
0.50				
0.55				
0.60				
0.65				
0.70				
0.75				
0.80				
0.85				
0.90				
0.95				
1.00			orangish brown	
1.05				
1.10				
1.15				
1.20			End of hole at 1.2m bgl	
1.25			Groundwater not encountered	
1.30			Target depth achieved	
1.35				
1.40				
1.45				
1.50				
1.55				
1.60				
1.65				
1.70				
1.75				
1.80				
1.85				
1.90				
1.95				
2.00				
2.05				
2.10				
2.15				
2.20				
2.25				
2.30				
2.35				
2.40				
2.45				
2.50				
2.55				
2.60				
2.65				
2.70				
2.75				
2.80				
2.85				
2.90				
2.95				

Appendix C
VISION Wastewater Plan



NOTE:

1. SITE FEATURES ARE BASED ON VISIONS CONCEPT CIVIL DESIGN REF J15724.
2. 1.0m CONTOURS ARE A COMBINATION OF VISION'S CONCEPT FINISHED GROUND SURFACE BASED ON WILLIAMS AND KING TOPOGRAPHIC SURVEY DATED 08/2017 AND NRC 1.0 m LiDAR DEM FLOWN IN 2018 WITH REFERENCE TO OPT 1964 VERTICAL DATUM.
3. LINZ AERIAL IMAGE

0 10 20 30 40 50

Scale 1:1000 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: TAPUAETAHI DEVELOPMENT
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: PROPOSED WASTEWATER PLAN

			VALUE
SURVEY			
DESIGN	HM	17/07/2025	
DRAWN	HM	17/07/2025	
CHECKED	BCP	01/08/2025	
APPROVED	BCP	01/08/2025	

No	REVISION	BY	DATE

SCALE 1:1000
SHEET 1 OF 1
PROJECT J15724
REV -

Appendix D
VISION Concept Design Drawing

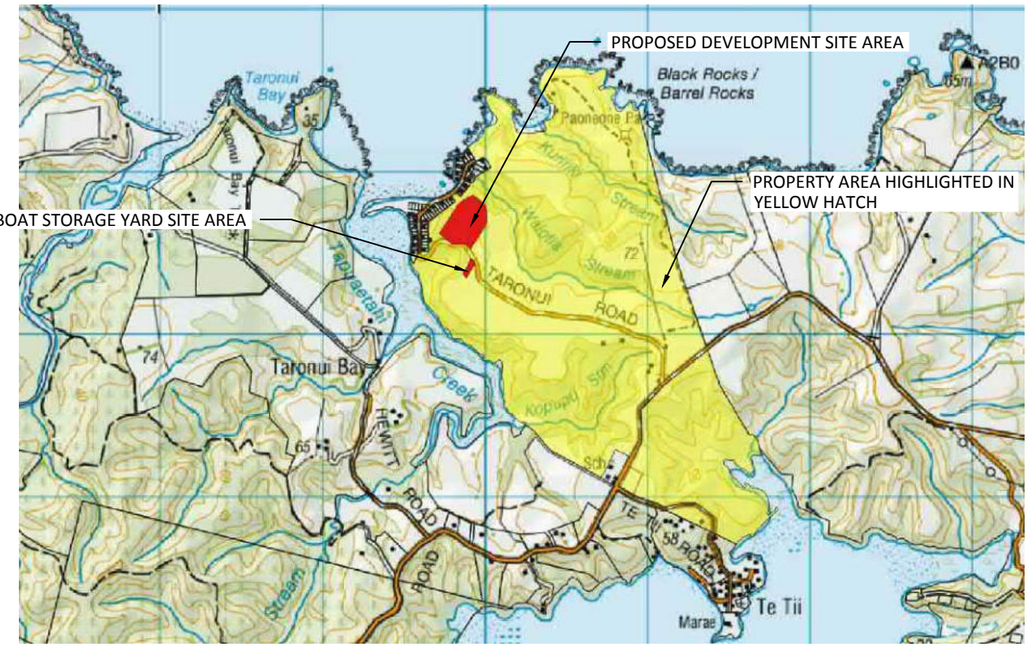
VISION CONSULTING ENGINEERS

CONCEPT CIVIL DESIGN

LOT 1 DP 184896

TAPUAETAHI

Client: TAPUAETAHI INCORPORATION



LOCALITY

SCALE (A3) NTS

CONTENTS

SHEET	DESCRIPTION	ISSUE DATE	STATUS	REVISION
1	COVER SHEET AND LOCALITY	16/07/2025	FOR RC	A
2	PROPOSED DEVELOPMENT AND BOAT STORAGE YARD OVERVIEW PLAN	16/07/2025	FOR RC	A
3	PROPOSED DEVELOPMENT OVERVIEW PLAN	16/07/2025	FOR RC	A
4	PROPOSED DEVELOPMENT EXISTING CONTOURS	16/07/2025	FOR RC	A
5	PROPOSED DEVELOPMENT FINISHED CONTOURS	16/07/2025	FOR RC	A
6	PROPOSED DEVELOPMENT EARTHWORKS	16/07/2025	FOR RC	A
7	PROPOSED DEVELOPMENT STORMWATER PLAN	16/07/2025	FOR RC	A
8	ROADWAY A - VIEW FRAME 1	16/07/2025	FOR RC	A
9	ROADWAY A - VIEW FRAME 2	16/07/2025	FOR RC	A
10	ROADWAY A - VIEW FRAME 3	16/07/2025	FOR RC	A
11	ROADWAY A1	16/07/2025	FOR RC	A
12	ROADWAY A2 - VIEW FRAME 1	16/07/2025	FOR RC	A
13	ROADWAY A2 - VIEW FRAME 2	16/07/2025	FOR RC	A
14	ROADWAY TYPICAL SECTIONS	16/07/2025	FOR RC	A
15	ROADWAY TYPICAL SECTIONS 2	16/07/2025	FOR RC	A
16	BOAT STORAGE YARD OVERVIEW AND STORMWATER PLAN	16/07/2025	FOR RC	A
17	BOAT STORAGE YARD EXISTING CONTOURS	16/07/2025	FOR RC	A
18	BOAT STORAGE YARD FINISHED CONTOURS	16/07/2025	FOR RC	A
19	BOAT STORAGE YARD EARTHWORKS	16/07/2025	FOR RC	A
20	BOAT STORAGE YARD TYPICAL SECTIONS	16/07/2025	FOR RC	A
21	PAVEMENT DETAILS	16/07/2025	FOR RC	A
22	OPEN DRAIN TYPICAL SECTIONS	16/07/2025	FOR RC	A

GENERAL NOTES:

1. THIS DRAWING SET HAS BEEN PRODUCED TO DEMONSTRATE INTERNAL ACCESS AND BOAT SHED FEASIBILITY TO SUPPORT A RESOURCE CONSENT. THESE DRAWINGS SHOULD NOT BE USED FOR CONSTRUCTION.
2. ALL ELEVATIONS AND CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM. COORDINATES ARE WITH REFERENCE TO NZTM 2000.
3. EXISTING TOPOGRAPHIC INFORMATION WITHIN THE LINE OF SURVEYED EXTENT HAS BEEN TAKEN FROM A TOPOGRAPHIC SURVEY BY WILLIAMS AND KING, REF 22043, DATED AUGUST 2017. ALL OTHER TOPOGRAPHIC DATA HAS BEEN TAKEN FROM NORTHLAND REGIONAL COUNCIL LIDAR (2018).
4. THIS DRAWING SET IS TO BE READ IN CONJUNCTION WITH THE VISION SITE SUITABILITY REPORT, REF J15724 AND THE LITTORALIS LANDSCAPE ARCHITECTURAL DRAWING SET, REF 1374, ISSUED AS PART OF THE RESOURCE CONSENT APPLICATION.

VISION JOB REFERENCE: J15724, VISION DRAWING STATUS: FOR RC, NUMBER OF SHEETS IN DRAWING SET 22, DRAWING SET APPROVED FOR RELEASE BY BCP ON 16/07/2025

Vision Consulting Engineers Ltd Level 1, 62 Kerikeri Road, Kerikeri 0230 +64 09 401 6287 WWW.VCE.CO.NZ

LEGEND

PROPOSED LOT BOUNDARY

NOTE:

1. ALL ELEVATIONS AND 0.5 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

0 15 30 45 60 75

Scale 1:1500 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: PROPOSED DEVELOPMENT AND BOAT STORAGE YARD OVERVIEW PLAN

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:1500
SHEET 02 OF 22
PROJECT J15724
REV A

NOTE:
1. ALL ELEVATIONS AND 0.5 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

FOR RC

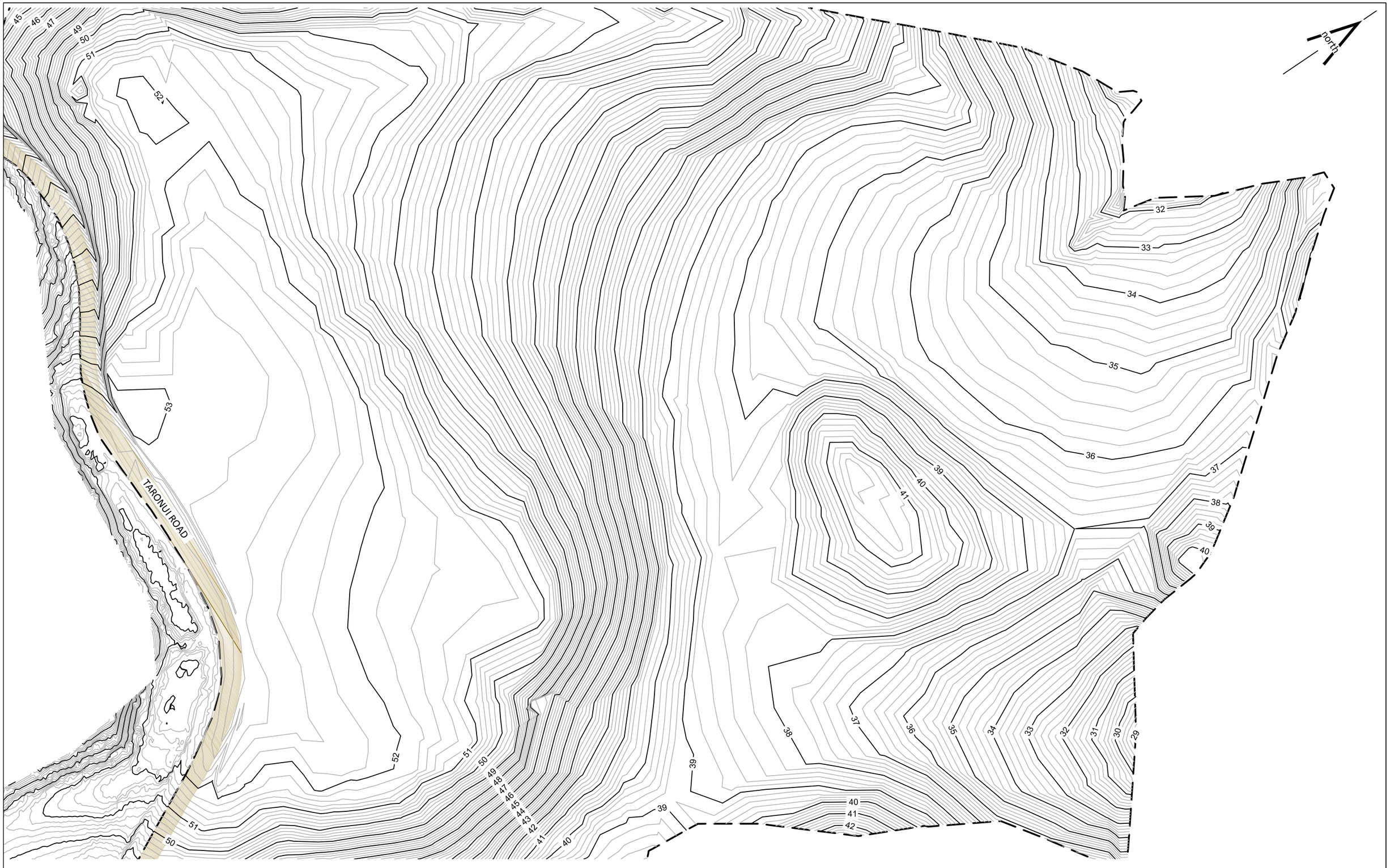
VISION CONSULTING ENGINEERS

CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	PROPOSED DEVELOPMENT OVERVIEW PLAN

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC.	BCP	16/07/2025

SCALE 1:1000
SHEET 03 OF 22
PROJECT J15724
REV A



NOTE:
1. ALL ELEVATIONS AND 0.2 m EXISTING CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: PROPOSED DEVELOPMENT EXISTING CONTOURS

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:1000
SHEET 04 OF 22
PROJECT J15724
REV A

NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

0 10 20 30 40 50
Scale 1:1000 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	PROPOSED DEVELOPMENT FINISHED CONTOURS

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:1000
SHEET 05 OF 22
PROJECT J15724
REV A

north

BANK EXCAVATED TO ACHIEVE SIGHT LINES

TARONUI ROAD

EXTENT OF TOPOGRAPHIC SURVEY

CUT/FILL Table			
Depth Range (m) (-Cut +Fill)	Area (m²)	Volume (m³)	Color
-2.5 to -2.0	4.1	0.3	
-2.0 to -1.5	27.9	6.4	
-1.5 to -1.0	359.2	60.8	
-1.0 to -0.5	2493.8	630.0	
-0.5 to 0.0	6841.1	2784.6	
0.0 to 0.5	4643.8	1955.0	
0.5 to 1.0	1757.7	503.1	
1.0 to 1.5	282.0	53.2	
1.5 to 2.0	31.0	5.0	
2.0 to 2.5	0.0	0.0	

NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. EARTHWORKS VOLUMES HAVE BEEN GENERATED FROM THE DIFFERENCE BETWEEN EXISTING GROUND SURFACE LEVELS AND PROPOSED FINISHED SURFACE LEVELS AND DO NOT ACCOUNT FOR THE VOLUME OF TOPSOIL, UNSUITABLE SOIL AND ROAD PAVEMENT MATERIALS.

0 10 20 30 40 50

Scale 1:1000 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

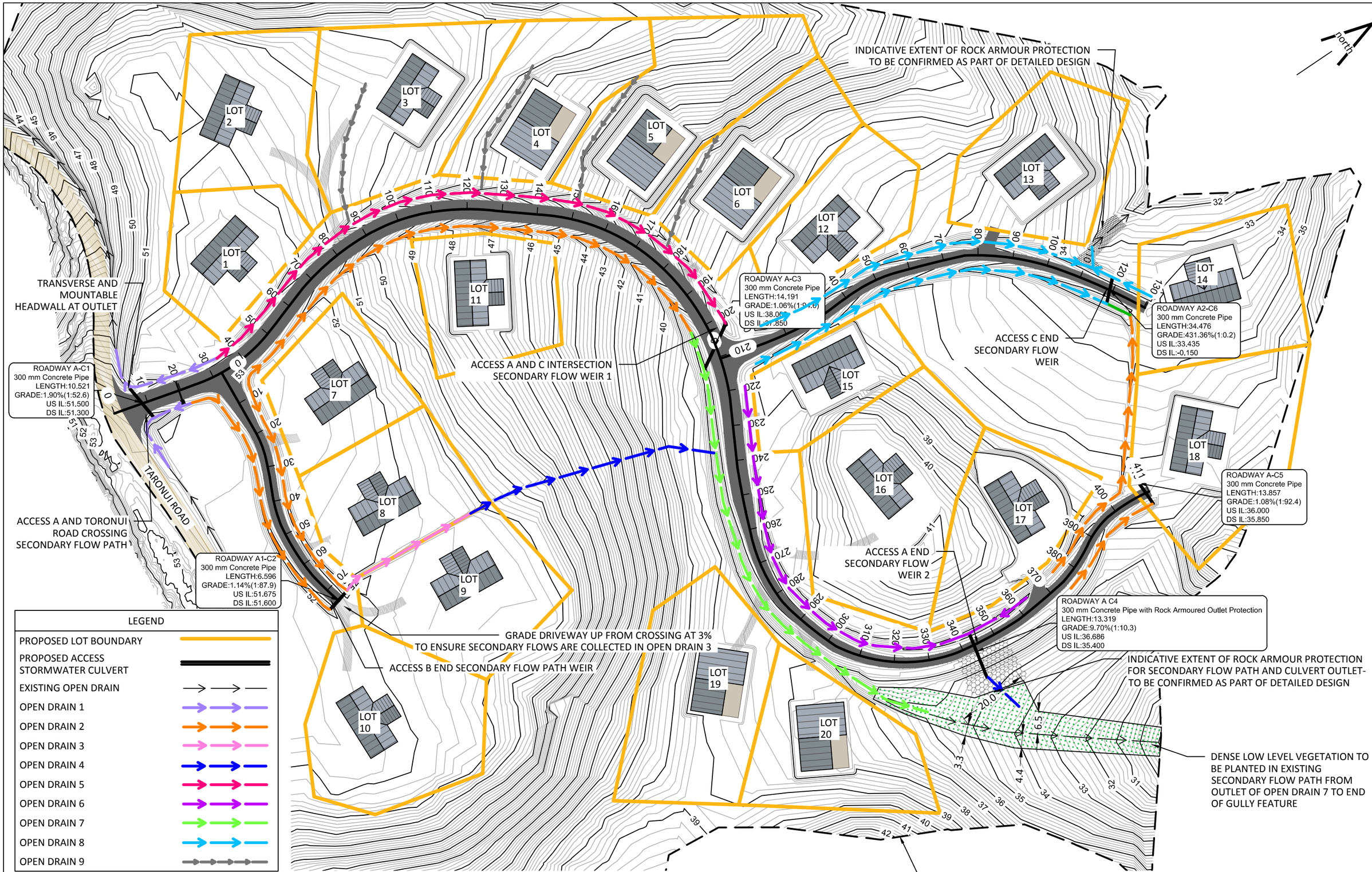
DRAWING TITLE: PROPOSED DEVELOPMENT
EARTHWORKS

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:1000
SHEET 06 OF 22
PROJECT J15724

REV A



LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED ACCESS
- STORMWATER CULVERT
- EXISTING OPEN DRAIN
- OPEN DRAIN 1
- OPEN DRAIN 2
- OPEN DRAIN 3
- OPEN DRAIN 4
- OPEN DRAIN 5
- OPEN DRAIN 6
- OPEN DRAIN 7
- OPEN DRAIN 8
- OPEN DRAIN 9

NOTES:

1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
3. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN.
4. SEE SHEET 22 FOR OPEN DRAIN DETAILS.

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

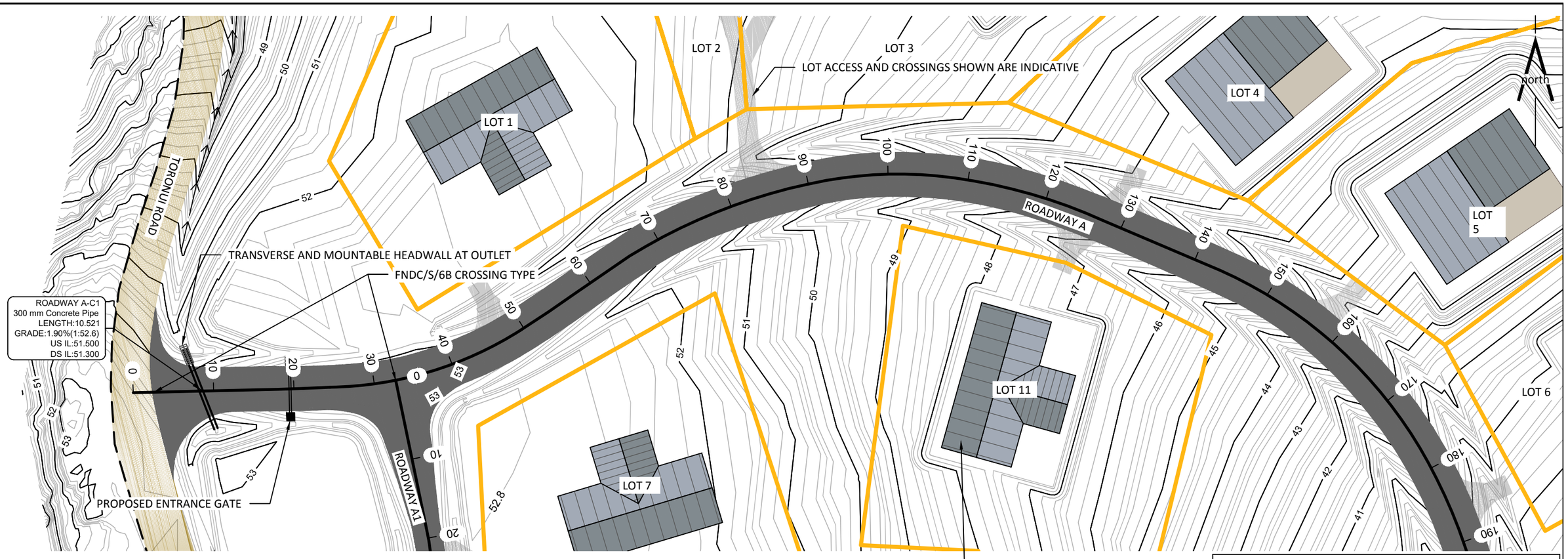
PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: PROPOSED DEVELOPMENT STORMWATER PLAN

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	08/07/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	03/06/2025

SCALE 1:1000
SHEET 07 OF 22
PROJECT J15724
REV A



DATUM 40.0m

DESIGN LEVELS	52.250	52.875	53.096	53.049	52.787	52.541	51.975	51.234	50.168	49.456	48.603	47.745	46.846	45.950	44.757	43.435	42.019
EXISTING LEVELS	53.044	53.000	52.957	52.916	52.735	52.489	51.904	51.208	50.129	49.424	48.602	47.678	46.790	45.916	44.717	43.387	41.963
DEPTH	-0.794	-0.125	0.140	0.134	0.052	0.053	0.071	0.026	0.039	0.032	0.001	0.067	0.056	0.034	0.041	0.047	0.056
CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	168.745

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. STORMWATER OPEN DRAINS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY. SEE SHEET 07 AND 22 FOR STORMWATER DETAILS.
3. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
4. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

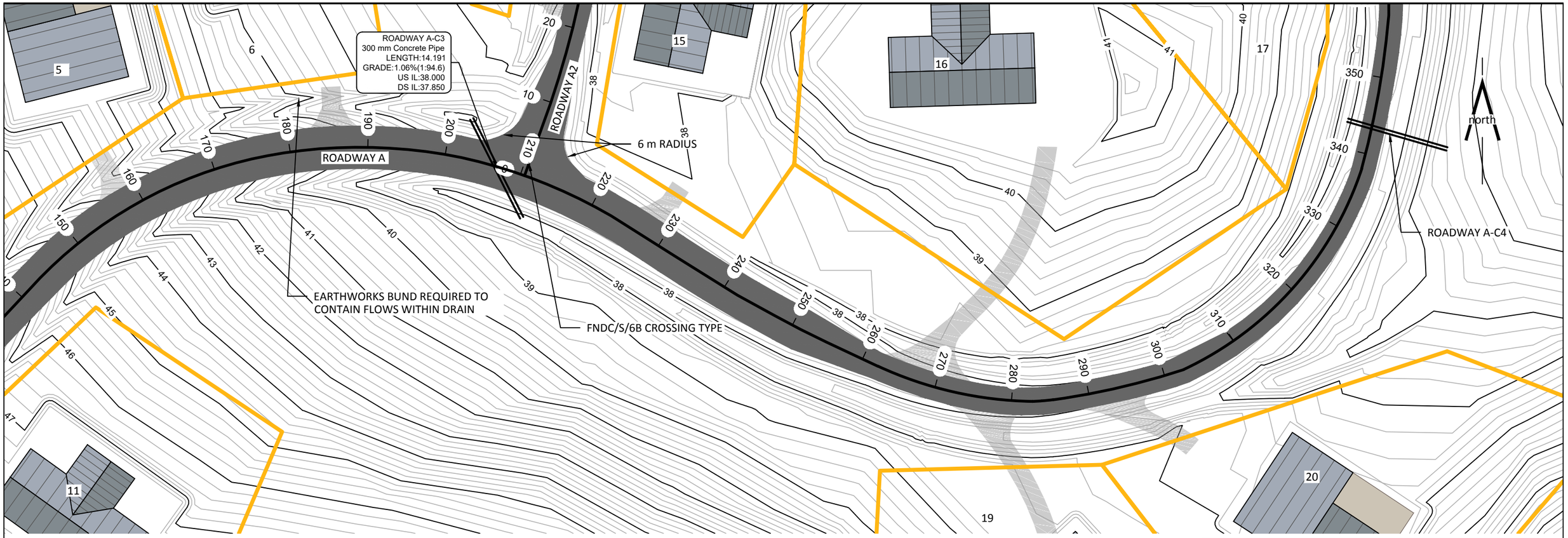
DRAWING TITLE: ROADWAY A - VIEW FRAME 1

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

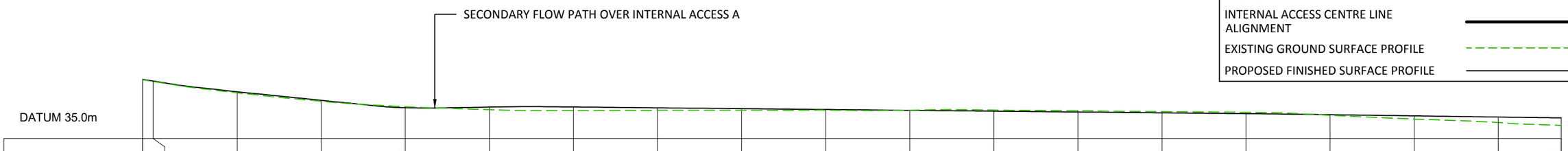
SCALE 1:500
SHEET 08 OF 22
PROJECT J15724

REV A



LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED ACCESS STORMWATER CULVERT
- INTERNAL ACCESS CENTRE LINE ALIGNMENT
- EXISTING GROUND SURFACE PROFILE
- PROPOSED FINISHED SURFACE PROFILE



DESIGN LEVELS	42.019	41.819	40.545	39.525	38.645	38.723	38.736	38.637	38.538	38.439	38.340	38.241	38.141	38.042	37.944	37.820	37.682	37.544	37.440
EXISTING LEVELS	41.963	41.763	40.428	39.418	38.773	38.417	38.319	38.349	38.355	38.368	38.370	38.371	38.308	38.180	38.107	37.744	37.306	36.894	36.560
DEPTH	0.056	0.056	0.117	0.107	-0.127	0.306	0.417	0.289	0.183	0.071	-0.030	-0.130	-0.167	-0.138	-0.163	0.076	0.376	0.649	0.880
CHAINAGE	168.745	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	337.490

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. STORMWATER OPEN DRAINS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY. SEE SHEET 07 AND 22 FOR STORMWATER DETAILS.
3. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
4. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

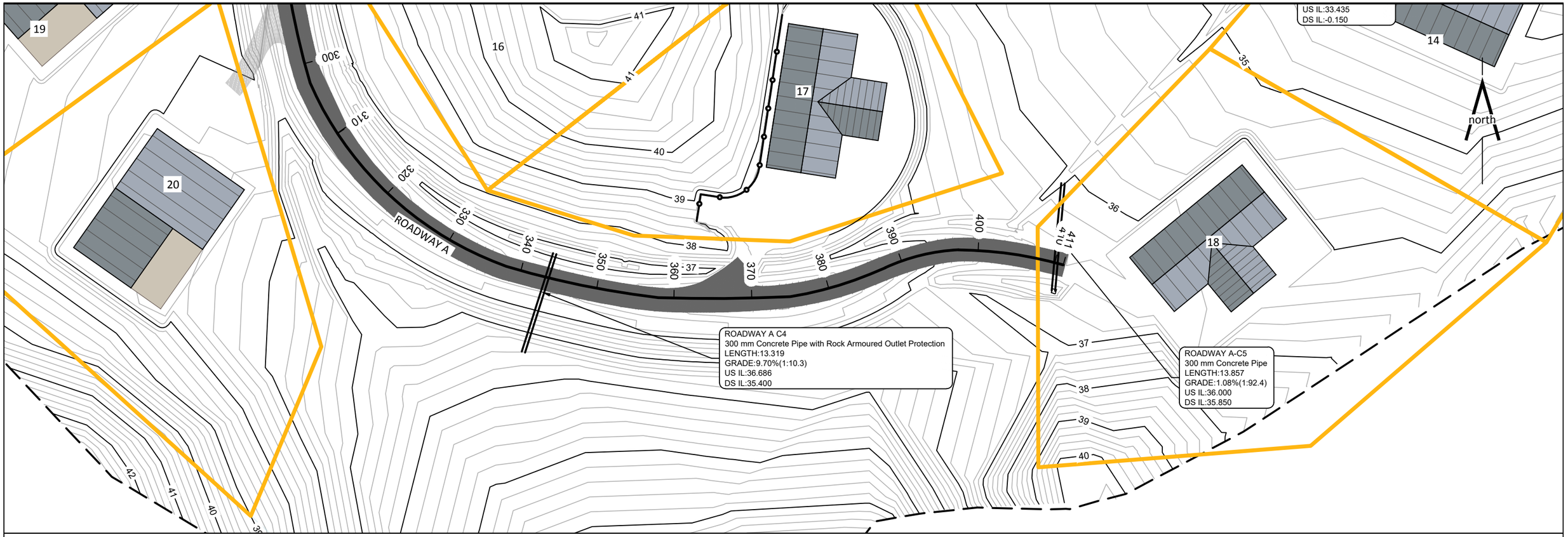
PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: ROADWAY A - VIEW FRAME 2

SURVEY			
DESIGN	CS	28/05/2025	
DRAWN	CS	28/05/2025	
CHECKED	BCP	16/07/2025	
APPROVED	BCP	16/07/2025	

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:500
SHEET 09 OF 22
PROJECT J15724
REV A



LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED ACCESS STORMWATER CULVERT
- INTERNAL ACCESS CENTRE LINE ALIGNMENT
- EXISTING GROUND SURFACE PROFILE
- PROPOSED FINISHED SURFACE PROFILE
- POSSIBLE 1 m HIGH RETAINING WALL

DATUM 35.0m

DESIGN LEVELS	37.440	37.403	37.363	37.522	37.718	37.684	37.250	36.848	36.563
EXISTING LEVELS	36.560	36.506	36.505	36.805	37.125	37.409	37.145	36.762	36.550
DEPTH	0.880	0.898	0.858	0.716	0.593	0.274	0.105	0.086	0.013
CHAINAGE	337.490	340.000	350.000	360.000	370.000	380.000	390.000	400.000	410.000

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. STORMWATER OPEN DRAINS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY. SEE SHEET 07 AND 22 FOR STORMWATER DETAILS.
3. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
4. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

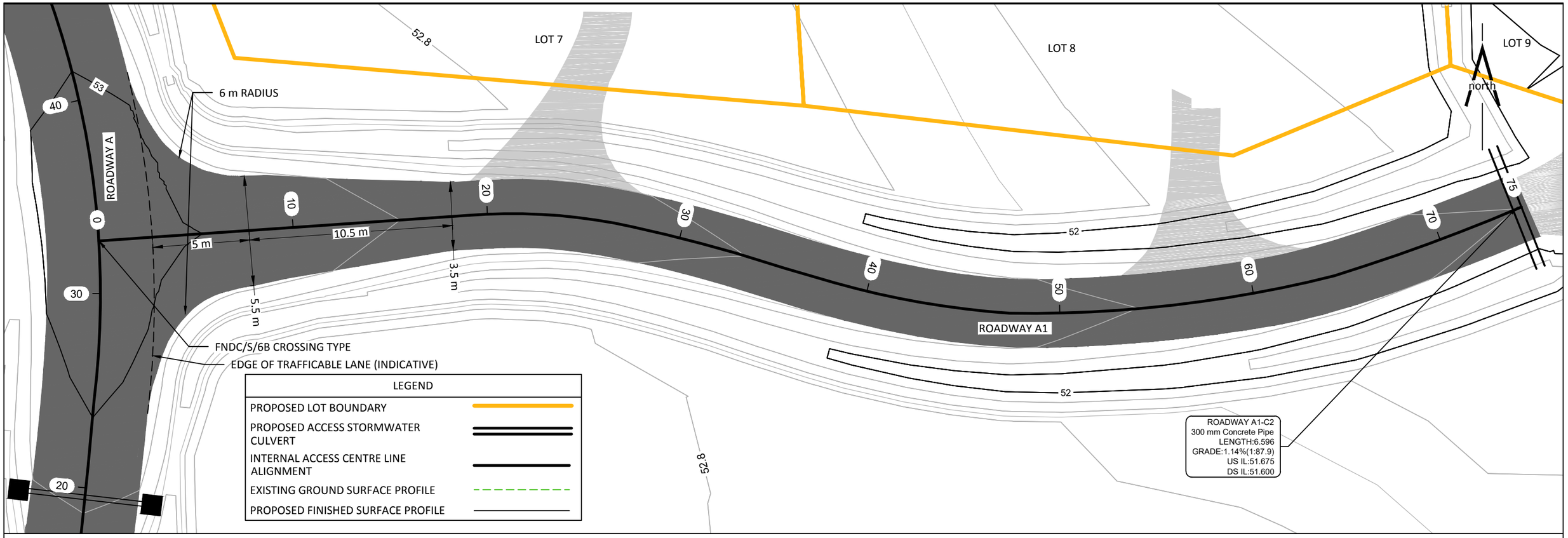
PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

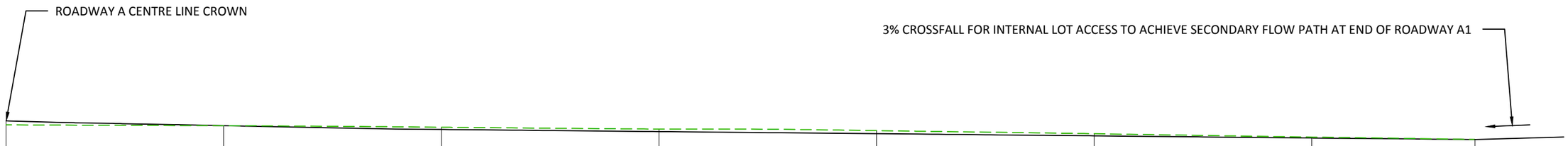
DRAWING TITLE: ROADWAY A - VIEW FRAME 3

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:500
SHEET 10 OF 22
PROJECT J15724
REV A





DATUM 50.0m

DESIGN LEVELS	52.908	52.732	52.634	52.537	52.440	52.340	
EXISTING LEVELS	52.905	52.835	52.754	52.680	52.536	52.382	
DEPTH	0.003	-0.103	-0.119	-0.142	-0.096	-0.043	
CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. STORMWATER OPEN DRAINS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY. SEE SHEET 07 AND 22 FOR STORMWATER DETAILS.
3. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
4. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN

0 2 4 6 8 10
Scale 1:200 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

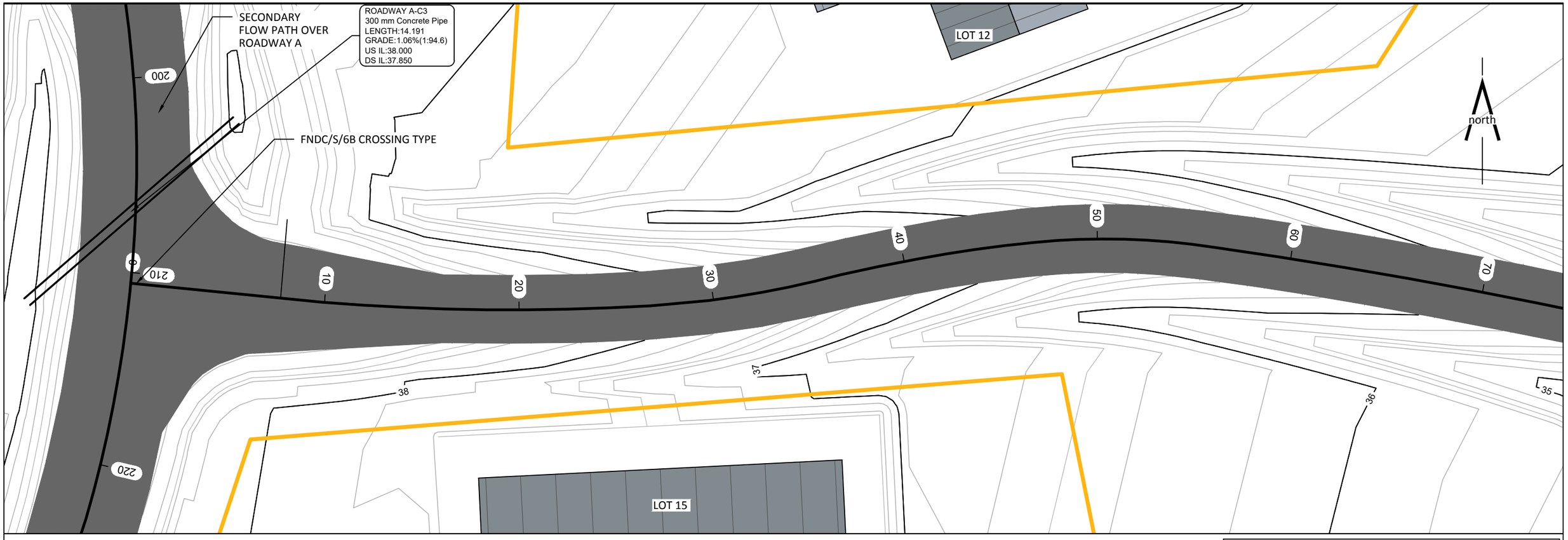
PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: ROADWAY A1

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:200
SHEET 11 OF 22
PROJECT J15724
REV A



LEGEND

- PROPOSED LOT BOUNDARY
- PROPOSED ACCESS STORMWATER CULVERT
- INTERNAL ACCESS CENTRE LINE ALIGNMENT
- EXISTING GROUND SURFACE PROFILE
- PROPOSED FINISHED SURFACE PROFILE

DATUM 35.0m

DESIGN LEVELS	38.892	38.421	37.840	37.259	36.705	36.320	
EXISTING LEVELS	38.015	37.638	37.223	36.928	36.640	36.290	
DEPTH	0.878	0.783	0.617	0.332	0.066	0.030	
CHAINAGE	10.000	20.000	30.000	40.000	50.000	60.000	

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. STORMWATER OPEN DRAINS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY. SEE SHEET 07 AND 22 FOR STORMWATER DETAILS.
3. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
4. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN

0 2 4 6 8 10
Scale 1:200 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: ROADWAY A2 - VIEW FRAME 1

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:200
SHEET 12 OF 22
PROJECT J15724
REV A

DATUM 30.0m

DESIGN LEVELS	36.030	35.916	35.459	35.003	34.628	34.317	34.175	34.274
EXISTING LEVELS	36.008	35.913	35.524	35.005	34.484	34.245	34.117	34.273
DEPTH	0.022	0.002	-0.065	-0.002	0.144	0.071	0.058	0.001
CHAINAGE	67.498	70.000	80.000	90.000	100.000	110.000	120.000	130.000

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. STORMWATER OPEN DRAINS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY. SEE SHEET 07 AND 22 FOR STORMWATER DETAILS.
3. ALL CULVERTS ARE TO HAVE ROCK AND MORTAR TYPE HEADWALLS UNLESS OTHERWISE SPECIFIED.
4. ALL LOT ACCESS AND CROSSINGS SHOWN ARE INDICATIVE ONLY. CULVERTS REQUIRED UNDER PROPOSED LOT CROSSINGS AND SECONDARY FLOW PATHS OVER CROSSINGS ARE TO BE SIZED DURING DETAILED DESIGN

0 2 4 6 8 10
Scale 1:200 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: ROADWAY A2 - VIEW FRAME 2

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

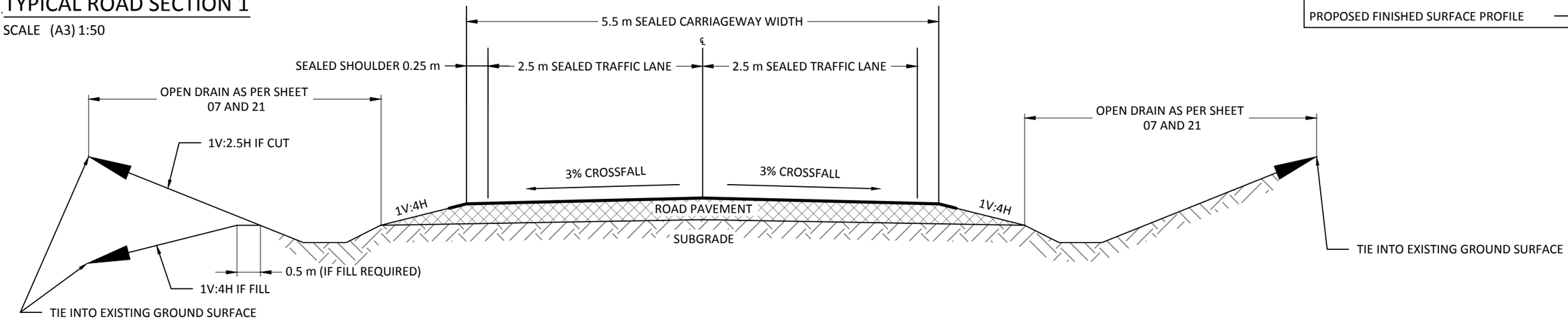
No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:200
SHEET 13 OF 22
PROJECT J15724
REV A

LEGEND	
EXTENT OF PAVEMENT SEAL	━━━
PROPOSED FINISHED SURFACE PROFILE	───

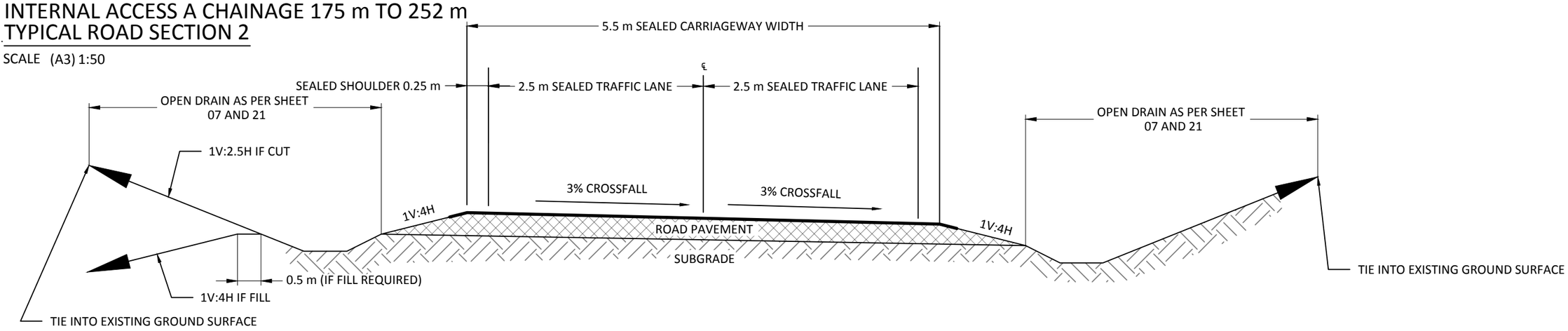
INTERNAL ACCESS A CHAINAGE 0 m TO 175 m
TYPICAL ROAD SECTION 1

SCALE (A3) 1:50



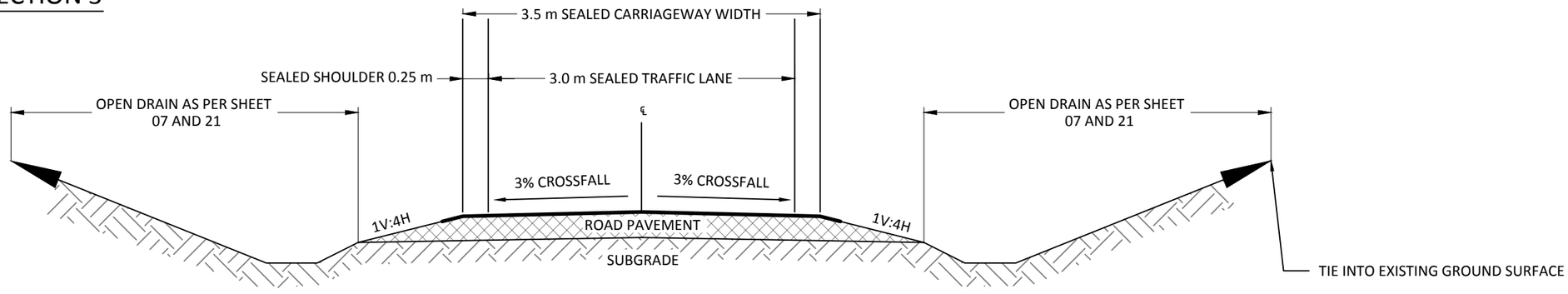
INTERNAL ACCESS A CHAINAGE 175 m TO 252 m
TYPICAL ROAD SECTION 2

SCALE (A3) 1:50



INTERNAL ACCESS A CHAINAGE 262 m TO 309 m - INTERNAL ACCESS B - INTERNAL ACCESS C CHAINAGE 0 m TO 75 m
TYPICAL ROAD SECTION 3

SCALE (A3) 1:50



NOTE:
1. PAVEMENT DETAILS ARE SHOWN ON SHEET 21
2. THE PAVEMENT IS TO BE SEALED OVER THE FULL CARRIAGEWAY WIDTH AND EXTEND 0.2 m DOWN THE 1V:4H SHOULDER SLOPE. THE SEAL TYPE AND DESIGN IS TO BE CONFIRMED AS PART OF DETAILED DESIGN.

0 0.5 1 1.5 2 2.5
Scale 1:50 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	ROADWAY TYPICAL SECTIONS

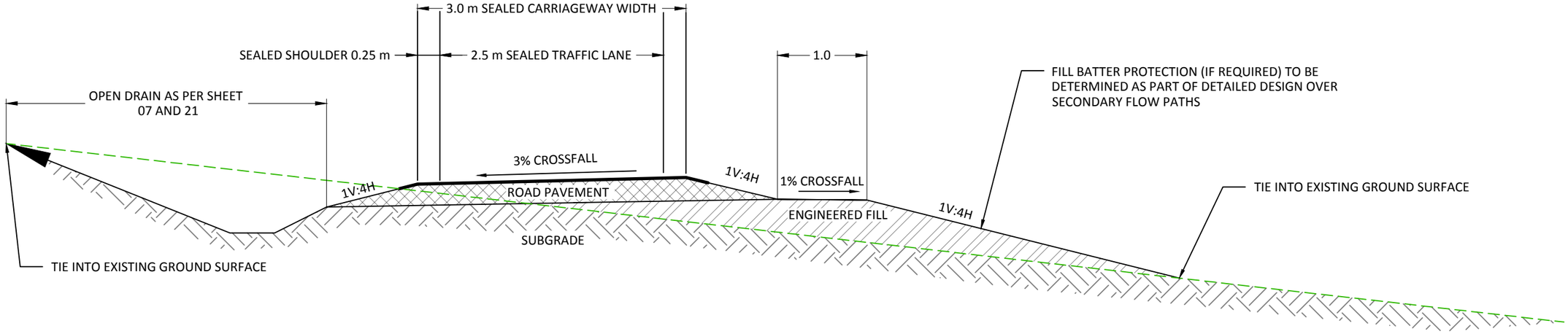
SURVEY			
DESIGN	CS	28/05/2025	
DRAWN	CS	08/07/2025	
CHECKED	BCP	16/07/2025	
APPROVED	BCP	16/07/2025	

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:50
SHEET 14 OF 22
PROJECT J15724
REV A

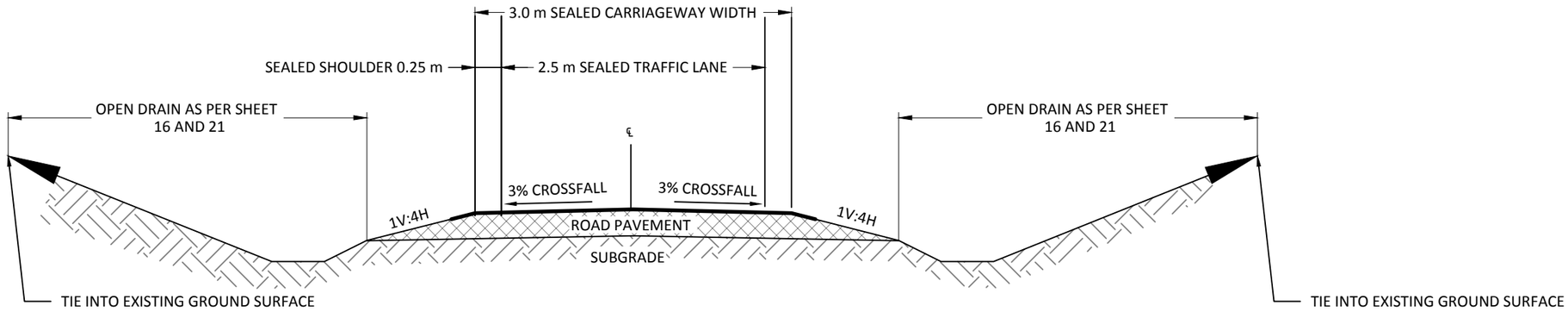
INTERNAL ACCESS A CHAINAGE 309 m TO 394 m
TYPICAL ROAD SECTION 4

SCALE (A3) 1:50



INTERNAL ACCESS A CHAINAGE 394 m TO 411 m (END) - INTERNAL ACCESS C CHAINAGE 75 m TO 130 m (END)
TYPICAL ROAD SECITON 5

SCALE (A3) 1:50



LEGEND	
EXTENT OF PAVEMENT SEAL	
EXISTING GROUND SURFACE PROFILE (INDICATIVE)	
PROPOSED FINISHED SURFACE PROFILE	

0 0.5 1 1.5 2 2.5

Scale 1:50 (m)

NOTE:
1. PAVEMENT DETAILS ARE SHOWN ON SHEET 21
2. THE PAVEMENT IS TO BE SEALED OVER THE FULL CARRIAGEWAY WIDTH AND EXTEND 0.2 m DOWN THE 1V:4H SHOULDER SLOPE. THE SEAL TYPE AND DESIGN IS TO BE CONFIRMED AS PART OF DETAILED DESIGN.

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

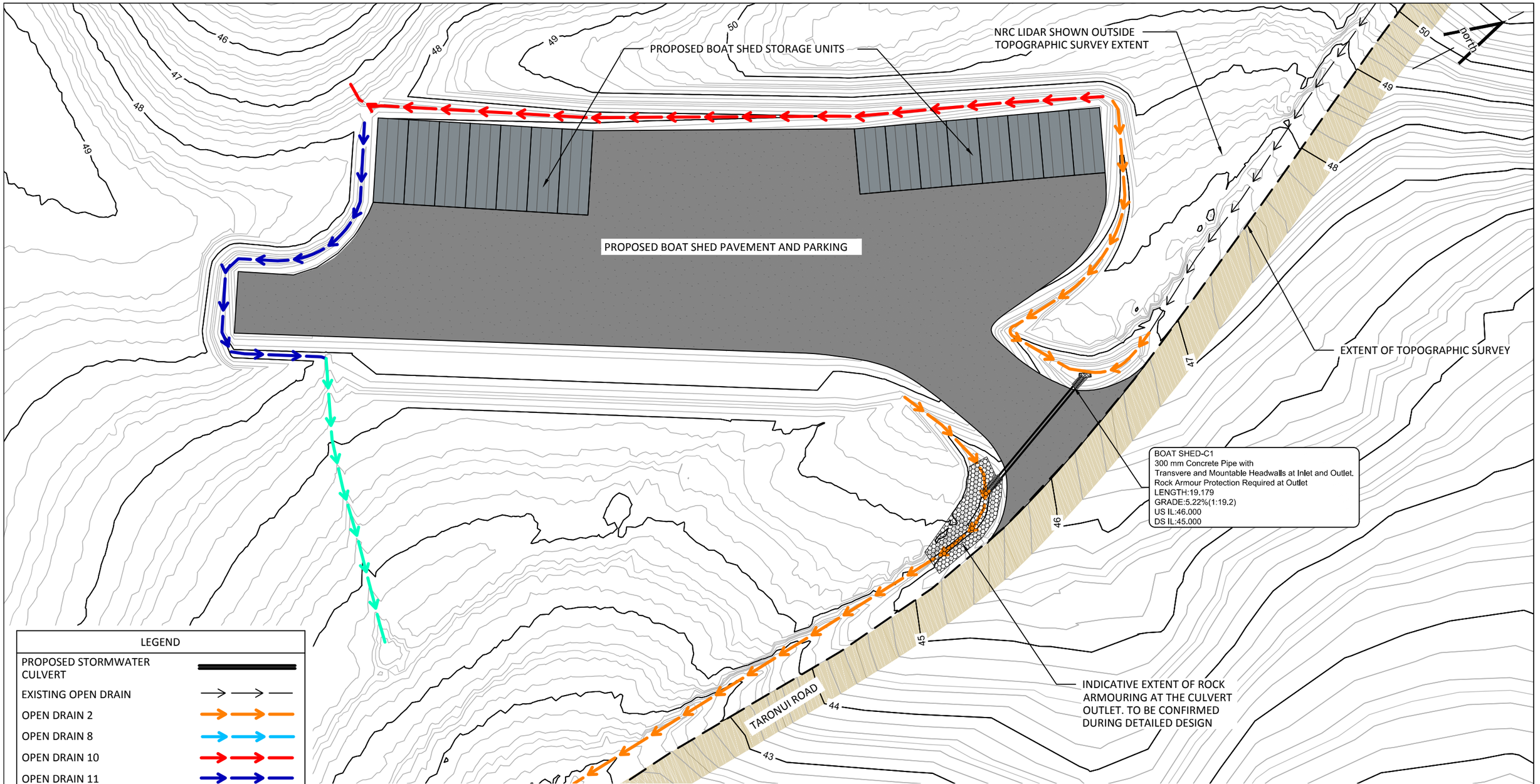
PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: ROADWAY TYPICAL SECTIONS 2

			No	REVISION	BY	DATE
SURVEY			A	FOR RC	BCP	16/07/2025
DESIGN	CS	28/05/2025				
DRAWN	CS	14/07/2025				
CHECKED	BCP	16/07/2025				
APPROVED	BCP	16/07/2025				

SCALE 1:50
SHEET 15 OF 22
PROJECT J15724

REV A



LEGEND	
PROPOSED STORMWATER CULVERT	
EXISTING OPEN DRAIN	
OPEN DRAIN 2	
OPEN DRAIN 8	
OPEN DRAIN 10	
OPEN DRAIN 11	
OPEN DRAIN 12	

NOTES:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. SEE SHEET 22 FOR OPEN DRAIN DETAILS

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

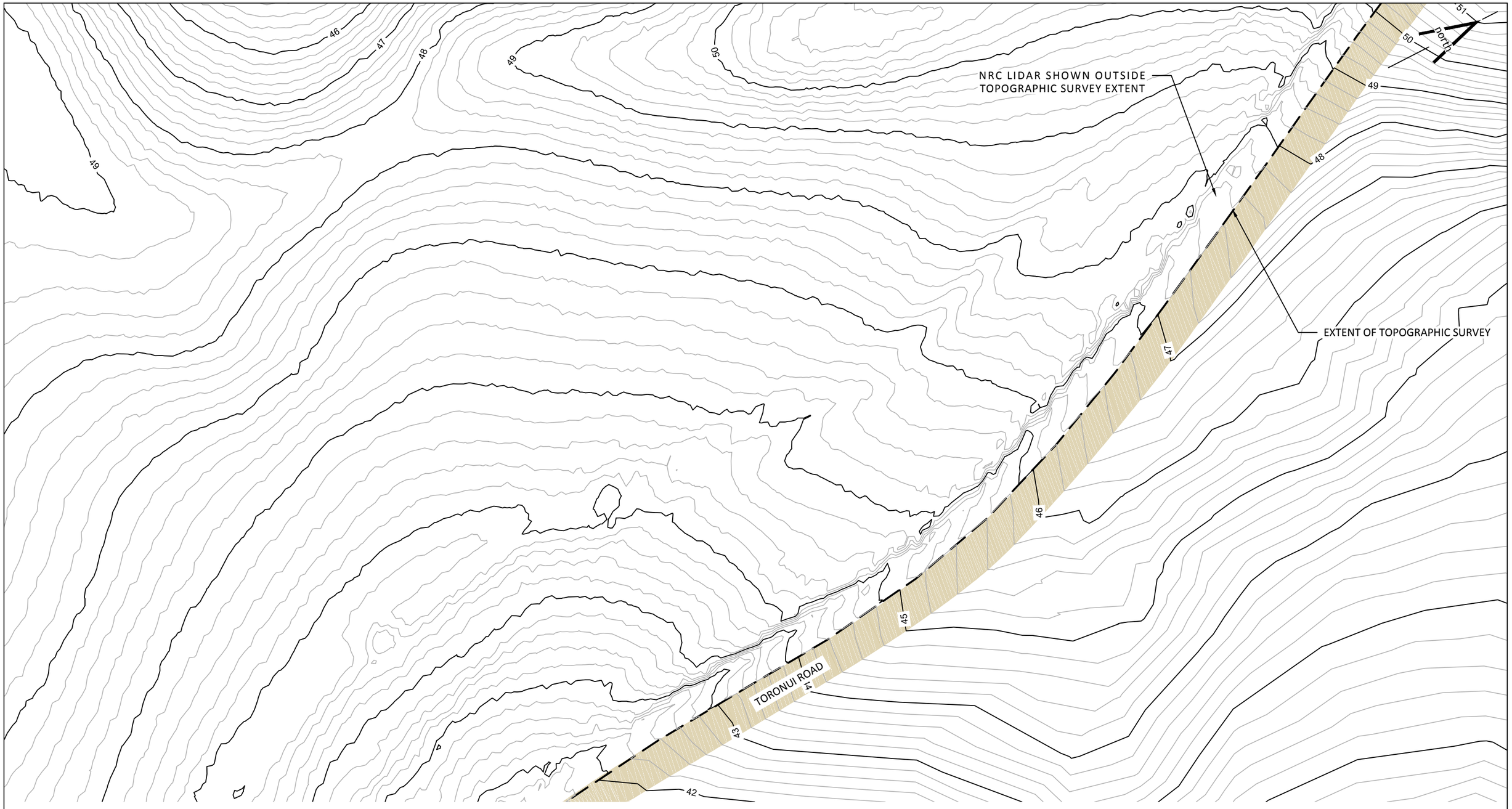
PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: BOAT STORAGE YARD OVERVIEW AND STORMWATER PLAN

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	08/07/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC.	BCP	16/07/2025

SCALE 1:500
SHEET 16 OF 22
PROJECT J15724
REV A



NOTE:
1. ALL ELEVATIONS AND 0.2 m EXISTING CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

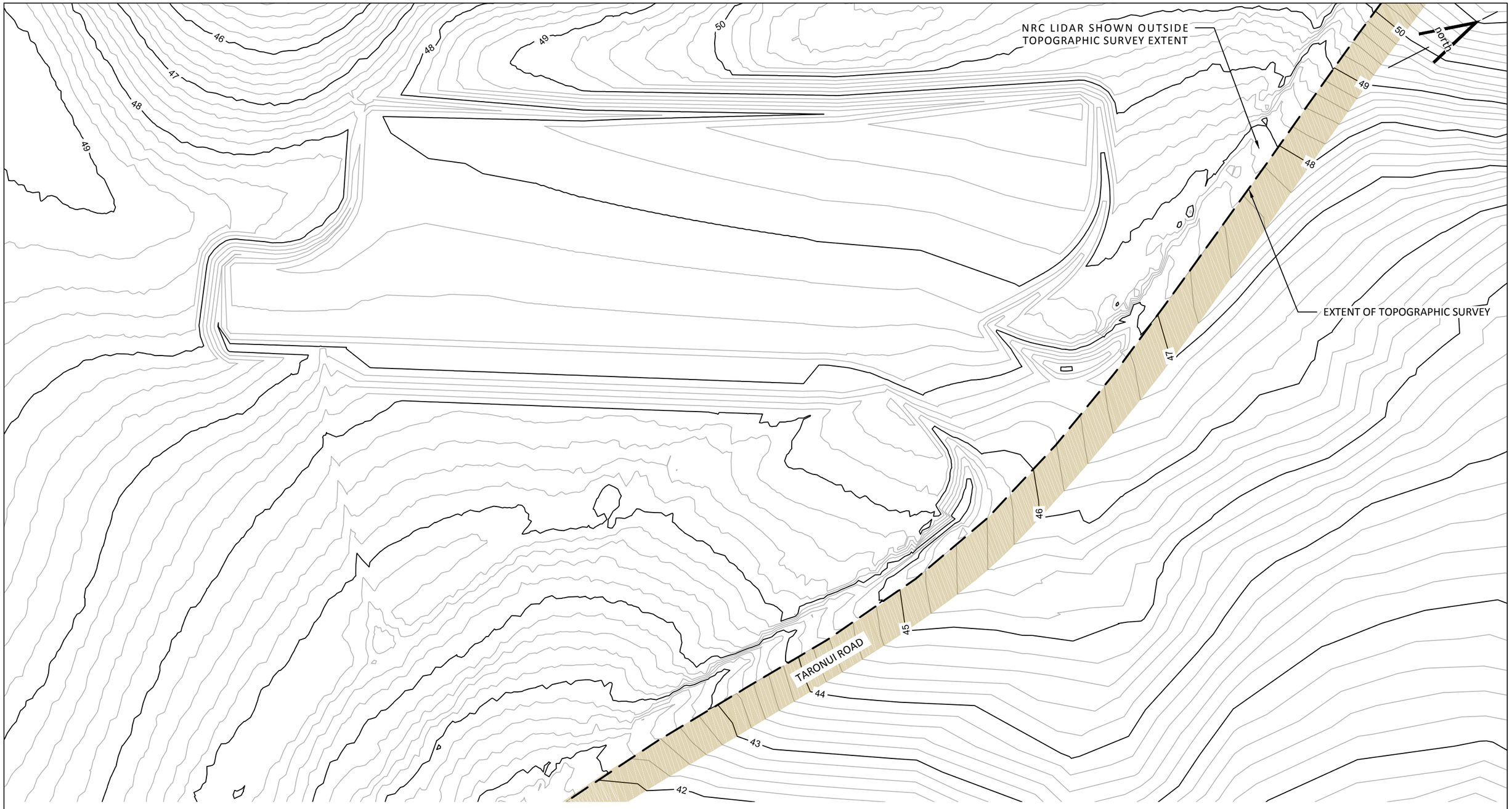
VISION CONSULTING ENGINEERS

CLIENT	TAPUAETAHI INCORPORATION	
PROJECT	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI	
DRAWING TITLE	BOAT STORAGE YARD EXISTING CONTOURS	

SURVEY			
DESIGN	CS	28/05/2025	
DRAWN	CS	08/07/2025	
CHECKED	BCP	16/07/2025	
APPROVED	BCP	16/07/2025	

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:500
SHEET 17 OF 22
PROJECT J15724
REV A



NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

VISION CONSULTING ENGINEERS

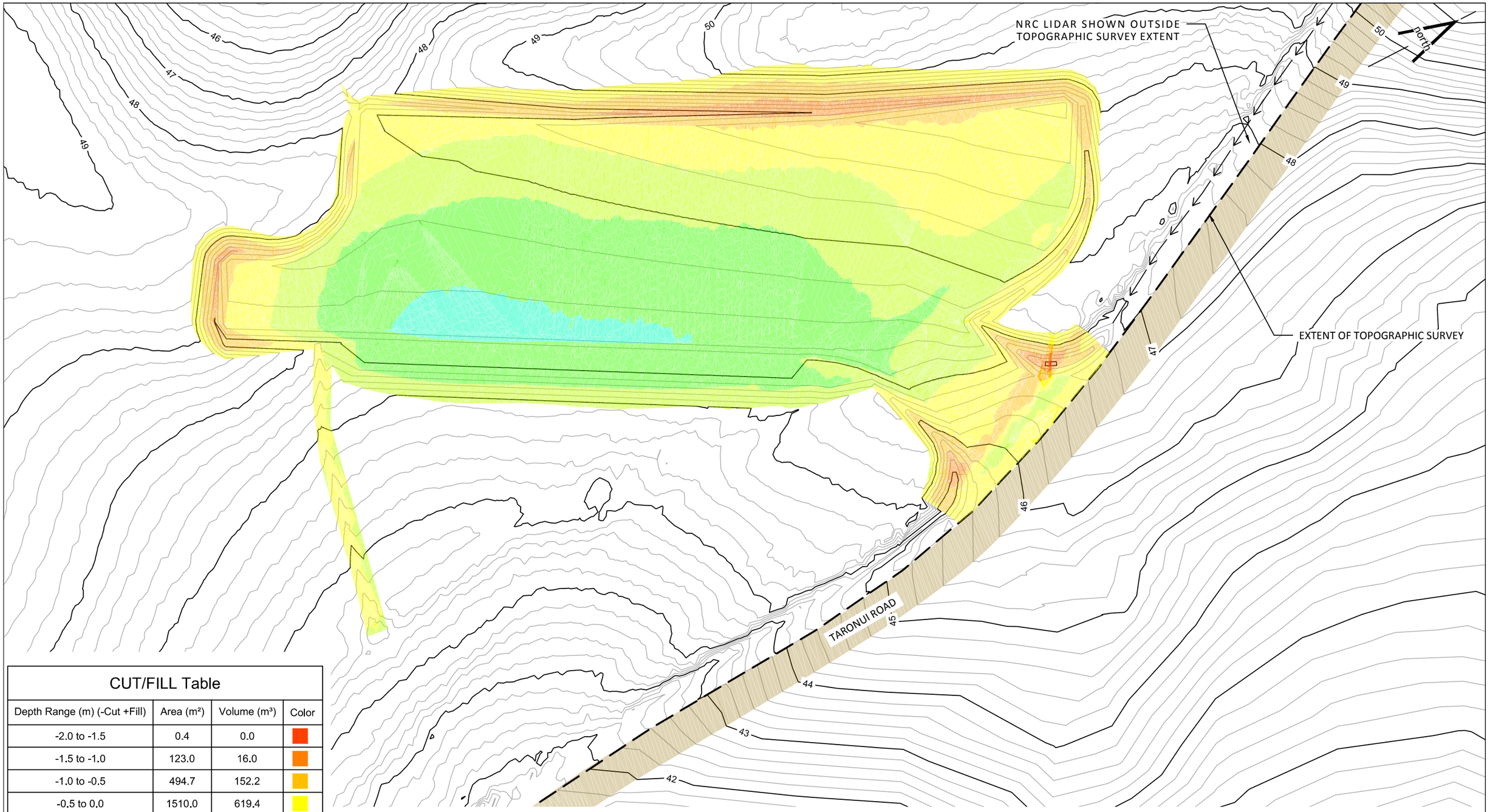
CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	BOAT STORAGE YARD FINISHED CONTOURS

SURVEY			
DESIGN	CS	28/05/2025	
DRAWN	CS	08/07/2025	
CHECKED	BCP	16/07/2025	
APPROVED	BCP	16/07/2025	

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:500
SHEET 18 OF 22
PROJECT J15724

REV A



CUT/FILL Table			
Depth Range (m) (-Cut +Fill)	Area (m²)	Volume (m³)	Color
-2.0 to -1.5	0.4	0.0	
-1.5 to -1.0	123.0	16.0	
-1.0 to -0.5	494.7	152.2	
-0.5 to 0.0	1510.0	619.4	
0.0 to 0.5	1356.5	1099.8	
0.5 to 1.0	1400.1	438.1	
1.0 to 1.5	176.2	11.4	

NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. EARTHWORKS VOLUMES HAVE BEEN GENERATED FROM THE DIFFERENCE BETWEEN EXISTING GROUND SURFACE LEVELS AND PROPOSED FINISHED SURFACE LEVELS AND DO NOT ACCOUNT FOR THE VOLUME OF TOPSOIL, UNSUITABLE SOIL AND ROAD PAVEMENT MATERIALS.

0 5 10 15 20 25
Scale 1:500 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: BOAT STORAGE YARD EARTHWORKS

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	08/07/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

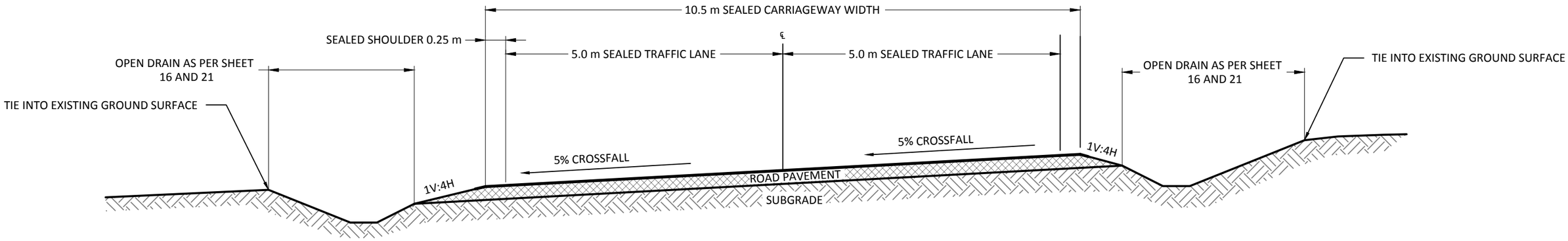
No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE 1:500
SHEET 19 OF 22
PROJECT J15724

REV A

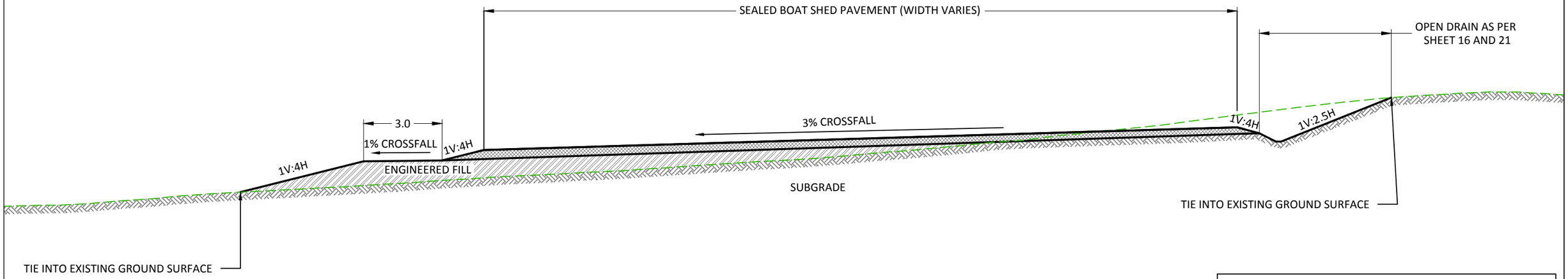
BOAT SHED ENTRANCE
BOAT SHED TYPICAL SECTION 1

SCALE (A3) 1:75



BOAT SHED PAVEMENT
BOAT SHED TYPICAL SECITON 2

SCALE (A3) 1:150



LEGEND	
EXTENT OF PAVEMENT SEAL	———
EXISTING GROUND SURFACE PROFILE	- - - - -
PROPOSED FINISHED SURFACE PROFILE	———

0 1.5 3 4.5 6 7.5

Scale 1:150 (m)

FOR RC

NOTE:
1. PAVEMENT THICKNESS SHOWN IS INDICATIVE AND WILL NEED TO BE CONFIRMED AS PART OF DETAILED DESIGN
2. THE PAVEMENT IS TO BE SEALED OVER THE FULL CARRIAGEWAY WIDTH AND EXTEND 0.2 m DOWN THE 1V:4H SHOULDER SLOPE. THE SEAL TYPE AND DESIGN IS TO BE CONFIRMED AS PART OF DETAILED DESIGN.

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: BOAT STORAGE YARD TYPICAL SECTIONS

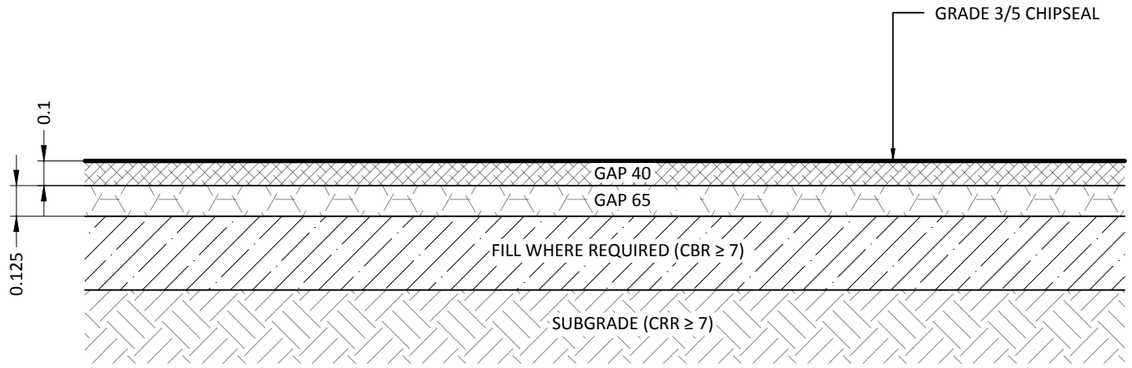
SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	14/07/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE: VARIES
SHEET: 20 OF 22
PROJECT: J15724
REV: A

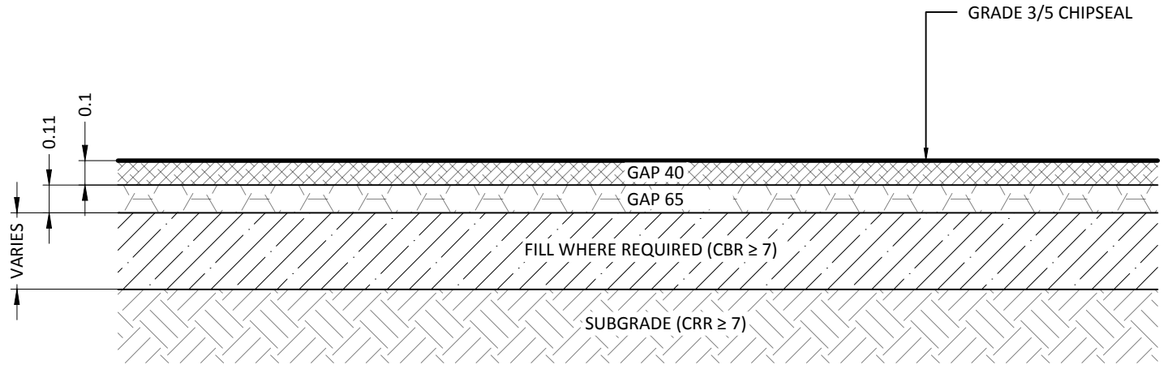
ROADWAY A, A1 AND A2
TYPICAL PAVEMENT DETAILS 1

SCALE (A3) 1:25



BOAT STORAGE YARD
TYPICAL PAVEMENT DETAILS 2

SCALE (A3) 1:25



0 0.25 0.50 0.75 1 1.25

Scale 1:25 (m)

FOR RC

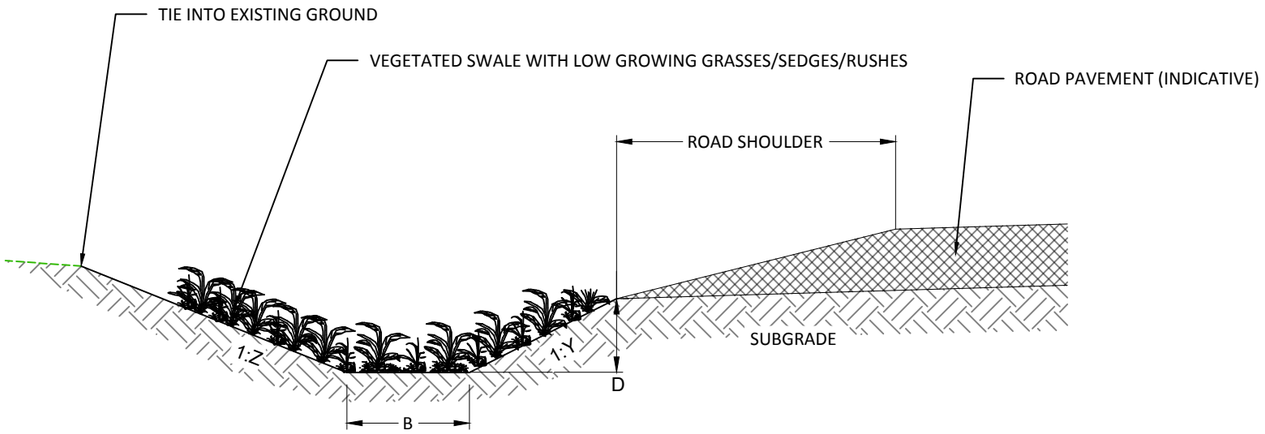
VISION CONSULTING ENGINEERS

CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	PAVEMENT DETAILS

SURVEY			
DESIGN	CS	28/05/2025	
DRAWN	CS	28/05/2025	
CHECKED	BCP	16/07/2025	
APPROVED	BCP	16/07/2025	

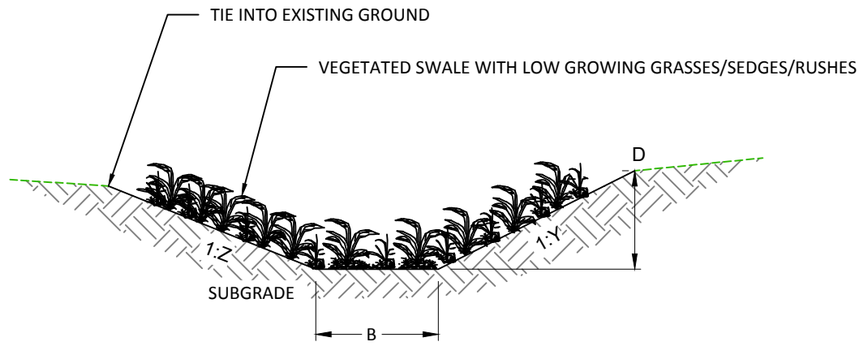
No	REVISION	BY	DATE
A	FOR RC	BCP	17/07/2025

SCALE 1:25
SHEET 21 OF 22
PROJECT J15724
REV A



OPEN DRAIN (ROAD) TYPICAL CROSS SECTION

SCALE (A3) NTS



OPEN DRAIN (OTHER) TYPICAL CROSS SECTION

SCALE (A3) NTS

OPEN DRAIN TABLE						
ID	B	D	Z	Y	OPEN DRAIN TYPE	PROTECTION
1	0.5m	0.1m	2.5	2	ROAD	LOW LEVEL VEGETATION
2	0.5m	0.2m	2.5	2	ROAD	LOW LEVEL VEGETATION
3	0.5m	0.3m	2.5	2	ROAD	LOW LEVEL VEGETATION
4	0.5m	0.2m	2.5	2.5	OTHER	LOW LEVEL VEGETATION
5	0.5m	0.25m	2.5	2	ROAD	LOW LEVEL VEGETATION
6	0.5m	0.3m	2.5	2	ROAD	LOW LEVEL VEGETATION
7	1.0m	0.65m	2.5	2	ROAD	LOW LEVEL VEGETATION
8	0.5m	0.35m	2.5	2	ROAD	LOW LEVEL VEGETATION
9	0.0m	0.3m	2.5	2.5	OTHER	LOW LEVEL VEGETATION
10	0.2m	0.3m	2.5	2	ROAD	LOW LEVEL VEGETATION
11	0.2m	0.2m	2.5	2	ROAD	LOW LEVEL VEGETATION
12	0.2m	0.2m	2.5	2.5	OTHER	LOW LEVEL VEGETATION

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT CIVIL DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: OPEN DRAIN TYPICAL SECTIONS

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	14/07/2025
CHECKED	BCP	16/07/2025
APPROVED	BCP	16/07/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	16/07/2025

SCALE NTS
SHEET 22 OF 22
PROJECT J15724
REV A

NOTE:
1. THE PURPOSE OF THE OVERVIEW PLAN IS TO SHOW THE LOCATION OF THE ATTENUATION POND IN RELATION TO THE DEVELOPMENT. CONTOURS HAVE BEEN LEFT OFF THIS SHEET FOR CLARITY.
2. THE SHEETS AS PART OF THIS DRAWING SET ARE CONCEPT LEVEL ONLY AND NOT TO BE USED FOR CONSTRUCTION.

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

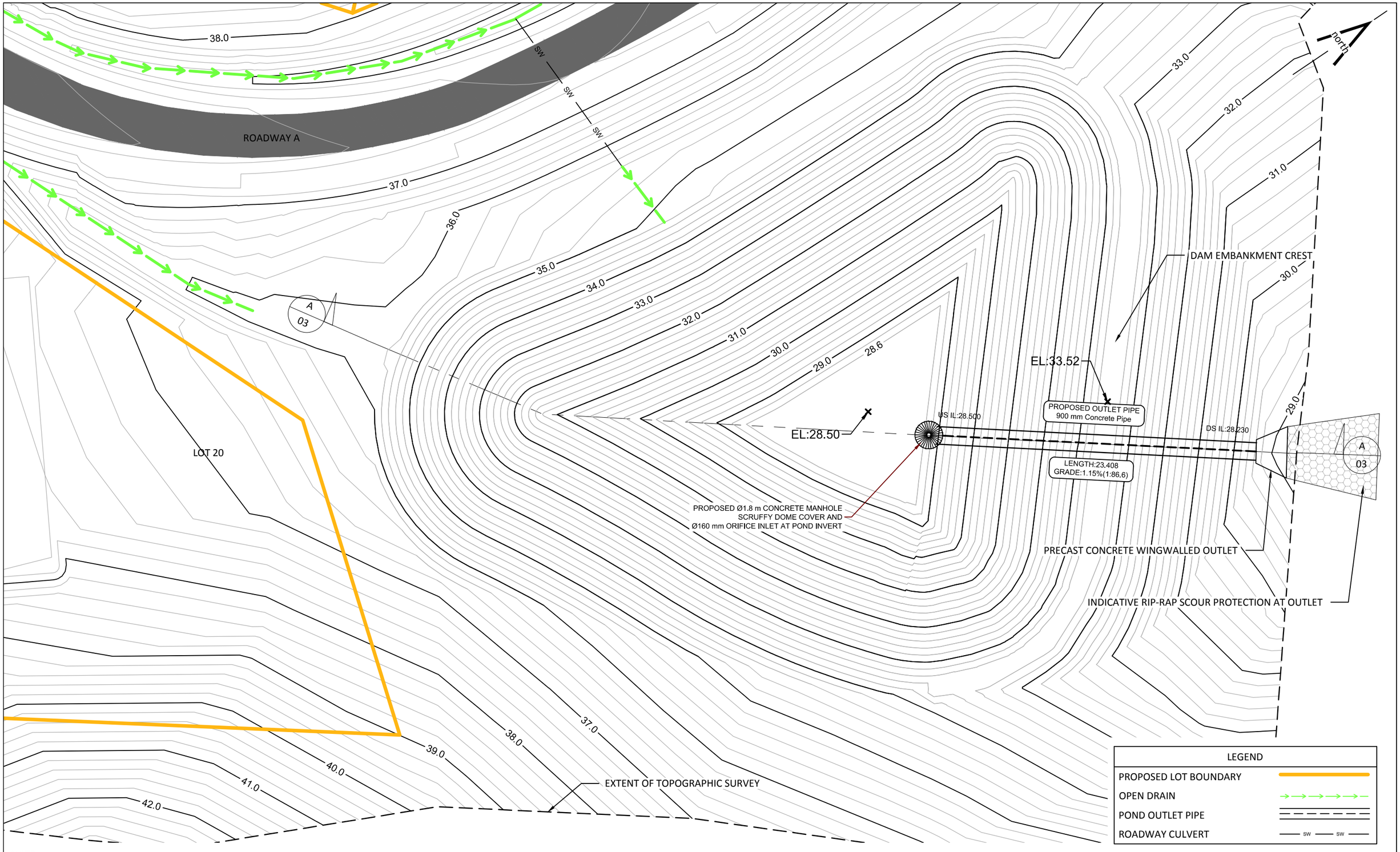
PROJECT: CONCEPT POND DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: DEVELOPMENT OVERVIEW PLAN

SURVEY		
DESIGN	CS	19/01/2026
DRAWN	CS	19/01/2026
CHECKED	JC	20/01/2026
APPROVED	JC	20/01/2026

No	REVISION	BY	DATE
A	FOR RC	JC	20/01/2026

SCALE 1:1000
SHEET 01 OF 06
PROJECT J15724
REV A



NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

0 2.5 5 7.5 10 12.5
Scale 1:250 (m)

FOR RC

VISION CONSULTING ENGINEERS

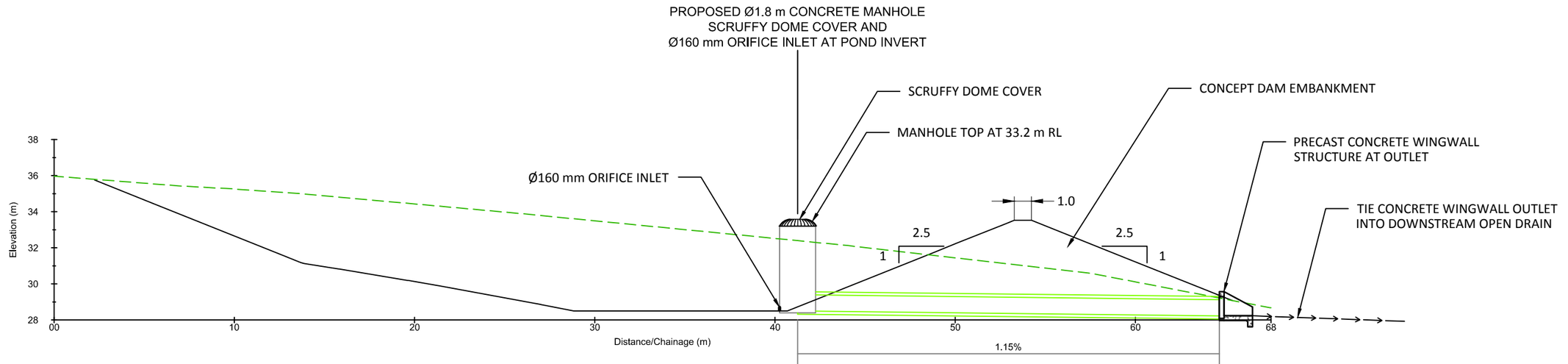
CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT POND DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	PROPOSED POND PLAN

SURVEY		
DESIGN	CS	19/01/2026
DRAWN	CS	19/01/2026
CHECKED	JC	20/01/2026
APPROVED	JC	20/01/2026

No	REVISION	BY	DATE
A	FOR RC	JC	20/01/2026

SCALE 3.999999
SHEET 02 OF 06
PROJECT J15724
REV A

LEGEND	
EXISTING GROUND SURFACE	
CONCEPT FINISHED GROUND SURFACE	
PROPOSED OUTLET PIPE	



GRADE %					1.15%		
PIPE DETAILS (CL to CL LENGTHS)					900 MM CONCRETE PIPE 3D LENGTH: 22.51		
DESIGN LEVEL AT MH CL		33.200					
INVERT LEVEL				28.500		28.230	
COVER				-0.852		0.061	
CHAINAGE		41.251					

NOTE:
1. ALL ELEVATIONS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

0 2.5 5 7.5 10 12.5
Scale 1:250 (m)

FOR RC

VISION CONSULTING ENGINEERS

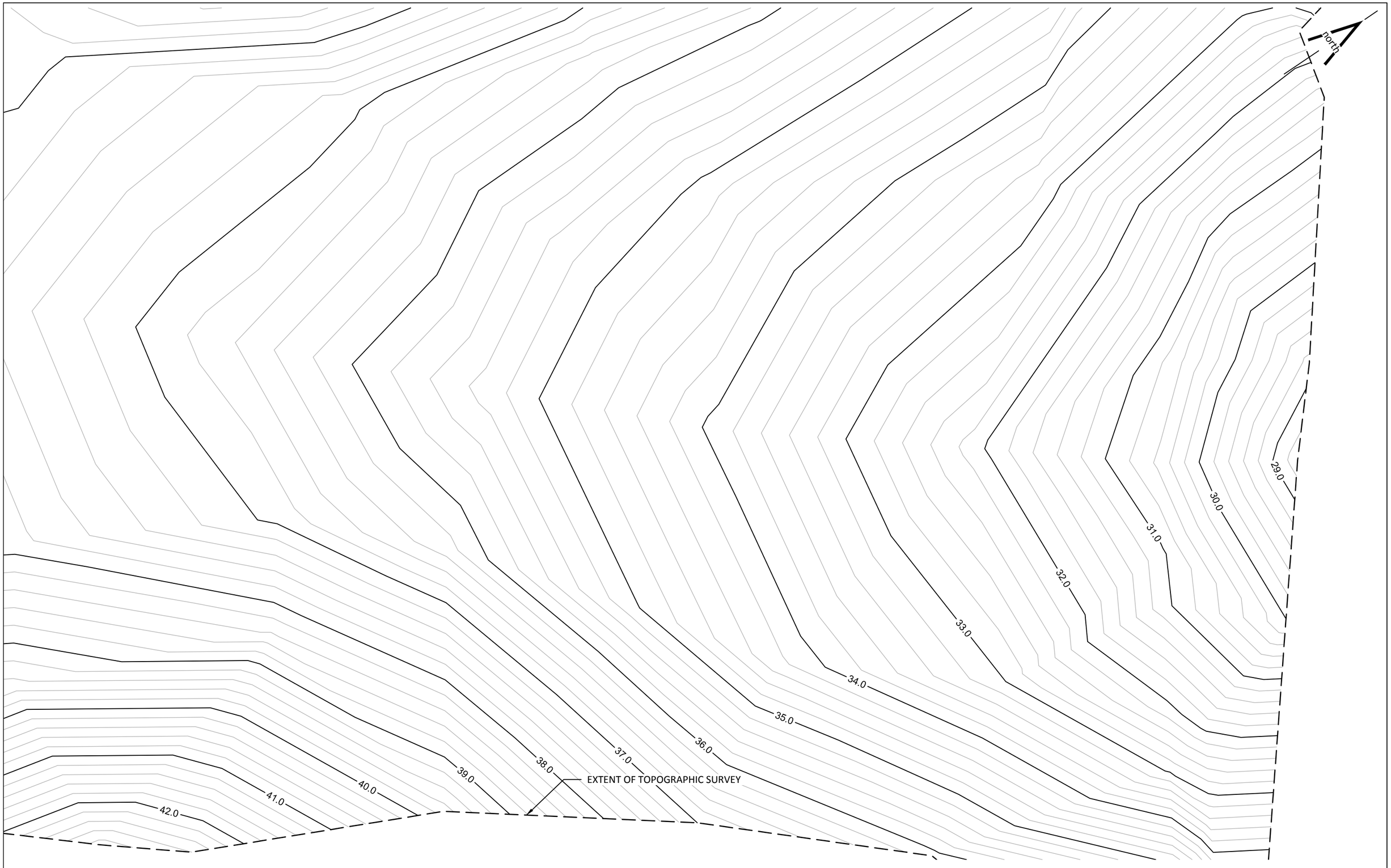
CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT POND DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	PROPOSED POND CROSS SECTION

SURVEY			
DESIGN	CS	19/01/2026	
DRAWN	CS	19/01/2026	
CHECKED	JC	20/01/2026	
APPROVED	JC	20/01/2026	

No	REVISION	BY	DATE
	FOR RC		20/01/2026

SCALE 1:250
SHEET 03 OF 06
PROJECT J15724

REV A



0 2.5 5 7.5 10 12.5

Scale 1:250 (m)

NOTE:
1. ALL ELEVATIONS AND 0.2 m EXISTING CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

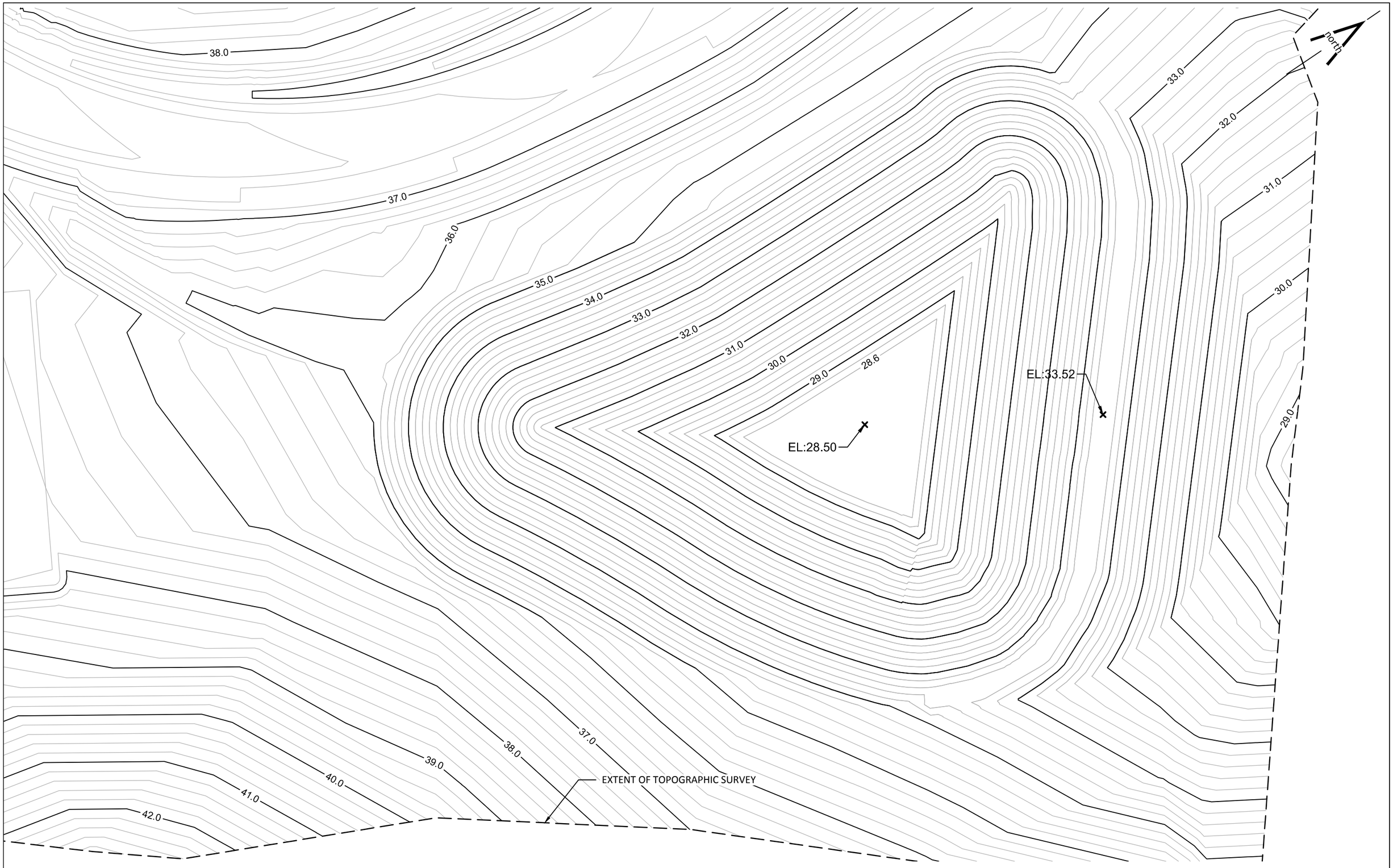
PROJECT: CONCEPT POND DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: EXISTING CONTOURS

SURVEY		
DESIGN	CS	19/01/2026
DRAWN	CS	19/01/2026
CHECKED	JC	20/01/2026
APPROVED	JC	20/01/2026

No	REVISION	BY	DATE
A	FOR RC	JC	16/07/2025

SCALE 1:250
SHEET 04 OF 06
PROJECT J15724
REV A



NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

FOR RC

VISION CONSULTING ENGINEERS

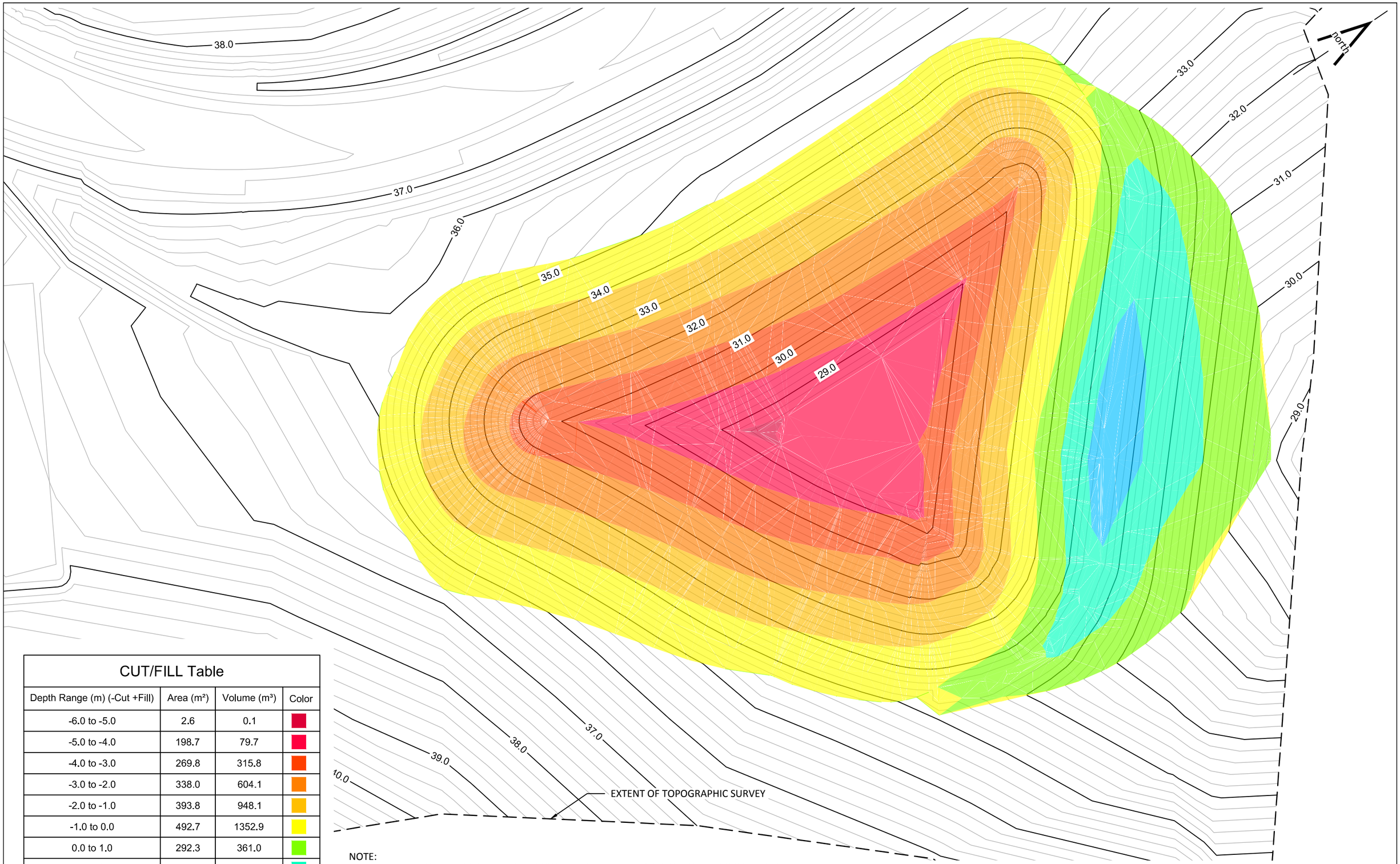
CLIENT	TAPUAETAHI INCORPORATION
PROJECT	CONCEPT POND DESIGN LOT 1 DP 184896 TAPUAETAHI
DRAWING TITLE	FINISHED CONTOURS

SURVEY			
DESIGN	CS	19/01/2025	
DRAWN	CS	19/01/2026	
CHECKED	JC	20/01/2026	
APPROVED	JC	20/01/2026	

FOR RC

No	REVISION	BY	DATE

SCALE 1:250
SHEET 05 OF 06
PROJECT J15724
REV A



CUT/FILL Table

Depth Range (m) (-Cut +Fill)	Area (m²)	Volume (m³)	Color
-6.0 to -5.0	2.6	0.1	
-5.0 to -4.0	198.7	79.7	
-4.0 to -3.0	269.8	315.8	
-3.0 to -2.0	338.0	604.1	
-2.0 to -1.0	393.8	948.1	
-1.0 to 0.0	492.7	1352.9	
0.0 to 1.0	292.3	361.0	
1.0 to 2.0	195.7	126.8	
2.0 to 3.0	46.9	10.7	

NOTE:
1. ALL ELEVATIONS AND 0.2 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.
2. EARTHWORKS VOLUMES HAVE BEEN GENERATED FROM THE DIFFERENCE BETWEEN EXISTING GROUND SURFACE LEVELS AND PROPOSED FINISHED POND SURFACE LEVELS AND DO NOT ACCOUNT FOR THE VOLUME OF TOPSOIL AND ANY POTENTIAL UNSUITABLE SOIL.
3. CONCEPT POND EARTHWORKS VOLUMES INDICATE 3300 m³ OF CUT AND 498 m³ OF FILL WITH A TOTAL OF 2802 m³ NET CUT TO BE POTENTIALLY UTILISED FOR BOAT STORAGE YARD FILL.

0 2.5 5 7.5 10 12.5
Scale 1:250 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: CONCEPT POND DESIGN
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: EARTHWORKS PLAN

SURVEY		
DESIGN	CS	19/01/2026
DRAWN	CS	19/01/2026
CHECKED	JC	20/01/2026
APPROVED	JC	20/01/2026

No	REVISION	BY	DATE
A	FOR RC	JC	20/01/2026

SCALE 1:250
SHEET 06 OF 06
PROJECT J15724
REV A

NOTE:

1. ALL ELEVATIONS AND 0.5 m FINISHED CONTOURS ARE WITH RESPECT TO NZVD 2016 VERTICAL DATUM.

VISION CONSULTING ENGINEERS

CLIENT	PROJECT
TAPUAETAHI INCORPORATION	CONCEPT CIVIL DESIGN LOT 1 DP 184896 TAPUAETAHI

Appendix E
ENGINEERING OUTCOMES " ASSESSMENT OF TRAFFIC EFFECTS"

Engineering Outcomes, Limited
132 Beach Road
PO Box 3048,
Onerahi
Whangarei
New Zealand
Telephone 09 436 5534
Mobile 027 472 0945
E-mail info@e-outcomes.co.nz

PROPOSED SUBDIVISION

TAPUAETAHI BEACH

TAI TOKERAU/NORTHLAND

ASSESSMENT OF TRAFFIC EFFECTS

Prepared by Engineering Outcomes Ltd
17 March 2026

Table of Contents

1. THE PROPOSAL

This is a traffic report in relation to proposed subdivision consisting of a total of twenty new residential lots, a boat storage and washing facility plus associated access and other services. It is proposed to be developed in six stages, but this report relates to the entire development.

The proposal is located on Lot 1 DP 184896 on Taronui Road, Tapuaetahi Beach, Tai Tokerau/Northland. It is described in the plans reproduced in Appendix A, one of which is the staging plan.

All dwellings are proposed to lead to a single new access connection on the northern side of Taronui Road 1.76 kilometres from Pururua Road. No direct access or driveway connection points are proposed onto Taronui Road nor any existing public roads – all dwellings lead to the new internal shared roadways.

2. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Overall, subject to the recommended work - a sight bench west of the new access connection to Taronui Road (at Stage 1) and the realignment of the Taronui Road/Pururua Road intersection (at Stage 4), it is concluded that the traffic effects and safety risks associated with the proposal will be well within acceptable limits and less than minor. More details of the proposed mitigation, and the proposed widths of internal access, are given in Figures 2 to 6 for which Figure 1 is a general location plan.

With the sight benching, the sight distances in relation to all access connection significantly exceeds the "safe stopping" standard along all vectors and are more than adequate. Widening of Taronui Road is not warranted through its Pururua Road connection point, especially with the expected low rate of traffic generation.

Some walking trips are expected, but to be only a very small proportion of the overall trip profile and safe because of the low speeds in the vicinity. The effects on the wider road network are expected to be negligible and no associated mitigation is warranted.

It is also recommended that a corridor investigation be carried out, by the council, into the safety of Pururua Road.

3. THE EXISTING ROAD NETWORK

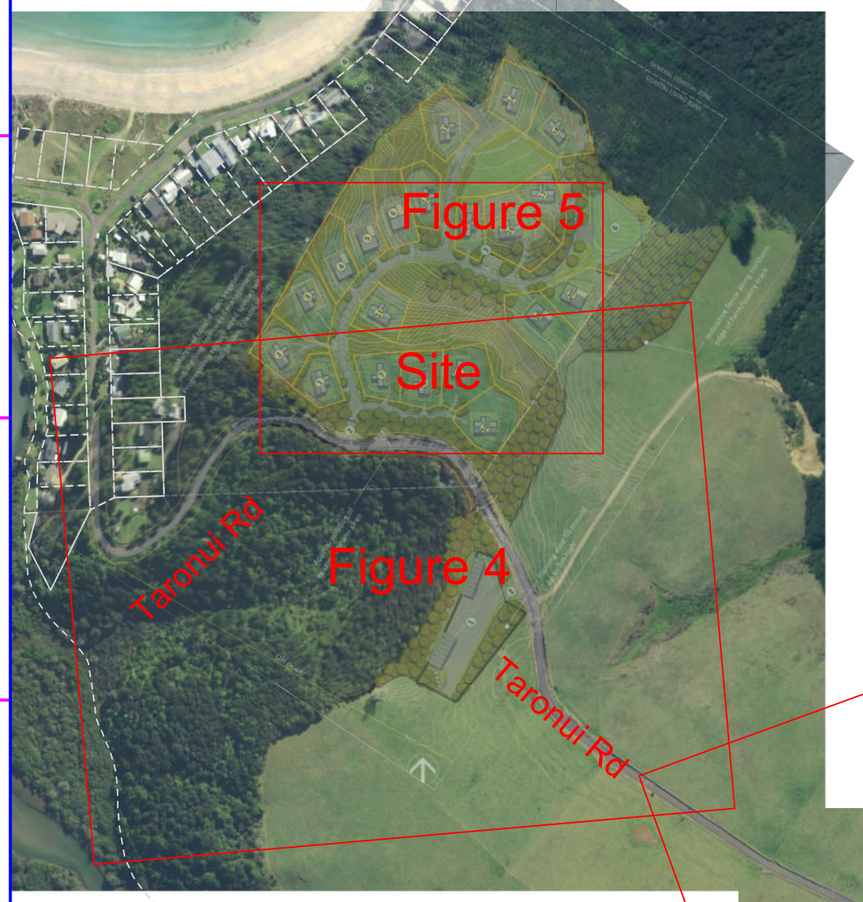
Taronui Road is a private roadway that connects Tapuaetahi Beach to Pururua Road. It is sealed with a carriageway width between 4.8 and 5.5 metres and open side drains. Access to Taronui Road is controlled by a PIN-actuated electric gate that is 16 metres from the edge of Pururua Road, the PIN for which is known only to residents and changed monthly.

Taronui Road connects to the northern side of Pururua Road at RAMM 10.05 kilometres. Pururua Road is a public road that leads to the Pururua peninsular including large tracts of pastoral and rural-residential land and the Marsden Cross historical site.

In the vicinity of Taronui Road, Pururua Road is unsealed and 6.2 to 6.4 metres wide. The first 9.5 kilometres of Pururua Road is sealed, so only 0.5 kilometres is unsealed ahead of Taronui Road. There is no carriageway lighting in this vicinity.

There are two single-lane bridges on Pururua Road between Taronui Road and Kapiro Road and another on Landing Road, which is on the shortest route between the site and the Kerikeri CBD.

Figure 1



N

0 100 200 300 400 500

metres

Plan
Overall
Taronui Rd
Site

engineering outcomes
PO Box 3048,
Onerahi
Whangarei 0142
Tel. 09 436 5534
info@e-outcomes.co.nz

Project
Subdivision
Taronui Road
Te Tii

Client
Tapuaetahi Incorporation

Surveyed by
LINZ
NRC

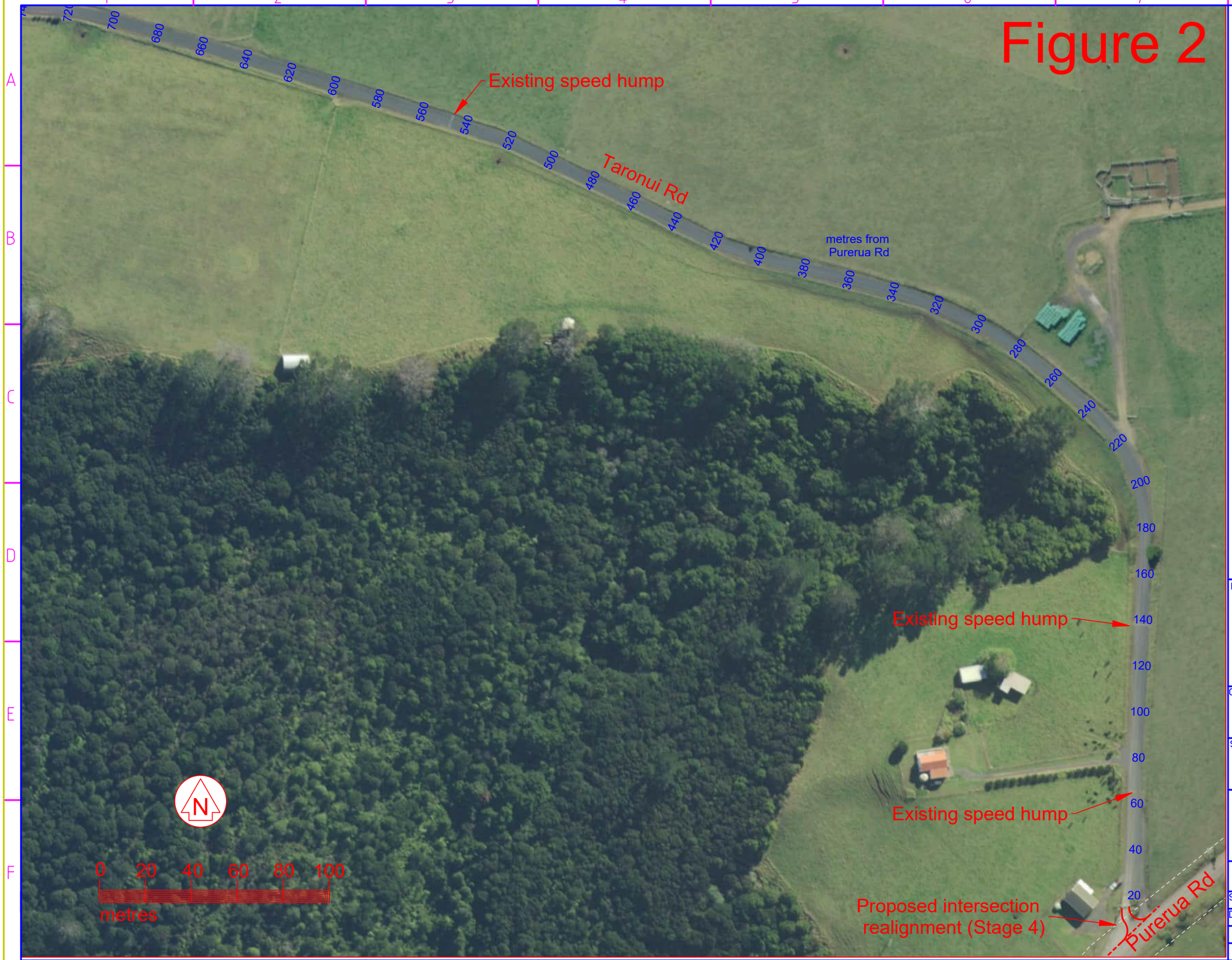
Amendments

Council ref.

Scale 1: 5000 at A4

Date 17-Mar-2026 15:03:43

Figure 2



Plan
Taronui Rd
0 to 700m

engineering outcomes

PO Box 3048,
Onerahi
Whangarei 0142
Tel. 09 436 5534
info@e-outcomes.co.nz

Project
Subdivision
Taronui Road
Te Tii

Client
Tapuaetahi
Incorporation

Surveyed by
LINZ
NRC

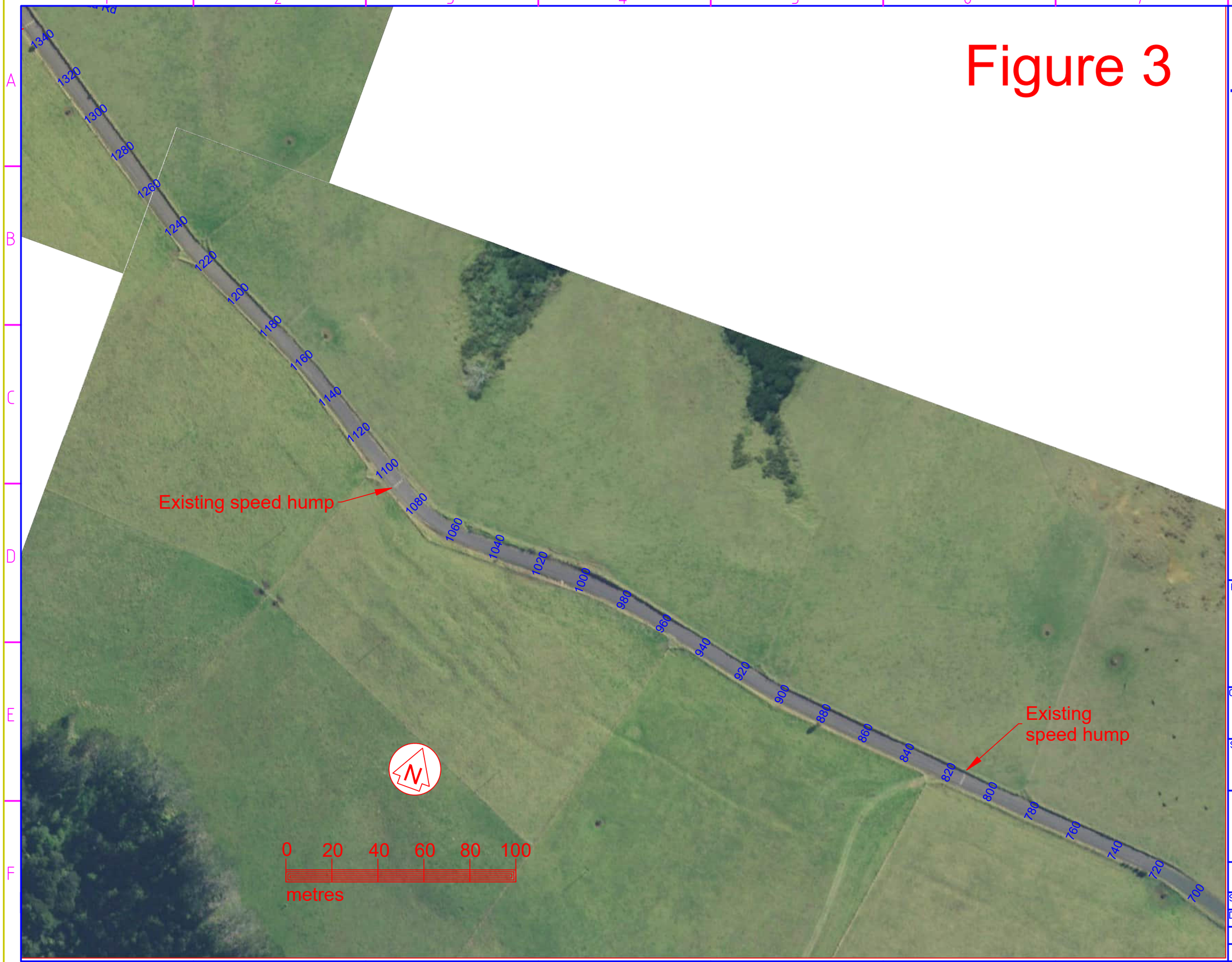
Amendments

Council ref.

Scale 1: 1500 at A4

Date 17-Mar-2026 15:03:44

Figure 3



Plan
Taronui Rd
700 to 1340m

engineering outcomes
PO Box 3048,
Onerahi
Whangarei 0142
Tel. 09 436 5534
info@e-outcomes.co.nz

Project
Subdivision
Taronui Road
Te Tii

Client
Tapuaetahi Incorporation

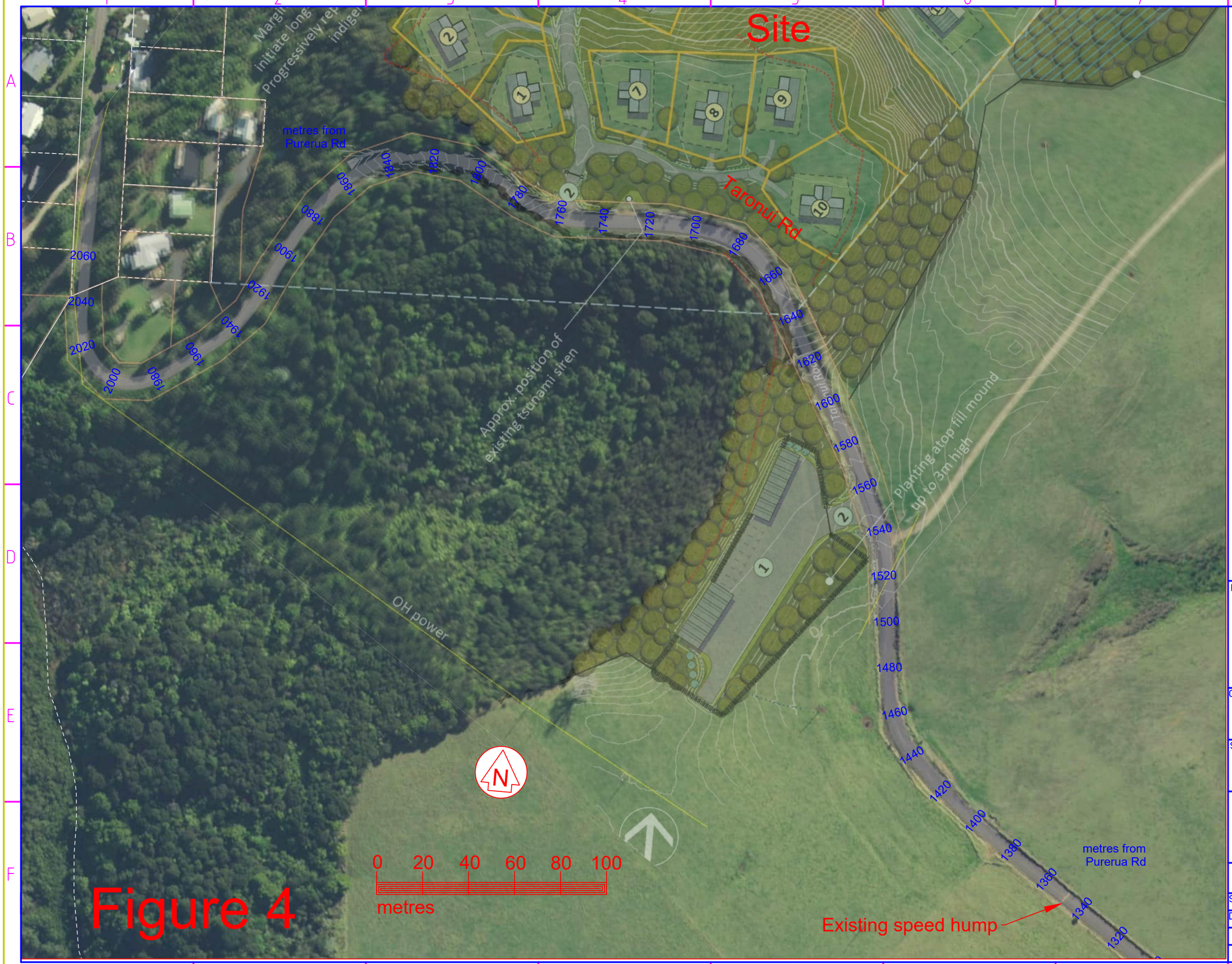
Surveyed by
LINZ
NRC

Amendments

Council ref.

Scale 1: 1500 at A4

Date 17-Mar-2026 15:03:45



Plan

Taronui Rd
1300m
to 2060m

engineering outcomes

PO Box 3048,
Onerahi
Whangarei 0142
Tel. 09 436 5534
info@e-outcomes.co.nz

Project
Subdivision
Taronui Road
Te Tii

Client
Tapuaetahi Incorporation

Surveyed by
LINZ
NRC

Amendments

Council ref.

Scale 1: 1500 at A4

Date 17-Mar-2026 15:03:47

Plan
Internal Access

engineering outcomes
PO Box 3048,
Onerahi
Whangarei 0142
Tel. 09 436 5534
info@e-outcomes.co.nz

Project
Subdivision
Taronui Road
Te Tii

Client
Tapuaetahi Incorporation

Surveyed by
LINZ
NRC

Amendments

Council ref.

Scale 1: 800 at A4

Date 17-Mar-2026 15:03:48

Fig. 6

0 2 4 6 8 10

metres

Taronui Rd

Existing gate

Proposed intersection shoulders; perpendicular with Purerua Road

N

Existing intersection

Purerua Rd

Plan

Purerua Rd
Taronui Rd
Intersection
Realignment
Stage 4

engineering outcomes

PO Box 3048,
Onerahi
Whangarei 0142
Tel. 09 436 5534
info@e-outcomes.co.nz

Project
Subdivision
Taronui Road
Te Tii

Client
Tapuaetahi Incorporation

Surveyed by
LINZ
NRC

Amendments

Council ref.

Scale 1: 100 at A4

Date 17-Mar-2026 15:03:49

Purerua Road has the status of secondary collector road as far as Taronui Road beyond which it has "access" status. Kapiro Road has the status of primary collector road[1].The speed limit on Purerua Road is 100 kilometres per hour although there is a 40 km/hr limit through Te Tii (starting 0.6 kilometres south of Taronui Road) when children are present.

Purerua Road connects to Kapiro Road in a Stop controlled tee intersection. There is no local widening associated with the intersection, but it is lit at night by a single lantern opposite Purerua Road.

Photo 1. A panorama from east (left) to west, centred at the proposed access connection to Taronui Road. A sight bench is proposed at right (at Stage 1) to open up this visibility from a point at least 3 metres behind the edge of Taronui Road.

Photo 2. A typical view of Taronui Road showing one of the existing speed humps. The rocks prevent the humps from being bypassed at excessive speed.

Photo 3. A panorama of Purerua Road from southwest (left) to northeast centred on Taronui Road. Sight distance exceeding the safe-intersection standard – the highest applicable to safety, is available from this point along all vectors.

[1] One Network Framework

4. COUNCIL RULES AND STANDARDS

The *Far North district plan* rule 15.1.6C.1.1c specifies that private access is permitted for access that leads to eight household equivalents and that access leading to nine or more household equivalents is to be a public road. Discretionary land-use consent if required for private access that leads to more than eight household equivalents. Taronui Road already leads to nearly sixty dwellings and most of Access A will lead to as many as twenty[2].

The width standards for public roads are given in Appendix 3B-2 of the Far North district council's operative district plan. For rural access leading more than fifteen household equivalents, those standards specify a carriageway width of 6.5 metres and a corridor width of 20 metres.

Section 3.3.7.4 of the council's engineering standard 2009, which is part of the district plan, specifies that:

Accesses that carry 60 vehicle [movements] *per day or more and have access onto rural roads that are expected to carry fewer than 1,000 vehicles per day in 10 years shall be in accordance with drawing FNDC/S/6D.*

That is, it is specified that such accesses are to have local widening on the priority route to separate vehicles that are turning off that route from others that are not turning. [It is suggested that this clause should read "… **more** than 1,000 vehicles per day…" because FNDC/S/6D specifies a higher standard of crossing than others do. Purerua Road does not carry more than 1,000 vehicle movements per day at Taronui Road.]

5. TRAFFIC

All vehicle movements are one-way movements whether an entry or exit or a movement in one direction along public roads.

5.1 Traffic generation

The traffic generation of the proposal has previously been estimated by video monitoring of the traffic at the Purerua Road/Rangihoua Road intersection and relating it to the numbers of houses in the catchment of the roads at the location of the monitoring. The monitoring was conducted in late 2021, very close to the start of the summer holiday season, and a full count of two days found traffic equivalent to no more than 4.7 movements per household per day. On this basis, annual average daily traffic generation is taken to be 4.5 vehicle movements per household or, say, 90 movements per day for the twenty dwellings proposed.

A large proportion all traffic is expected to travel to and from the south. Beyond Kapiro Road (which Purerua Road connects to), some 60% is expected to travel to/from the east. The exception will be a small number of movements of vehicles towing boats to/from Tapuaetahi Beach.

The traffic generation in this locality is expected to be seasonal, although the new dwellings are not expected to have absentee owners.

[2] The standards are based on a household equivalent generating 10 vehicle movements per day so, as will be seen, twenty dwellings in this location will only generate the traffic of fewer than ten typical household-equivalents.

5.2 Traffic on public roads

The current traffic on Taronui Road is estimated to be in the range 250 to 260 movements on an average day.

Based on the previous monitoring, current traffic on Purerua Road is estimated at 560 movements per day between the end of seal and Taronui Road, with 300 per day beyond Taronui Road. Known subdivision consents on the peninsular, including one of nearly seventy lots, are expected to enable additional traffic of at least another 300 movements per day on this part of Purerua Road.

The traffic on both Taronui Road and Purerua Road is expected to increase by as much as 40% during holiday periods.

5.3 Crashes

The *CAS* crash database has been searched for on all of Purerua Road, including intersections, since the start of 2020. A number of crashes have been reported, two of which resulted in serious injuries. However, every single crash resulted from either a loss of control of a single vehicle or a vehicle swinging wide on a bend.

Not a single crash was reported at any intersections including those of Purerua Road with both Taronui Road and Kapiro Road, nor at either of the single-lane bridges on Purerua Road. Two of the crashes occurred on the unsealed section of Purerua Road south of Taronui Road but only resulted in minor injuries.

There is one location in which more than one injury-causing crash has been reported and in which all relevant factors were similar or identical. It is a bend on Purerua Road at 3.91 kilometres (35°10'09.0"S 173°57'45.5"E), on which two minor-injury causing crashes have been reported involving losses of control of northeast-bound vehicles. There is neither curve warning nor speed advisory on the northeast-bound approach to that bend.

6. ASSESSMENT OF TRAFFIC EFFECTS AND PROPOSED MITIGATION MEASURES

With the proposed improvements (sight benching west of the new access connection to Taronui Road and, in Stage 4, realignment of the Purerua Road/Taronui Road intersection), the key traffic effect of the proposal is the width of Taronui Road. The unsealed surface of 0.5 kilometres of Purerua Road south of Taronui Road, the single lane bridges and standards of the most affected intersections also warrant comment.

While advance curve and/or speed advisory warning(s) would be at least desirable on the bend on Purerua Road at 3.91 kilometres, on which two recent, near identical, injury-causing crashes have been reported, it is important that the measures associated with such warnings be part of a coordinated corridor strategy rather than provided ad hoc in response to particular incidents. [There are numerous other bends on Purerua Road that are at least as tight and/or out of context.]

In light of this, also given that the reported crashes only resulted in minor injuries and did not involve more than one vehicle (and, as such, additional traffic would not increase the associated risk for existing traffic), the only recommendation made is that a corridor investigation be carried out, by the council, into the safety of Purerua Road.

6.1 Access width and geometrics

While Taronui Road is narrower than the council standard for roadways leading to more than fifteen dwellings and Access A will also be narrower than specified, both are concluded to be acceptable with mitigation proposed and for the following reasons:

- As shown, the traffic generation is expected to be less than one-half of that given in the *Far North district plan*, Appendix 3A, for standard residential units[3]. In reality, the proposal will generate the equivalent traffic of no more nine typical dwellings;
- Recent research into the influence of road width on harm found conclusively that the rate of harm increases with increased width, especially with roadways in the width range that includes Taronui Road. The dataset used in this research was all sealed public roads in the entire north island[4]. Many of those roads are geometrically inferior to that of Taronui Road and Access A, so an even lower rate of harm is likely. That research included incidents involving vulnerable road users including pedestrians.

6.2 Other matters

There are no dwellings within 500 metres of the unsealed section of Purerua Road between Taronui Road and the end of seal, so dust nuisance will not arise from the proposal.

With the proposed sight benching, the sight distances associated with the connection point will be well above the safe-stopping sight distance ("SSSD") standard as shown in Figure 5. While SSSD is not the highest standard applicable to safety, the available sight distance is considered at least adequate. In particular, the more restricted direction is to the right of exiting vehicles and a large proportion of exits will be towards the east – left turns. The potential collision angles associated with such turns are relatively acute and the operating speeds are nowhere near the "safe-system" threshold for such collisions.

The sight distances associated with the boat storage and washing facility will all be well above the safe-stopping standard and, as such, more than adequate.

Purerua Road will also be suitable at its current width even with the additional traffic. The remainder of the road routes between the site and all common destinations, including Te Tii, Kerikeri, Waipapa, Whangarei and Auckland, are sealed and of a standard that can easily cope with the relatively low level of additional traffic from this proposal.

There are 544 single-lane bridges in the Far North district alone (including a handful on the State highways). On the three single-lane bridges that the subdivision will increase traffic on, the current daily traffic ranges from 1,290 movements on the more northern Purerua Road structure[5] to nearly 3,000 per day on the Landing Road bridge[6].

[3] Which is 10 movements per unit per day.
[4] While Taronui Road is not a public road, the risk profile of private roadways is virtually identical, so the research is entirely relevant.
[5] Which is at 1.9 kilometres.
[6] Which, now that the Kaeo Bridge has been replaced, is now the single-busiest single-lane bridge in the district.

If known subdivisions on the Purerua peninsular reached full development immediately, the bridges on Purerua Road would be the tenth and twelfth busiest single-lane bridges in the district. The proposal has the potential to move them up by no more than one place again. This is highly conservative because future development is virtually certain in the catchments of all the busiest bridges and this proposal (and approved subdivisions in the catchment) will take time to develop fully. The increase in traffic on the Landing Road bridge will be only a tiny fraction of its total traffic and is unlikely to even be noticed.

No head-on crashes have been reported at either of the bridges on Purerua Road since at least the start of 2020. In fact, the rate of head-on crashes on bridges in the district is remarkably low. Only five such injury-causing crashes have been reported in a recent 5 calendar year period of which only one resulted in more than minor injuries and none resulted in fatalities. The only crash that resulted in serious injuries occurred on a long straight in which high speeds are enabled. A fourth occurred on the old Kaeo Bridge which, until recently replaced, was the single busiest single-lane bridge in the entire region.

The traffic will also remain well below levels that previous analyses, using SIDRA Intersection[7] have concluded that single-lane bridges have capacity for.

No turn treatment is warranted at the Purerua Road/Taronui Road intersection including "Type 2" widening[8] even if it was a public road. In particular, no Type GA crashes (rear-end involving a vehicle turning left into a side road or access) have been reported at any existing unsealed intersections anywhere in the Far North district in the most recent 5 calendar years and there are a very large number of such intersections. More than 98% of turns into Taronui Road are expected to be left turns.

A recent traffic assessment for a large (nearly 70 lot) subdivision on the Purerua peninsular concluded that turn treatment is also not warranted at the Purerua Road/Kapiro Road intersection, although a warning sign was recommended for eastbound traffic on Kapiro Road as it approached the intersection. Additional mitigation is not warranted in relation to this proposal.

The proposal will increase the traffic through the gate at the start of Taronui Road to some 20 to 21 movements during peak hours on typical days, or an average of one every 3 minutes. It takes less than 40 seconds for the PIN to be entered and the gate to open, so no congestion is expected as a result of the proposal[9].

[7] Including of the Landing Road bridge.
[8] Engineering Standards 2023 s3.2.27.4. The intersection falls comfortably into the Type 1 crossing zone even for the dominant left turns into Taronui Road.
[9] Certainly none that could result in vehicles queuing back into Purerua Road – there is space for three cars to queue between the gate and Purerua Road.

7. FAR NORTH DISTRICT PLAN – ASSESSMENT CRITERIA

There are three sets of criteria in the plan relevant to traffic management and access. No assessment is given against the parking criteria in Section 15.1.6B.5, because all parking demand can be accommodated on the lots in accordance with section 15.1.6B, as a permitted activity. Each of the other criteria is quoted here and the assessment is given with each one.

7.1 Rule 15.1.6A.4.1: Traffic Intensity Matters for Consideration

This is an assessment of the proposal against matters that the Council will restrict the exercise of its discretion to with respect to restricted-discretionary activities.

Criterion (a): The time of day when the extra vehicle movements will occur.

The proposal is expected to generate traffic at all times of the day, with typical weekday commuter peak and smaller peaks around midday on Saturdays.

Criterion (b): The distance between the location where the vehicle movements take place and any adjacent properties.

The nearest existing dwelling is more than 150 metres from the access.

Criterion (c): The width and capability of any street to be able to cope safely with the extra vehicle movements.

As shown in section 6.1, Taronui Road will be suitable at its current width even with the additional traffic.

Criterion (d): The location of any footpaths and the volume of pedestrian traffic on them.

There are no footpaths either Taronui Road nor Purerua Road. Foot traffic is expected to be low, especially on Purerua Road. The existing speed control devices and additional advisory signage, will ensure that speeds are generally below the safe-system threshold for vulnerable road users.

Criterion (e): The sight distances associated with the vehicle access onto the street.

Assessment of Criterion (e): This is addressed in section 6.2 and finds that all sight distances are at least adequate.

Criterion (f): The existing volume of traffic on the streets affected.

See section 5.2.

Criterion (g): Any existing congestion or safety problems on the streets affected.

There is no congestion in this locality and no evidence of unusual safety issues on either Taronui Road or Purerua Road.

Criterion (h): With respect to effects in local neighbourhoods, the ability to mitigate any adverse effects through the design of the access, or the screening of vehicle movements, or limiting the times when vehicle movements occur.

The main access is more than 150 metres clear of the nearest existing dwelling, so no targeted mitigation nor other restrictions are warranted.

Criterion (i): With respect to the effects on through traffic on roads with more than 1000 vehicle movements per day, the extent to which Council's "Engineering Standards and Guidelines" (2004) are met.

No roads in this vicinity, including Purerua Road at Taronui Road, are in this category.

Criterion (j): Effects of the activity where it is located within 500m of reserve land administered by the Department of Conservation upon the ability of the Department to manage and administer that land.

The site is not located within 500 metres land administered by the Department of Conservation.

Criterion (k): The provision of safe access for pedestrians moving within or exiting the site

Footpaths are not specified for rural private access. Few people are likely to walk beyond the access because there are no suitable facilities on roadways beyond it. For those that do, the existing speed control devices and additional advisory signage, will ensure that speeds are generally below the safe-system threshold for vulnerable road users.

7.2 Section 15.1.6A.7: General Assessment Criteria, Traffic

This section includes eleven criteria. Criteria (a), (j), (k) and (l) are unique to this section of the plan. Criteria (b) to (i) are identical to criteria (a) to (h) of the assessment criteria in 15.1.6A.4.1, respectively, and have already been assessed in the previous section. This section is restricted to the criteria unique to 15.1.6A.7.

Criterion (a): The extent to which the expected traffic intensity exceeds the threshold set by the Traffic Intensity Factor contained in Appendix 3A in Part 4 of the district plan.

The permitted Traffic Intensity Factor (TIF) threshold for this site is 30 and while the proposal will exceed that TIF by 170 movements[10], in reality as shown, the actual traffic generation will be below 100 movements per day and, as shown, the existing and proposed roadways will be able to cope with it at least adequately.

Criterion (j): With respect to the effects on through traffic on arterial roads, strategic roads and State Highways, any measures such as right-turn bays, flush medians, left-turn deceleration tapers, etc. proposed to be installed on the road as part of the development to accommodate traffic turning into and out of the site.

As shown, both Taronui Road and Purerua Road have more than adequate capacity for its existing traffic plus that from the proposal.

Criterion (k): The extent to which the activity may cause or exacerbate natural hazards or may be adversely affected by natural hazards, and therefore increase the risk to life, property and the environment.

The site access will not cause or exacerbate natural hazards provided its associated earthworks and/or retaining are fully engineered to mitigate all potential natural hazards. This is addressed in the reports of others.

[10] When applying the rate of 10 per household as per the operative district plan Appendix 3A.

Criterion (l): Whether providing or having access to bicycle parking, shower/changing facilities or alternative transportation would reduce the number of vehicle movements associated with the proposed activity.

With the ability for individual occupants to store bicycles and provide associated facilities at their homes, there is little, probably nothing, to be gained by the provision of special facilities.

15.1.6C.4.1 Property Access

Criteria (a) and (b) of this repeat those in other sections and have already been addressed. Specific comment is given for all others.

Criterion (c): Any foreseeable future changes in traffic patterns in the area.

No significant projects or road links are planned that might significantly change the patterns of traffic in this vicinity.

Criterion (d): Possible measures or restrictions on vehicle movements in and out of the access.

With the relatively light traffic and sparse existing development in the locality, there is no need for restrictions on vehicle movements.

Criterion (e): The adequacy of the engineering standards proposed and the ease of access to and from, and within, the site.

This is addressed in detailed section 6 and finds that, subject to sight benching west of the connection of the site access to Taronui Road and advisory signage on Taronui Road, the proposed access widths and geometric standards will be adequate and fit-for-purpose.

Criterion (f): The provision of access for all persons and vehicles likely to need access to the site, including pedestrian, cycle, disabled, vehicular.

The proposed connection to Taronui Road will ensure adequate access to all lots for all transport modes. Pedestrian traffic is expected to be infrequent and cyclists will be able to enter the site safely by way of the access and vehicle crossing connection.

Criterion (g): The provision made to mitigate the effects of stormwater runoff, and any impact of roading and access on waterways, ecosystems, drainage patterns or the amenities of adjoining properties.

The site access will not cause or exacerbate natural hazards provided its associated earthworks and/or retaining are fully engineered to mitigate all potential natural hazards. This is addressed in the reports of others.

Criterion (h) relates to sites with a road frontage on Kerikeri Road so is not relevant.

Criterion (i) The provisions of the roading hierarchy, and any development plans of the roading network.

No significant projects or road links are planned that might significantly change the patterns of traffic in this vicinity.

Criterion (j) relates to alternative access for car parking and vehicle loading in business zones and is not relevant.

Criterion (k) Any need to require provision to be made in a subdivision for the vesting of reserves for the purpose of facilitating connections to future roading extensions to serve surrounding land; future connection of pedestrian accessways from street to street; future provision of service lanes; or planned road links that may need to pass through the subdivision; and the practicality of creating such easements at the time of subdivision application in order to facilitate later development, so is not relevant.

Also Criterion (l) Enter into agreements that will enable the Council to require the future owners to form and vest roads when other land becomes available (consent notices shall be registered on such Certificates of Title pursuant to Rule 13.6.7).

There is nothing to be gained by facilitating access to areas outside the site using the mechanisms described. No internal access has potential outlets to other locations and is private in any event.

Criterion (m) With respect to access to a State Highway that is a Limited Access Road, the effects on the safety and/or efficiency on any State Highway and its connection to the local road network and the provision of written approval from the New Zealand Transport Agency.

The proposal does not lead directly to any State highway.

Appendix

Note: Design contours shown at 0.5m intervals, prepared by Vision Consulting Engineers Ltd. For geothechnical site analysis and storm/waste water design refer to documentation by Vision Consulting Engineers Ltd.

Margin of coastal flank vegetation, initiate long-term weed management. Progressively replace weed species with indigenous, coastal species.

Approx. position of existing tsunami siren

OH power

Taronui Road

Planting atop fill mound up to 3m high

Indicative fence along northern edge of farm/quarry track

GENERAL COASTAL ZONE
COASTAL LIVING ZONE

Legend

- Proposed new lot boundaries
- Proposed building envelope
- Indicative building shown 200m² Single storey Maximum height 5m
- Indicative building shown Two storey/stepped Maximum height 7m
- 10m off-set from crest of slope
- Land application areas
- Reserve land application areas
- (1) Secure boat compound 15 covered storage spaces 8 uncovered storage spaces
- (2) Automatic sliding gate
- (3) Secondary waste water treatment plant
- (4) Storage sheds for dinghies, kayaks and beach equipment
- (5) Indicative walking track route
- (6) Indicative retention pond

Proposed planting

- Indigenous coastal trees
- Indigenous coastal shrubs up to 5m high
- Indigenous coastal shrubs up to 2m high
- Low coastal planting up to 600mm high
- Low indigenous planting up to 1.5m high

Note: Only low flammability shrub and tree species within 10m of building areas.

0 25 50 m

Scale @A3	Project No.	Drawing No.	Rev	Date
1 : 2000	1374	LLA002	A	16/03/2026

CAD REF.: 1371_Tapuaetahi_20251210.vwx

Client: TAPUAETAHI INCORPORATION

Project Title: TAPUAETAHI SUBDIVISION

Title: RC APPLICATION 2026

Sheet Title: OVERALL SITE PLAN

LITTORALIS LANDSCAPE ARCHITECTURE

Proposed staging

- Proposed lot boundaries
- **Stage 1**: Lots 1, 2, 3
- **Stage 2**: Lots 7, 8, 9, 10
- **Stage 3**: Lots 4, 5, 6, 11, 12, 15 and formation of the stormwater pond
- **Stage 4**: Lots 13, 16, 17, 19, 20
- **Stage 5**: Lots 14, 18
- **Stage 6**: Boat storage compound

Scale @A3	Project No.	Drawing No.	Rev	Client	Project Title	Title
as shown	1374	LLA005	A	TAPUAETAHI INCORPORATION	TAPUAETAHI SUBDIVISION	RC APPLICATION 2026

0 25 50 m

Date: 16/03/2026

Sheet Title: STAGING PLAN

CAD REF.: 1371_Tapuaetahi_20251210.vwx

LITTORALIS LANDSCAPE ARCHITECTURE

Appendix F
VISION Stormwater Calculations

Stormwater Design Sheet

Weighted Runoff Coefficient

Site: Tapuaetahi Development
Date: 15/07/2025
Project: J15724
Client: Tapuaetahi Incorporation
By: CS
Reviewed: BCP
Method: NZ Building Code, E1 Surface Water

VISION CONSULTING ENGINEERS

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	1					
Grass		287	0.40	114.8	115	10
Road		173	0.90	155.7	156	10
Slope adjustment			0.00			
Total		460	0.59			

Decription	Drainage Area No	Area	C	C x A	Sum	Tc
	2					
Grass		270	0.40	108	108	10
Road		150	0.90	135	135	10
Slope adjustment			0.00			
Total		420	0.58			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	3					
Grass		1330	0.40	532	532	10
Road		400	0.90	360	360	10
Slope adjustment			0.00			
Total		1730	0.52			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	4					
Grass		290	0.40	116	116	10
Road		150	0.90	135	135	10
Slope adjustment			0.05			
Total		440	0.62			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	5A/B					
Grass		1144	0.40	457.6	458	10
Road		250	0.90	225	225	10
Slope adjustment			0.10			
Total		1394	0.59			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	6					
Grass		3430	0.40	1372	1372	10
Road		1050	0.90	945	945	10
Slope adjustment			0.05			
Total		4480	0.57			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	7					
Grass		6700	0.40	2680	2680	10
Road		1500	0.90	1350	1350	10
Slope adjustment			0.05			
Total		8200	0.54			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	8					
Grass		2920	0.40	1168	1168	10
Road		500	0.90	450	450	10
Slope adjustment			0.05			
Total		3420	0.52			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	9					
Grass		14109	0.40	5644	5644	10
Road		1000	0.90	900	900	10
Slope adjustment			0.05			
Total		15109	0.48			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	10					
Grass		7478	0.40	2991	2991	10
Road		1200	0.90	1080	1080	10
Slope adjustment			0.05			
Total		8678	0.52			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	11					
Grass		5800	0.40	2320	2320	10
Road		1200	0.90	1080	1080	10
Slope adjustment			0.05			
Total		7000	0.54			

Decription	Drainage Area No	(m)	C	C x A	C x A	(min)
Small cut of drains						
Grass		1445	0.40	578	578	10
Road		500	0.90	450	450	10
Slope adjustment			0.05			
Total		1945	0.58			

Decription	Drainage Area No	(m)	C	C x A	C x A	(min)
	12					
Grass		1374	0.40	549.6	550	10
Road		800	0.90	720	720	10
Slope adjustment			0.05			
Total		2174	0.63			

Decription	Drainage Area No	(m)	C	C x A	C x A	(min)
	13					
Grass		853	0.40	341.2	341	10
Road		731	0.90	657.9	658	10
Slope adjustment			0.05			
Total		1584	0.68			

Decription	Drainage Area No	(m)	C	C x A	C x A	(min)
	14					
Grass		330	0.40	132	132	10
Road		0	0.90	0	0	10
Slope adjustment			0.05			
Total		330	0.45			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	15					
Grass		6035	0.40	2414	2414	10
Road		2855	0.90	2570	2570	10
Slope adjustment			0.05			
Total		8890	0.61			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	16					
Grass		542	0.40	216.8	217	10
Road		48	0.90	43.2	43	10
Slope adjustment			0.05			
Total		590	0.49			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	A					
Grass		41996	0.40	16798	16798	10
Road		0	0.90	0	0	10
Slope adjustment			0.05			
Total		42885	0.44			

Decription	Drainage Area No	Area (m)	C	C x A	Sum C x A	Tc (min)
	A'					
Grass		19466	0.40	7786	7786	10
Road		2500	0.90	2250	2250	10
Slope adjustment			0.05			
Total		21966	0.51			

Stormwater Design Sheet

Time of Concentration

Client	Tapuaetahi Incorporation
Site	Tapuaetahi Development
Designer	CS
Date	15/07/2025

Rational Method (Equal Area)

Catchment	L (m)	h (m)	TOC (min)
9	165	16	2.4

Catchment with the longest flow path

Use 10 min for all catchments

Stormwater Design Sheet

HIRDS V4 Data

Client	Tapuaetahi Incorporation
Project	J15724
Site	Tapuaetahi Development
Designed by	CS
Approvd by	BCP
Date	15/07/2025
Scenario	RCP6.0 for the period 2081-2100

HIRDS V4 Intensity-Duration-Frequency Results
Sitename: Custom Location
Coordinate system: WGS84
Longitude: 173.9864
Latitude: -35.1244

DDF Model	Parameters:	c	d	e	f	g	h	i
	Values:	0.001996	0.504315	-0.02238	-0.00269	0.255075	-0.01168	3.250212
	Example:	Duration (h	ARI (yrs)	x	y	Rainfall Rate (mm/hr)		
		24	100	3.178054	4.600149	10.15413		

Rainfall intensities (mm/hr) :: Historical Data

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	59.2	43.4	36	25.8	18.1	9.72	6.29	3.9	2.31	1.67	1.3	1.07
2	0.5	64.9	47.6	39.5	28.3	19.8	10.7	6.91	4.29	2.55	1.83	1.43	1.18
5	0.2	84.2	61.8	51.3	36.8	25.9	14	9.05	5.63	3.35	2.41	1.89	1.55
10	0.1	98.4	72.3	60.1	43.2	30.4	16.4	10.6	6.63	3.94	2.84	2.23	1.83
20	0.05	113	83	69	49.6	34.9	18.9	12.3	7.66	4.56	3.29	2.58	2.12
30	0.033	121	89.4	74.3	53.5	37.7	20.4	13.3	8.28	4.93	3.56	2.79	2.29
40	0.025	128	94	78.2	56.3	39.6	21.5	14	8.72	5.2	3.75	2.94	2.42
50	0.02	132	97.5	81.1	58.4	41.2	22.3	14.5	9.07	5.41	3.9	3.06	2.52
60	0.017	136	100	83.6	60.2	42.4	23	15	9.35	5.58	4.03	3.16	2.6
80	0.013	142	105	87.4	63	44.4	24.1	15.7	9.8	5.85	4.22	3.31	2.73
100	0.01	147	109	90.4	65.1	46	25	16.2	10.2	6.06	4.38	3.43	2.83
250	0.004	166	123	102	73.9	52.2	28.4	18.5	11.6	6.92	5	3.93	3.23

Rainfall intensities (mm/hr) :: RCP6.0 for the period 2081-2100

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	70.7	51.8	43	30.8	21.4	11.2	7.11	4.35	2.53	1.8	1.4	1.15
2	0.5	77.8	57	47.3	33.9	23.6	12.4	7.87	4.8	2.8	2	1.55	1.27
5	0.2	102	74.7	62	44.5	31.1	16.4	10.4	6.35	3.71	2.65	2.06	1.69
10	0.1	119	87.8	72.9	52.4	36.6	19.3	12.3	7.51	4.39	3.14	2.45	2
20	0.05	137	101	84	60.4	42.2	22.3	14.2	8.68	5.1	3.64	2.84	2.32
30	0.033	148	109	90.6	65.2	45.6	24.1	15.4	9.4	5.52	3.95	3.08	2.52
40	0.025	155	115	95.2	68.6	48	25.5	16.2	9.91	5.82	4.17	3.24	2.66
50	0.02	161	119	99	71.3	49.9	26.4	16.9	10.3	6.06	4.33	3.38	2.76
60	0.017	166	123	102	73.4	51.4	27.3	17.4	10.6	6.25	4.48	3.49	2.85
80	0.013	174	128	107	76.9	53.9	28.6	18.3	11.2	6.56	4.7	3.66	3
100	0.01	180	133	110	79.6	55.8	29.6	18.9	11.6	6.8	4.87	3.8	3.11
250	0.004	203	150	125	90.2	63.3	33.7	21.6	13.2	7.77	5.56	4.34	3.56

Stormwater Design Sheet

HIRDS V4 Data

Client	Tapuaetahi Incorporation
Project	J15724
Site	Tapuaetahi Development
Designed by	CS
Approvd by	BCP
Date	15/07/2025
Scenario	RCP6.0 for the period 2081-2100

HIRDS V4 Depth-Duration-Frequency Results
Sitename: Custom Location
Coordinate system: WGS84
Longitude: 173.9864
Latitude: -35.1244

DDF Model

Parameters:	c	d	e	f	g	h	i
Values:	0.001996	0.504315	-0.02238	-0.00269	0.255075	-0.01168	3.250212

Example:	Duration (h	ARI (yrs)	x	y	Rainfall Depth (mm)
	24	100	3.178054	4.600149	243.6992

Rainfall depths (mm) :: Historical Data

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	9.87	14.5	18	25.8	36.1	58.3	75.4	93.7	111	120	125	128
2	0.5	10.8	15.9	19.7	28.3	39.7	64.1	82.9	103	122	132	138	141
5	0.2	14	20.6	25.7	36.8	51.8	83.8	109	135	161	174	181	186
10	0.1	16.4	24.1	30	43.2	60.7	98.4	128	159	189	205	214	220
20	0.05	18.8	27.7	34.5	49.6	69.9	113	147	184	219	237	248	254
30	0.033	20.2	29.8	37.2	53.5	75.4	122	159	199	237	256	268	275
40	0.025	21.3	31.3	39.1	56.3	79.3	129	168	209	249	270	282	290
50	0.02	22.1	32.5	40.6	58.4	82.4	134	174	218	259	281	294	302
60	0.017	22.7	33.5	41.8	60.2	84.9	138	180	224	268	290	303	312
80	0.013	23.7	35	43.7	63	88.8	145	188	235	281	304	318	327
100	0.01	24.5	36.2	45.2	65.1	91.9	150	195	244	291	315	330	339
250	0.004	27.7	41	51.2	73.9	104	170	222	278	332	360	377	388

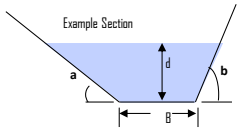
Rainfall depths (mm) :: RCP6.0 for the period 2081-2100

ARI	AEP	10m	20m	30m	1h	2h	6h	12h	24h	48h	72h	96h	120h
1.58	0.633	11.8	17.3	21.5	30.8	42.7	67.3	85.3	104	122	130	135	138
2	0.5	13	19	23.7	33.9	47.2	74.3	94.4	115	134	144	149	152
5	0.2	17	24.9	31	44.5	62.1	98.1	125	152	178	191	198	203
10	0.1	19.9	29.3	36.5	52.4	73.2	116	148	180	211	226	235	240
20	0.05	22.9	33.7	42	60.4	84.5	134	171	208	245	262	273	279
30	0.033	24.7	36.3	45.3	65.2	91.2	145	185	226	265	284	295	302
40	0.025	25.9	38.2	47.6	68.6	96	153	195	238	279	300	311	319
50	0.02	26.9	39.7	49.5	71.3	99.8	159	202	247	291	312	324	332
60	0.017	27.7	40.8	51	73.4	103	164	209	256	300	322	335	342
80	0.013	29	42.8	53.4	76.9	108	172	219	268	315	338	351	360
100	0.01	30	44.2	55.2	79.6	112	178	227	278	326	350	365	373
250	0.004	33.9	50	62.5	90.2	127	202	259	317	373	401	417	427

Stormwater Design Sheet

Open Drain Design

Client	Tapuaetahi Incorporation
Project	J15724
Site	Tapuaetahi Development
Designed by	CS
Approvd by	BCP
Date	15/07/2025
Scenario	RCP6.0 for the period 2081-2100



	Drainage Area										Open Drain Dimensions & Character							Drain Data				Checks		
Decription	Open Drain ID	No	Area (m)	C	C x A	Sum C x A	Total Drainage Area (m^2)	Tc (min)	I (mm/hr)	Flow $Q(m^3/s)$	B (m)	a (°)	b (°)	Surface	n Mannings	S (%)	d (m)	A (m^2)	P (m)	R (m)	Provisional Flows Q (m^3/s)	υ (m/s)	υ·d (m^2/s)	COMMENTS
Open Drains																								
Development Site																								
Roadway A RH at intersection	1	1	460	0.59	270.5	271	460	10	180.0	0.014	0.5	21.8	26.0	SWALE	0.100	4.8	0.069	0.05	0.84	0.05	0.014	0.31	0.02	
Roadway A LH at intersection	1	2	420	0.58	243	243	420	10	180.0	0.012	0.5	21.8	26.0	SWALE	0.100	4.8	0.065	0.04	0.82	0.05	0.013	0.30	0.02	
Roadway B RH	2	3	1730	0.52	892	892	1730	10	180.0	0.045	0.5	21.8	26.0	SWALE	0.100	1	0.192	0.18	1.46	0.12	0.045	0.25	0.05	
Roadway B LH	2	4	440	0.62	273	273	440	10	180.0	0.014	0.5	21.8	26.0	SWALE	0.100	1	0.107	0.08	1.03	0.08	0.014	0.18	0.02	
Conmbined Roadway B outlet drain	3	3+ 4+ 5	3564	0.56	1987	1987	3564	10	180.0	0.099	0.5	21.8	21.8	SWALE	0.100	1	0.276	0.33	1.99	0.17	0.099	0.30	0.08	
Conmbined Roadway B outlet drain steep	4	3+ 4+ 5	3564	0.56	1987	1987	3564	10	180.0	0.099	0.5	21.8	21.8	SWALE	0.100	9	0.162	0.15	1.37	0.11	0.099	0.68	0.11	
Roadway A (35-200) RH	2	6	4480	0.57	2541	2541	4480	10	180.0	0.127	0.5	26.0	21.8	SWALE	0.100	12	0.174	0.16	1.37	0.11	0.127	0.82	0.14	
Roadway A (35-210) LH	5	7	8200	0.54	4440	4440	8200	10	180.0	0.222	0.5	26.0	21.8	SWALE	0.100	12	0.229	0.23	1.64	0.14	0.222	0.95	0.22	
Roadway A (210-end) LH	6	8	3420	0.52	1789	1789	3420	10	180.0	0.089	0.5	26.0	21.8	SWALE	0.100	1	0.27	0.3	1.84	0.16	0.090	0.30	0.08	
Roadway A (200-outlet) RH	7	9+ 6+ 7+ 5+ 4+ 3	31353	0.52	16267.05	16267	31353	10	180.0	0.813	1	26.0	21.8	SWALE	0.100	1	0.638	1.56	4.17	0.37	0.813	0.52	0.33	
Roadway C RH	8	10	8678	0.52	4505.1	4505	8678	10	180.0	0.225	0.5	26.0	21.8	SWALE	0.100	2.5	0.335	0.42	2.17	0.2	0.225	0.53	0.18	
Roadway C LH	8	11	7000	0.54	3750	3750	7000	10	180.0	0.188	0.5	26.0	21.8	SWALE	0.100	2.5	0.319	0.39	2.09	0.19	0.203	0.52	0.17	
Small Cut off Drains	9	Varies	1900	0.58	1099.216	1099	1900	10	180.0	0.055	0	21.8	21.8	SWALE	0.100	1	0.29	0.21	1.56	0.13	0.055	0.26	0.08	
Culvert A/C4 Outlet	4	8	3420	0.52	1789	1789	3420	10	180.0	0.089	0.5	21.8	21.8	SWALE	0.100	8	0.158	0.14	1.35	0.1	0.089	0.63	0.10	
Boat Storage Yard																								
North of Entrance	2	12	2174	0.63	1378.3	1378	2174	10	180.0	0.069	0.5	26.0	21.8	SWALE	0.050	3	0.126	0.1	1.13	0.09	0.068	0.69	0.09	
Toronui Road south of entrance	8	12+ 13+ 14+ 15	12978	0.62	8033.1	8033	12978	10	180.0	0.402	0.5	26.0	21.8	SWALE	0.050	3	0.311	0.38	2.05	0.18	0.421	1.12	0.35	
Boat Strorage Yaard Cut off Drain west	10	13	1584	0.68	1078.3	1078	1584	10	180.0	0.054	0.2	26.0	21.8	SWALE	0.100	1	0.26	0.21	1.49	0.14	0.055	0.27	0.07	
Boat Storage Yard Cut off Drain south	11	16	590	0.49	289.5	290	590	10	180.0	0.014	0.2	26.0	21.8	SWALE	0.100	1	0.145	0.08	0.92	0.08	0.015	0.19	0.03	
Boat Storage Yard Outlet Drain	12	14+ 16	920	0.48	438	438	920	10	180.0	0.022	0.2	21.8	21.8	SWALE	0.100	6.5	0.112	0.05	0.8	0.07	0.022	0.42	0.05	
Secondary Flow over roads																								
Toronui Road Crossing		1	460	0.59	270.5	271	460	10	180.0	0.014														
Roadway A and C Intersection		7	8200	0.54	4440	4440	8200	10	180.0	0.222														
Roadway B End		3	1730	0.52	892	892	1730	10	180.0	0.045	1.2	2.0	3.4	ROAD	0.020	5	0.015	0.02	1.91	0.01	0.015	0.61	0.01	
Roadway C End		10	8678	0.52	4505.1	4505	8678	10	180.0	0.225	2	0.6	1.2	ROAD	0.020	3	0.049	0.27	9.06	0.03	0.223	0.83	0.04	
Roadway A End		8	3420	0.52	1789	1789	3420	10	180.0	0.089	1	1.7	0.6	ROAD	0.020	3	0.028	0.08	4.61	0.02	0.045	0.57	0.02	
Over land flow path at exit of large swale		9+ 6+ 7+ 5+ 4+ 3	31353	0.52	16267.05	16267	31353	10	180.0	0.813	0	1.5	4.6	SWALE	0.100	7	0.228	1.31	11.5	0.11	0.814	0.62	0.14	
Over land flow path at exit of large swale	12	C+ 9+ 8+ 7+ 6+ 5+	37040	0.52	19189.55	19190	37040	10	180.0	0.959	0	4.9	2.9	SWALE	0.100	11.5	0.263	1.09	8.32	0.13	0.959	0.88	0.23	
Scruffy Dome																								
Existing Scruffy dome	A	A	41996	0.45	18898.2	18898	41996	10	147.0	0.772														
New to Scruffy Dome	A'	A'	21926	0.51	11182.26	11182	21926	10	180.0	0.559														

[1] The design flow is based on approximated calculations using Rational Method.
[2] It is assuned that there are no inlet losses.
[3] Velocity is calculated based upon full-flow conditions for the 'Design Capactiy'.

Site
Stormwater Design Sheet

Client	Tapuaetahi Incorporation
Project	J15724
Site	Tapuaetahi Development
Designed by	CS
Approvd by	BCP
Date	15/07/2025
Scenario	RCP6.0 for the period 2081-2100

			Drainage Area									Conduit Chraracteristics											
Reference	U/S MH	D/S MH	No	Area (m)	C	C x A	Sum C x A	Total Drainage Area (m^2)	Tc (min)	I (mm/hr)	Flow $Q(m^3/s)$	U/S Elevation (m)	D/S Elevation (m)	Pipe Length (m)	Grade (%)	Shape (mm)	Pipe Span (mm)	Pipe Rise (mm)	Pipe Area (m^2)	Hydraulic Radius (m)	Manning's n	Design Capacity (m^3/s)	Velocity[3] (m/s)	COMMENTS
Roadway A-C1				460	0.59	270.5	271	460	10	119.0	0.009			10.500	1.9	Circular	300	300	0.071	0.075	0.013	0.133	0.1	
Roadway A1-C2				1730	0.52	892	892	1730	10	119.0	0.029			6.600	1.14	Circular	300	300	0.071	0.075	0.013	0.103	0.4	
Roadway A-C3				8200	0.54	4440	4440	8200	10	119.0	0.147			11.750	1.06	Circular	375	375	0.11	0.09375	0.013	0.181	1.3	
Roadway A-C4				3420	0.52	1789	1789	3420	10	119.0	0.059			13.300	9.7	Circular	300	300	0.071	0.075	0.013	0.301	0.8	
Roadway A-C5				200	0.90	180	180	200	10	119.0	0.006			13.900	1	Circular	300	300	0.071	0.075	0.013	0.097	0.1	
Roadway A2-C6				8678	0.52	4505	4505	8678	10	119.0	0.149			13.500	1	Circular	375	375	0.11	0.09375	0.013	0.175	1.3	
Boat Storage Yard-C1				1378.3	0.63	868.3	868	1378	10	119.0	0.029			13.500	1	Circular	300	300	0.071	0.075	0.013	0.097	0.4	

[1] The design flow is based on approximated calculations using Rational Method. Flows entering the pipe network may be significantly less than the design flow due to inlet efficiencies and blockages.
[2] It is assuned that there are no inlet losses.
[3] Velocity is calculated based upon full-flow conditions for the 'Design Capactiy'.
[4] Hydraulic Grade is not assessed due to topography.

Site

Stormwater Design Sheet

Client	Tapuaetahi Incorporation
Project	J15724
Site	Tapuaetahi Development
Designed by	CS
Approvd by	BCP
Date	15/07/2025
Scenario	RCP6.0 for the period 2081-2100

	Drainage Area									Conduit Chraracteristics									Pipe Part-full Design Outputs						
Reference	No	Area (m)	C	C x A	Sum C x A	Total Drainage Area (m^2)	Tc (min)	I (mm/hr)	Design Pipe Flow Q(m^3/s)	U/S Elevation (m)	D/S Elevation (m)	Pipe Length (m)	Grade (%)	Pipe Span (mm)	Full Pipe Area (m^2)	Full Hydraulic Radius (m)	Full Manning's n	Full-flow Pipe Capacity (m^3/s)	Actual Flow Area (m^2)	Actual depth of flow in pipe (m)	Actual Hydraulic Radius (m)	Part-full Manning's n	Part-full Design Capacity (m^3/s)	Actual Velocity[3] (m/s)	COMMENTS
Roadway A-C1	1	460	0.59	270.5	271	460	10	119.0	0.009			10.50	1.9	300	0.071	0.075	0.013	0.133	0.00989	0.05926	0.03578	0.016558	0.009	0.9	GRASSED OUTLET OK
Roadway A1-C2	3	1730	0.52	892	892	1730	10	119.0	0.029			6.60	1.14	300	0.071	0.075	0.013	0.103	0.0279	0.12507	0.06624	0.016555	0.029	1.1	GRASSED OUTLET OK
Roadway A-C3	7	8200	0.54	4440	4440	8200	10	119.0	0.147			11.75	1.06	375	0.11	0.09375	0.013	0.181	0.08689	0.27526	0.12247	0.015031	0.147	1.7	GRASSED OUTLET OK
Roadway A-C4	8	3420	0.52	1789	1789	3420	10	119.0	0.059			13.30	9.7	300	0.071	0.075	0.013	0.301	0.02138	0.10265	0.05703	0.016696	0.059	2.8	Rip Rap Protection Required
Roadway A-C5	-	200	0.90	180	180	200	10	119.0	0.006			13.90	1	300	0.071	0.075	0.013	0.097	0.00929	0.05674	0.03441	0.016527	0.006	0.6	GRASSED OUTLET OK
Roadway A2-C6	10	8678	0.52	4505	4505	8678	10	119.0	0.149			13.50	1	375	0.11	0.09375	0.013	0.175	0.10414	0.33504	0.08839	0.013877	0.149	1.4	GRASSED OUTLET OK
Boat Storage Yard-C1	12	2174	0.63	1370	1370	2174	10	119.0	0.045			19.20	5.22	300	0.071	0.075	0.013	0.221	0.02205	0.10502	0.05805	0.016686	0.045	2.1	Rip Rap Protection Required

[1] The design flow is based on approximated calculations using Rational Method. Flows entering the pipe network may be significantly less than the design flow due to inlet efficiencies and blockages.
[2] It is assuned that there are no inlet losses.
[3] Velocity is calculated based upon part-full flow conditions for the 'Design Pipe Flow'.
[4] Pipe elevations, grades, and lengths have been estiamted from LiDAR data and are considered indicative.

Taronui Road - Roadway A Road Overtopping

Chainage 6 m

Site: Tapuaetahi Development
Date: 15/07/2025
Project: J15724
Client: Tapuaetahi Incorporation
By: CS
Reviewed: BCP
Method: BROAD CRESTED WEIR - TP10, page 5-13

Design input:

Design Q= 0.013525 m3/s
$=0.57(2g)^{1/2}(2/3Lh^{3/2}+8/30Z_Lh^{5/2}+8/30Z_Rh^{5/2})$, where $g=9.81m/s^2$

Section 1

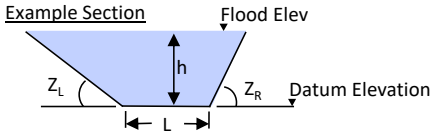
L=	1.6	m
Z_L=	20	m
Z_R=	20	m
Datum	0.000	m Elev

Calculation Output:

SECTION 1

h (m)	**Q** (m3/s)
0.026	0.014

Flood Elev	0.026	m Elev



Boat Storage Yard Crossing - Road Overtopping

Site:	Tapuaetahi Development
Date:	15/07/2025
Project:	J15724
Client:	Tapuaetahi Incorporation
By:	CS
Reviewed:	BCP
Method:	BROAD CRESTED WEIR - TP10, page 5-13

Design input:

Design Q= 0.068915 m3/s

$=0.57(2g)^{1/2}(2/3Lh^{3/2}+8/30Z_Lh^{5/2}+8/30Z_Rh^{5/2})$, where $g=9.81m/s^2$

Section 1

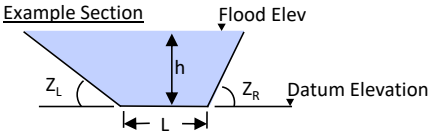
L=	0	m
Z_L=	77	m
Z_R=	77	m
Datum	0.000	m Elev

Calculation Output:

SECTION 1

h (m)	**Q** (m3/s)
0.054	0.070

Flood Elev	0.054	m Elev



Roadway A - Roadway A2 Intersection Overtopping

Chainage 204 m

Site: Tapuaetahi Development
Date: 15/07/2025
Project: J15724
Client: Tapuaetahi Incorporation
By: CS
Reviewed: BCP
Method: BROAD CRESTED WEIR - TP10, page 5-13

Design input:

Design Q= 0.222 m3/s

$=0.57(2g)^{1/2}(2/3Lh^{3/2}+8/30Z_Lh^{5/2}+8/30Z_Rh^{5/2})$, where $g=9.81m/s^2$

Section 1

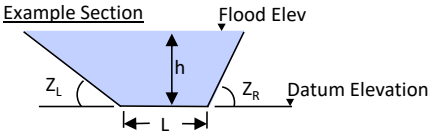
L=	3	m
Z_L=	20	m
Z_R=	24	m
Datum	0.000	m Elev

Calculation Output:

SECTION 1

h (m)	**Q** (m3/s)
0.093	0.222

Flood Elev 0.093 m Elev



Roadway A1 End - Road Overtopping

Chainage 75 m

Site: Tapuaetahi Development
Date: 15/07/2025
Project: J15724
Client: Tapuaetahi Incorporation
By: CS
Reviewed: BCP
Method: BROAD CRESTED WEIR - TP10, page 5-13

Design input:

Design Q= 0.0446 m3/s

$=0.57(2g)^{1/2}(2/3Lh^{3/2}+8/30Z_Lh^{5/2}+8/30Z_Rh^{5/2})$, where $g=9.81m/s^2$

Section 1

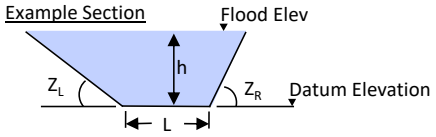
L=	1	m
Z_L=	20	m
Z_R=	24	m
Datum	0.000	m Elev

Calculation Output:

SECTION 1

h (m)	**Q** (m3/s)
0.056	0.045

Flood Elev	0.056	m Elev



Roadway A2 End - Road Overtopping

Chainage 120 m

Site: Tapuaetahi Development
Date: 15/07/2025
Project: J15724
Client: Tapuaetahi Incorporation
By: CS
Reviewed: BCP
Method: BROAD CRESTED WEIR - TP10, page 5-13

Design input:

Design Q= 0.225255 m3/s
$=0.57(2g)^{1/2}(2/3Lh^{3/2}+8/30Z_Lh^{5/2}+8/30Z_Rh^{5/2})$, where $g=9.81m/s^2$

Section 1

L=	3	m
Z_L=	20	m
Z_R=	24	m
Datum	0.000	m Elev

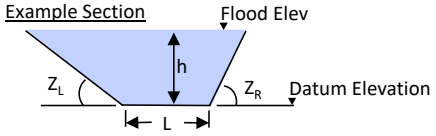
Calculation Output:

SECTION 1

h (m)	**Q** (m3/s)
0.094	0.226

Flood Elev 0.094 m Elev

Example Section



Roadway A End - Road Overtopping

Chainage 345 m

Site: Tapuaetahi Development
Date: 15/07/2025
Project: J15724
Client: Tapuaetahi Incorporation
By: CS
Reviewed: BCP
Method: BROAD CRESTED WEIR - TP10, page 5-13

Design input:

Design Q= 0.08945 m3/s
$=0.57(2g)^{1/2}(2/3Lh^{3/2}+8/30Z_Lh^{5/2}+8/30Z_Rh^{5/2})$, where $g=9.81m/s^2$

Section 1

L=	4	m
Z_L=	100	m
Z_R=	80	m
Datum	0.000	m Elev

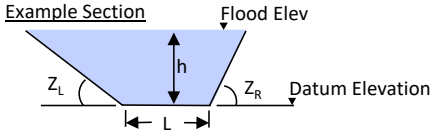
Calculation Output:

SECTION 1

h (m)	**Q** (m3/s)
0.039	0.090

Flood Elev 0.039 m Elev

Example Section



Appendix G
VISION Pavement Calculations

Tapuaetahi - Pavement Design

ROAD DESIGN

AADT = Annual Average Daily Traffic

$DESA = ESA/H_{VAG} \times 365 \times CGF \times AADT \times DF \times HV\% \div 100 \times LDF \times N_{HVAG}$

ESA/H_{VAG} =	0.6		
AADT =	90		
DF =	0.5	(50% of traffic in each lane)	
HV% =	10	%	
CGF =	20.2	R =	0.1 %
		P =	20 yr
LDF =	1		
N_{HVAG} =	2		
DESA =	3.98E+04		
CBR=	7		

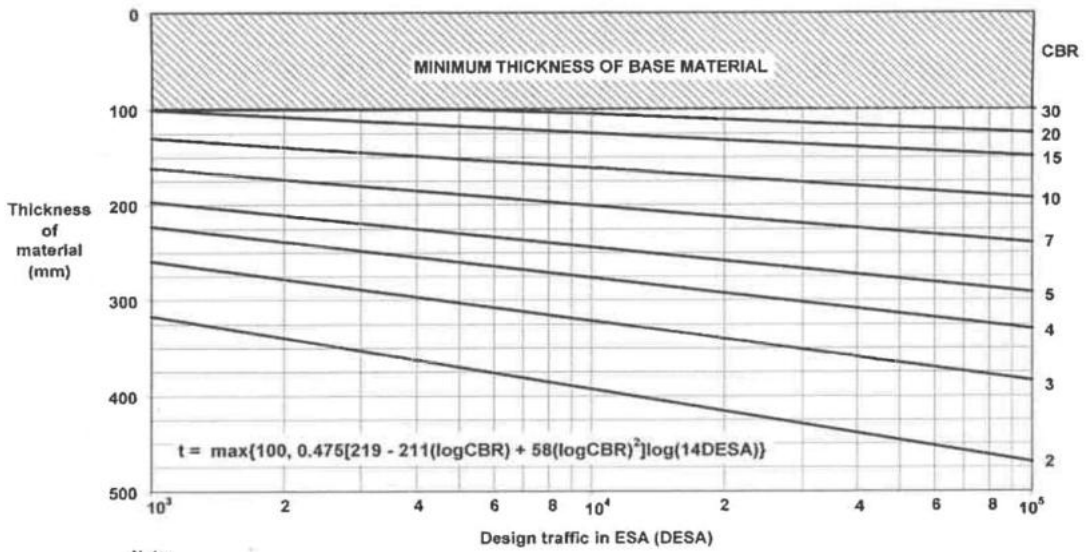
Numeric minimum thickness

100 mm, Minimum Thickness of Basecourse Material
124 mm, Minimum Thickness of Sub-base Material (CBR=7)

DESIGN ROAD THICKNESS

100 mm, Minimum Thickness of Basecourse Material
125 mm, Minimum Thickness of Sub-base Material

Note: Subgrade CBR to be checked prior to placement of Sub-base to confirm CBR is a minimum of 7.



Note:
1. Appropriate local conditions, environmental and drainage issues must be considered in using these design curves.
2. Thin asphalt surfacings may be included in total granular thickness. However, the minimum thickness of the granular base is 100 mm.

Tapuaetahi - Pavement Design

ROAD DESIGN

AADT = Annual Average Daily Traffic

DESA = ESA/H_{VAG} x 365 x CGF × AADT × DF × HV% ÷ 100 × LDF x N_{HVAG}

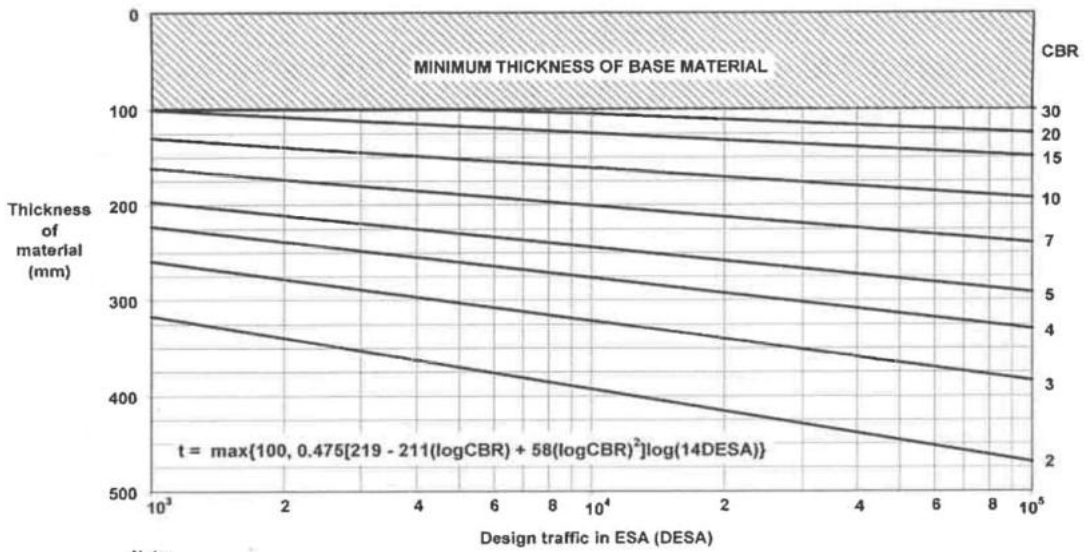
ESA/H_{VAG} =	0.6		
AADT =	30	15 units therefore 30 movements daily)	
DF =	0.5	(50% of traffic in each lane)	
HV% =	10	%	
CGF =	20.2	R =	0.1 %
		P =	20 yr
LDF =	1		
N_{HVAG} =	2		

DESA = 1.33E+04
CBR= 7

Numeric minimum thickness
100 mm, Minimum Thickness of Basecourse Material
105 mm, Minimum Thickness of Sub-base Material

DESIGN ROAD THICKNESS
100 mm, Minimum Thickness of Basecourse Material
105 mm, Minimum Thickness of Sub-base Material

Note: Subgrade CBR to be checked prior to placement of Sub-base to confirm CBR is a minimum of 7.



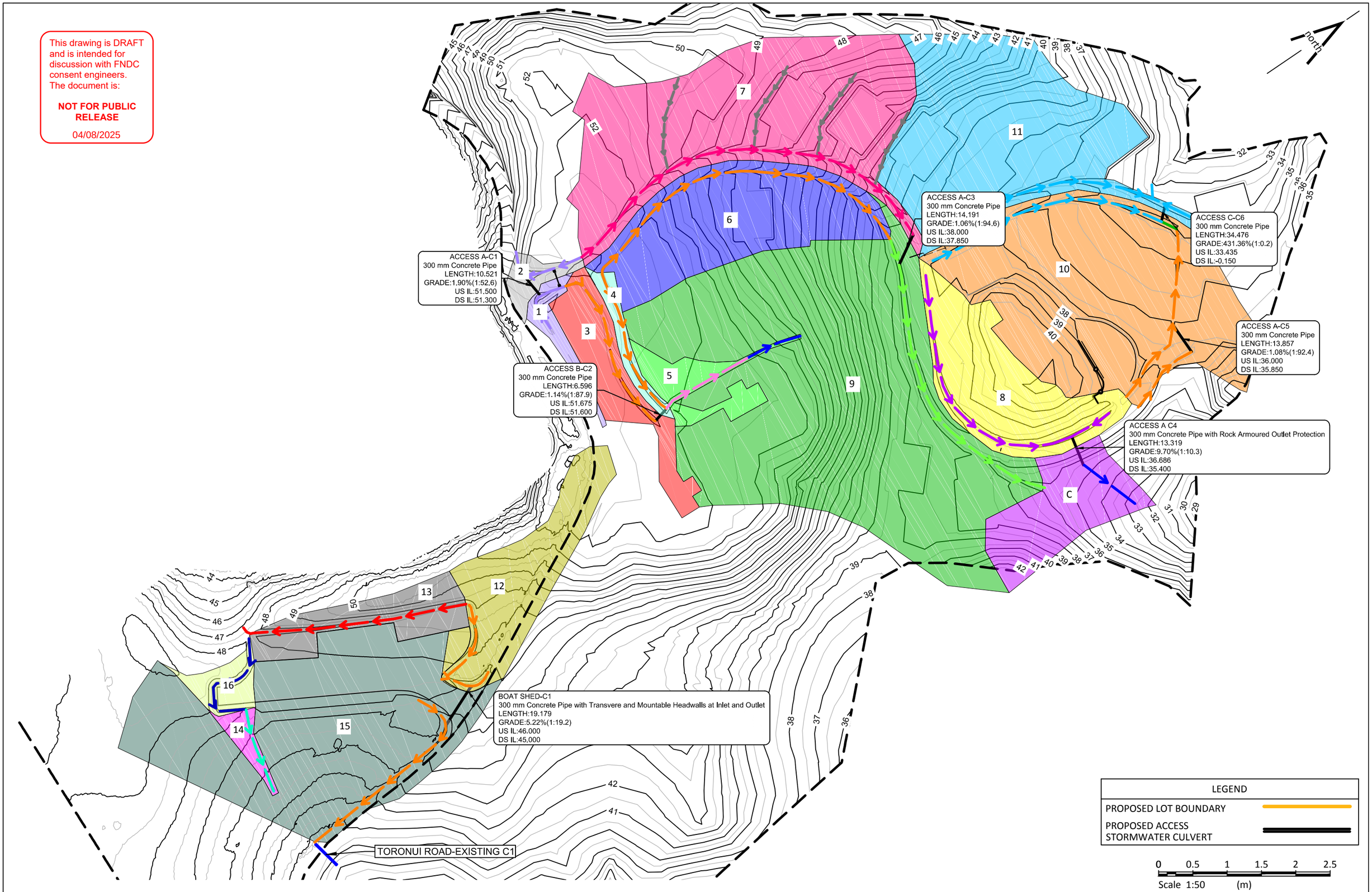
Note:
1. Appropriate local conditions, environmental and drainage issues must be considered in using these design curves.
2. Thin asphalt surfacings may be included in total granular thickness. However, the minimum thickness of the granular base is 100 mm.

Appendix H
VISION Catchment Plan

This drawing is DRAFT and is intended for discussion with FNDC consent engineers. The document is:

NOT FOR PUBLIC RELEASE

04/08/2025



LEGEND	
PROPOSED LOT BOUNDARY	
PROPOSED ACCESS STORMWATER CULVERT	

0 0.5 1 1.5 2 2.5

Scale 1:50 (m)

FOR RC

VISION CONSULTING ENGINEERS

CLIENT: TAPUAETAHI INCORPORATION

PROJECT: TAPUAETAHI DEVELOPMENT
LOT 1 DP 184896
TAPUAETAHI

DRAWING TITLE: INTERNAL ACCESS STORMWATER PLAN

SURVEY		
DESIGN	CS	28/05/2025
DRAWN	CS	28/05/2025
CHECKED	BCP	03/06/2025
APPROVED	BCP	03/05/2025

No	REVISION	BY	DATE
A	FOR RC	BCP	03/06/2025

SCALE 1:1500
SHEET S1
PROJECT J15724
REV A

PROPOSED SUBDIVISION - TAPUAETAHI, NORTHLAND

ASSESSMENT OF LANDSCAPE, NATURAL CHARACTER AND VISUAL EFFECTS

LITTORALIS
LANDSCAPE ARCHITECTURE

1 INTRODUCTION AND METHODOLOGY

This report has been commissioned by Tapuaetahi Incorporation (the Incorporation) to inform a resource consent application to undertake a subdivision of its property situated at Taronui Road, Tapuaetahi, immediately inland of Tapuaetahi Beach and its small leasehold residential settlement.

The title is legally described as Lot 1 DP184896, (the Site), which forms part of a wider landholding owned by Tapuaetahi Incorporation that involves two further titles and a total area of 329ha. The extent of the incorporation's holding, including this 329ha, occupies a stretch of coastline running east from Tapuaetahi Creek and south to Purerua Road and beyond to Te Puna Inlet.

Set amidst this large holding, the Site has no immediate neighbours other than leaseholders of the Incorporation's residential titles along the toe of the coastal flank associated with Tapuaetahi Beach. The existence of a locked security barrier at the Purerua Road entrance to the private Taronui Road limits users of that road to those with an interest in the Incorporation, occupants of the leasehold residential sites at the beach, and their invited guests. Unfettered public access to Tapuaetahi is via a 3.7km foot track from Hewitt Road that is administered by the Department of Conservation, and by boat.

The Site lies within a Coastal Living Zone under the Operative Far North District Plan (OFNDP) and a Māori Purpose - Rural Zone under the Proposed Far North District Plan (PFNDC), including the residential leasehold land nearby.

The proposal is for a subdivision to create 20 residential lots and the development of a boat storage facility nearby and to the west of Taronui Road. It is assessed as being a non-complying activity under the OFNDP.

The Site lies entirely outside any Outstanding Natural Landscape as defined by the PFNDP and Regional Policy Statement for Northland (RPSN) and those identified by the OFNDP. PFNDP identifies the lagoon at the northwestern end of Tapuaetahi Beach as an Outstanding Landscape Feature, whilst the RPSN defines this "Taronui gravel barrier and lagoon" as an Outstanding Natural Feature in recognition of it being "possibly the best example in New Zealand of a coastal lagoon enclosed by a gravel barrier and margined by a white silica sand beach". Being low-lying at sea level and spatially disconnected, the lagoon is almost entirely divorced from the Site and activities upon it.

A comprehensive planning report which has been prepared by Bay of Islands Planning contains a full description of the proposal and includes detailed analysis against the OFNDP and PFNDP provisions and other relevant regulatory matters.

An equally detailed report prepared by Vision Consulting Engineers (the Site Suitability Report)[1] provides a description of the geology and physical characteristics of the Site and provides detailed commentary upon the proposal in geotechnical and engineering terms.

The assessment has been undertaken on the basis of the following methodology:

[1] Vision Consulting Engineers (9 March 2026) *Site Suitability Report – Tapuaetahi Development*

- Review background documents that inform an understanding of the Site and wider setting in terms of both physical characteristics and the regulatory framework.
- Undertake a walkover of the Site and visit immediately adjacent, accessible land-based areas that have a view to the Site, along with the waters associated with Tapuaetahi Beach out to the mouth of the Bay as defined by headlands to the east and west.
- Photograph the Site – where visible – from these various locations and assemble the resulting images into accompanying attachments. Vantage-points were selected to capture the greatest exposure or "worst case" view from each locale.
- Describe and analyse the biophysical and land use characteristics of the Site.
- Broadly categorise the Site context based upon areas of contiguous landscape character, with these areas being frequently determined by land use as the primary determinant.
- Assess the relationship between the Site and the various viewing audience groupings that are potentially affected by the proposal in order to report upon visual effects.
- Assess landscape effects in relation to the form of the proposal and its compatibility or otherwise with established characteristics, patterns and general structure of both the Site and its wider context.
- Identify and quantify natural character effects that may be imposed upon adjacent areas of coast or waterbody.
- Provide some summarising conclusions that draw together the main body of findings.

SECTION A: DESCRIPTION OF THE SITE

The oblique aerial images found in Attachment One, alongside the Site photographs of Attachment Three, illustrates Site in relation to its wider setting. These images highlight the way that the Site occupies land that lies well above the existing Tapuaetahi settlement in elevation terms as a result of a steep intervening flank but that there is a close proximity to that existing development when seen in vertical plan form.

Since the full extent of the application site vaults Taronui Road to include the proposed boat storage facility – which has its own characteristics – the following descriptions will differentiate between the intended subdivision and storage facility parts of the land.

2 EXISTING PHYSICAL CHARACTERISTICS

2.1 Geology and soils

Section 5.1 of the Vision's Site Suitability Report references the Waipapa Group and Kerikeri Volcanic Group origins underlying the Site.

It also described a range of soil types have been recorded, traversing gravelly, friable material that is well drained through to clay and silty clay soils that have much more impeded drainage characteristics. Those diverse soil morphologies are somewhat reflected in variable ground conditions expressed on the Site.

2.2 Landform

Close inspection of contour lines underlying the Integration Concept contained in Attachment Four and the photographs of Attachment Four (particularly VP13-18) provides a useful insight into the morphology of the Site. Figure 5 of the Site

Suitability Report is a further helpful resource, with its coloured shading, particularly graphic contours and annotations describing gradients.

The highest, southern, part of the subdivision Site lies as something of plateau belt alongside Taronui Road at an elevation of approximately 52.5m RL. From this most elevated part, the land drops quite steeply to the north to an area of lower, predominantly gentle terrain that is punctuated by a minor knoll in its midst. That gently sloping land ranges from 34-38m RL and is experienced as something of an elongated basin, best represented by VP19. Contributing to that basin-like character is the way that defining steeper land associated with the ridge that crests the coastal flank on the western edge of the subdivision Site swings north to create a measure of enclosure.

On the eastern edge of the subdivision Site the land drops sharply from the plateau to lower farmland, as illustrated by VP13. Further down, the lower lying part of the site transitions to the rolling slopes of the shallow valley that continues southeast through the body of the farm, as most readily seen in VP14.

Collectively, this rather complex, and in parts fragile, topography has considerably informed the way that the subdivision proposal has been configured, particularly in relation to building placement and the alignment of road access corridors.

A highlighting arrow on VP13 and VP14 illustrates how the topography of the proposed storage facility site rises gradually above Taronui Road to currently be approximately 2.5m above the level of the closest point on the road (and where the future access is positioned). In this position, the storage facility site lies near the head of a steep, forested catchment head that drains to Tapuaetahi Creek.

2.3 Hydrology

Neither part of the Site has any notable hydrological features. There are a few seasonally damp areas on the proposed subdivision Site, but the land associated with the application is generally well drained and free of even ephemeral watercourses. There are two overland flow paths that are marked by a slight depression in the ground profile as they exit the Site and these are thought to only run briefly after heavy rainfall. Those overland flow routes are marked on Figure 8 of the Site Suitability Report.

The subdivision site falls within the catchment of Waiotia Stream, whilst the storage facility area contributes to the Tapuaetahi Creek watershed.

2.4 Vegetation

As the photographs of the Site found in Attachment Three (VP15, 17-20) reveal, the Site is almost entirely clear of any existing vegetation other than the grass sward of typical grazed paddocks. There is a small, stunted totara (*Podocarpus totara*) in the midst of the Site, and a second similar specimen a little to the southeast, where it is accompanied by a pair of equally impoverished kanuka (*Kunzea ericoides*). These are visible in the midst of VP18. A further flimsy kanuka sits near the eastern fenceline (hard right in VP17). A small segment of low native vegetation set around a large pohutukawa marks the point where an incised overland flow path enters the northern apex of the subdivision Site, as seen near the marker for VP20 on Attachment Two B.

The storage facility site is devoid of vegetation other than pasture.

Whilst the two parts of the Site are almost entirely grassland, that grazed extent is strongly defined by predominantly native vegetation that lies immediately beyond

fencelines. For the subdivision site, this exists as a very narrow belt of manuka and kanuka alongside Taronui Road, the coastal flank vegetation (including a proportion of exotic weeds) along the seaward face, and the more extensive pattern associated with Waiotia Stream to the northeast.

On the western edge of the storage facility is an area of established forest that forms part of a wider system that is associated with the Tapuaetahi Creek and extends a considerable distance to the south, almost reaching Kerei Mangonui (Te Puna) Inlet.

2.5 Land use

The subdivision Site is free of existing built development other than a recently installed tsunami siren placed alongside Taronui Road on its western boundary and identified on the Overall and Detailed Site Plans of Attachment Four. All the area proposed for development, including the storage facility, exists as pastoral farmland which has been largely managed for grazing for over 75 years (other than a period around 1980 when it was partially recolonised with manuka/kanuka), with typical wire fencing and minor access present to support that use.

SECTION B: CHARACTERISATION OF SETTING

3 DEFINING ELEMENTS / LANDSCAPE CHARACTER AREAS

The wider structure of Tapuaetahi hinterland can be categorised into a series of defining elements and landscape character areas. In general, these tend to be largely determined by relationships between housing and terrain, the influence of the coast and extensive forest/shrubland areas that exist in the context of the Site. Reference to the panoramic photographs contained in Attachment will usefully inform reading of the following descriptions. The position of those photographing points is set out on two sheets forming Attachment Two, with the first of those covering the wider vantage points and the second to those set within the Site. Their distribution largely indicates where the Site is "publicly" visible from.

3.1 Tapuaetahi leasehold residential area

The photograph underlying the Overall Site Plan and Attachment Two A illustrates the way that houses have been developed in the narrow strip of land between the toe of the coastal flank on the northern edge of the Site and the shoreline, including the outer estuarine margin associated with Tapuaetahi Creek.

Panoramas VP07-VP09 provide a sense of these low-lying buildings and their contribution to the informal, seaside character of the settlement. Whilst many are modest, typical bach structures, there is a detectable shift towards much larger homes of more imposing scale replacing original dwellings in this western and central part of the village, or extensions that expand the early structures.

Photograph 1: The central segment of the existing shoreline housing strip, with the coastal flank that ascends to the Site immediately behind acting as a robust and cohesive backdrop.

Most of the buildings in the eastern part of the settlement, which ascends the hill and headland at the eastern end of the beach, have been built since the 1980s.

Although largely newer than the balance of the leasehold residential area, these eastern buildings are predominantly larger and frequently two storied. Despite their volume, architectural diversity, and greater elevation, these houses are surprisingly well integrated due to the extensive amenity planting and more mature pohutukawa that exist in this headland enclave.

Photograph 2: The eastern part of the settlement that is associated with that end of the beach and related headland. Houses here are typically larger but relatively well integrated amongst developing planting.

4.2 Rolling, grazed farmland

As part of an extensive grazing property, much of the terrain between Purerua Road and Tapuaetahi Beach is developed and managed as pasture that is consistent with land use running out to the tip of Purerua peninsula. It is commonly interspersed with considerable blocks of native shrubland, typically related to the catchments of small watercourses that drain from the elevated centre of the landform out to the coast and described in the following segment.

Photograph 3: An inland view across the currently pastoral use of the Site, with the continuing grazed grassland of Tapuaetahi Incorporation's farmland seen stretching on to the east in the left side of the image.

Land to the west of Tapuaetahi Creek is similarly open and grazed but less topographically diverse. Large vegetation around the eastern fringes of those pastoral areas largely divorces it from Tapuaetahi.

4.3 Shrubland tracts and belts associated with stream catchments

As the defining and dividing elements that split the grazed farmland just outlined, these vegetative patterns reflect the core catchment elements and add considerable legibility to the landscape of the area. They also perform valuable services in ecological / habitat terms and contribute to elevating freshwater quality.

The Site lies conveniently between two of these tracts (being associated with the Waiotia Stream and Tapuaetahi Creek respectively), offering the opportunity - that

the proposal has captured to provide a further compartment that ties together those broad vegetative sweeps that run inland.

Photograph 4: Looking over the barrier spit at the western end of Tapuaetahi Beach towards the small, forested hillsides associated with Tapuaetahi Creek.

Photograph 5: The shrubland cladding the eastern face of the valley associated with Waiotia Stream, seen just inland of the Site.

Photograph 6: Looking down over the barrier spit and lagoon mouth where Tapuaetahi Creek exits to the sea, as seen from the northwestern brink of the Site. Note large vegetation on land beyond the mouth of the creek that is referred to in section 4.2.

Inspection of aerial images reveals that the Incorporation's holdings feature much more generous belts of catchment-related vegetation than the formerly barren farmland that extends out along Purerua Peninsula. There, a considerable investment in riparian protection and restoration by the developers of Mataka and Wiroa Stations, and Mountain Landing, is becoming clearly expressed but not generally with the same spatial generosity.

4.4 Coastal sequence of bays and rocky headlands/reefs

A defining feature of the wide coastal setting that Tapuaetahi sits within is a repeated pattern of small headlands, shallow, scalloped beaches and widespread reefs and platforms. That theme runs west to the more substantial Takou Bay and east to Cape Wiwiki at the tip of Purerua Peninsula.

Whilst sharing these coastal elements, Tapuaetahi is distinct in being a larger beach, incorporating the lagoon (Te kupenga o Kupe) and integrally related to the broad estuarine mouth of Tapuaetahi Creek,

Photograph 7: A view across the bay towards the lagoon and nearby headland that contain the western side of the bay. The pattern of beaches and defining headlands can be seen continuing up the coast toward Matauri Bay in the background.

Photograph 8: The small bay immediately to the east of Tapuaetahi. This is a popular seasonal camping ground amongst the Incorporation's shareholders and their whanau. The headland and its fringing reef are a consistent element along the wider portion of coast.

SECTION C: DESCRIPTION OF PROPOSAL

Prior segments have analysed the Site and its context as a setting for the proposed subdivision. An important context to this section is the Incorporation's role in the proposal and the distinct, socially inspired motivation for undertaking the proposal. As the representative body of many Māori owners and their considerable whanau, the Incorporation owns the land involved in the proposal and a substantial extent around the Site. The Incorporation's purpose in creating the subdivision and storage facilities is not to directly cater for its beneficiaries' personal housing needs but to provide long term revenue that supports the Incorporation's aspirations at a wider scale. The Incorporation intends to retain the ownership of created titles and to generate a return through leasing of those lots, as it does with the existing coastline leases nearby.

The application is to subdivide the main body of the Site into 20 residential lots, and to provide for the hard stand, buildings and related infrastructure of a storage yard on the opposing, western, side of Taronui Road. The residential subdivision is contained within the extent of the Coastal Living zoned land, with lots that are larger than 600m^2. Sites would be served with underground power and secondary wastewater services (with initial, primary treatment occurring on each lot).

Whilst not formally a Management Plan subdivision under section 13.9.2 of the OFNDP, the proposal has been formulated in a manner that is consistent with the ethos of the Management Plan provisions, being responsive to the natural and cultural characteristics of the Site and applying an integrated, innovative approach to its design.

Attachment Four contains an Overall Site Plan that is followed by a pair of more detailed Site Plans that provide a larger scale view of the proposal, with a greater

level of annotation. These are supported by a suite of drawings contained in the Site Suitability Report that convey further detail on the engineering works required to realise the proposal.

A primary formed road would enter the subdivision Site from just to the west of the tsunami siren mast through a security gate. A minor access would depart the main road soon after, running east along the southern edge of the upper plateau to cater for Lots 7 to 10 inclusive. The primary road would then sweep down around the contour to the toe of the main flank that splits the elevation of the Site, connecting with proposed Lots 1 to 6 and 11, as it descends. At that point, a shared access would run north to serve proposed Lots 12, 13 and 14. The road would continue to arc east, providing access to the secondary wastewater treatment plant and lots15 to 20 inclusive.
Roadside swales and a stormwater retention pond would address surface stormwater, and these infrastructural elements have been incorporated into the intended landscape treatment and management of the Site, as conveyed within Attachment Four. The margins of these management elements would be planted with appropriate indigenous species. The stormwater pond would lie in a discrete, low-lying position on the inner margin of the Site, where proposed planting of all but the dam face would merge the small waterbody with the adjacent landform.

Allotments are configured around defined building locations. Those positions have been informed by a desire to limit necessary earthworks, minimise external landscape and visual amenity effects, avoid geotechnically challenging areas (primarily steep slopes and the crest of some flanks) and optimise the amenity offered within the project.

Controls over building positions, height and finishes are proposed. The Site Plan identifies building areas. A majority of building heights are proposed to be limited to 5m above finished ground level (with the intention that creating that level would see platforms being largely cut down into natural ground as distinct from being built up on a significant thickness of fill).

The levels and adjusted contours shown in the Site Suitability Report and the Site Plans in the attachments to this report, are intended to be indicative, with final resolution emerging from detailed design of those platforms (which would consider vehicle parking and manoeuvring, connected outdoor living spaces, etc). It is recommended that the platforms for the more visually sensitive Lots 13 and 14, in particular, be set as close to the lowest part of the underlying natural terrain as is practicable through that detailed design process.

To further limit the modest potential visual amenity effects of future homes, it is also intended that a 20% light reflectance value (LRV) limit be placed upon the roofs of any buildings on proposed Lots 1-10, 12-14 and 16. The cladding of those structures is proposed to have an LRV limit of 30%. Applied surface colours should fall within greyness groups A, B and C under the BS5252 colour palette.

An additional aspect of the arrangement of the proposal is its strategy to mesh the development elements with the broader landscape patterns that surround the Site. A key component of that strategy is to create a vegetative bridge (and visual backdrop) that links the substantial belt of native shrubland associated with Waiotia Stream to the north with that in the catchment of Tapuaetahi Stream to the south. Extending that southern valley-head vegetation would also form a framework and visual containment to the proposed storage facility. This corridor is likely to also have some value as an ecological connection for birdlife.

A further structural belt of planting would create a spatial and visual buffer alongside Taronui Road, where it would supplement the narrow fringe of indigenous vegetation that exists along much of the roadside to the subdivision Site.

Sitting within this bold pattern, proposed Internal vegetation within subdivision would provide a second tier of backdrop and buffering, whilst also serving to contribute to the amenity value within the Site. As the key to the Site Plan sets out, this vegetation would be comprehensive across the majority of the Site that isn't occupied by buildings or access corridors and be composed predominantly of locally common native species within several tiers of height.

Fire management will be an important influence when selecting those species, as they will serve as a potential buffer to the spread of fire that could run through the manuka and kanuka-dominant shrublands occupying the Waiotia and Tapuaetahi catchments to either side. To perform this role, species that are more mesic and less flammable would be favoured in any planting within 20m of a building area.

In recognition of the specific ecological context of the Site and the detailed functional requirements of vegetation (including fire management and stormwater control), it is recommended that detailed documentation for all planting and its ongoing management be a required element of a potential consent. Perpetual retention of planting and provision for replacement of significant plant losses that are either concentrated in one area, exceed 10% of overall plant numbers or constitute a specimen tree, will also be required to ensure that the proposal provides for the outcomes anticipated by this report into the future. An exception to perpetual retention of planting is the stormwater wetland, where a regime of management for its inlet, outlet and maintenance of capacity may be required.

The management of the vegetation on individual Lots will be the responsibility of each of the future leaseholders.

A walkway down to the beach and small boat storage building at the toe of the coastal flank are a minor amenity that is also proposed for residents of the proposed subdivision.

The principles that have just been outlined for the subdivision part of the Site are also intended to apply to the storage facility. As the Site Plan notes, a planted bund up to 3m in height will serve to block views down the compound from Taronui Road. That bund height will reduce near the entrance to the compound where there is limited space available. Since the road is more proximate and at a similar level to the compound at that point, the mound need only be 1-1.5m high to perform the same visual screening role. The dense planting envisaged will combine with the mound to block views – other that through the access entry – within a year of installation. A 20% LRV limit should apply to any buildings within the compound and security fencing subject to the same controls unless encapsulated within vegetation relative to the exterior of that part of the Site.

The management of the vegetation on each individual Lot will be the responsibility of each of the future leaseholders.

It is intended that the development will be created in six phases, as illustrated by the Staging Plan contained in Attachment Four. Each stage would involve the creation of the relevant portion of access, building platform creation and indicated planting.

It is noteworthy that the structural frame of native planting to the southern and western margins of subdivision part of the Site would be installed as part of Stage 1,

ensuring that the planting is established by the time that Stage 2 – which would most fully benefit from the integrative role of that vegetation – is initiated. On a related note, the latter stages of development are likely to also be influenced by the continuing growth of natural vegetation on the coastal flank and Waiotia Stream valley crest.

SECTION D: EFFECTS ASSESSENT

Preceding sections describe the characteristics of the Site and its setting. These are followed by a description of the anticipated development of the Site and its component parts. The purpose of *this* section of the report is to define the effects of the proposal upon the setting, to consider how the proposal would impact upon the experience of people viewing development that would result from the plan change from outside of the site, and to comment upon the resulting level of effect upon landscape character, visual amenity and natural character.

Adverse effects impact negatively on the landscape and result in landscape, natural character and/or visual amenity values being diminished. ***Benign* or *neutral effects*** are those in which a proposed change neither degrades nor enhances these values when considered in the whole. In circumstances where ***positive effects*** arise from a development, the changes that have been brought are deemed to be beneficial relative to the landscape state of the site prior to that change.

Effect ratings that will be used:

Very high: resulting in a dramatic or total loss of the defining landscape characteristics of the site/context, or visual amenity associated with that setting.

High: leading to a major change in the characteristics site or setting, or significantly diminishing key attributes, and/or comparable impacts upon visual amenity.

Moderate – high: an interim measure of effect in which impact of the development results in a change of some significance to the qualities or perception subject landscape.

Moderate: a self-explanatory magnitude in which effects sit midway between the extremes this spectrum of magnitude. Can also be considered as an "average" level.

Moderate – low: impacts on landscape characteristics and attributes are relatively contained. The threshold defining "minor" in relation to the S104D gateway test sits within this level of magnitude, typically towards the lower end of its spectrum.

Low: effects are generally very limited and do not result in compromising the characteristics of a landscape or perceptions of it in a more than subtle way.

Very low: negligible or imperceptible effects result upon the landscape and/ or perceptions of it.

7 VISUAL AMENITY EFFECTS

Viewing audiences / affected parties

To assist with predicting the level of visual and landscape effect that the proposal would generate, "publicly"* accessible vantage points in the area were selected to be broadly representative of each of the following identified audience groups, selecting worst-case views wherever possible. Panoramic photographs for each vantage point are found in Attachment Two. These will be referred to in the following commentary.

The degree of adverse visual / landscape effect generated by a proposed change or development depends upon the character of the surrounding landscape (the context), existing levels of development on or near an application site, the contour of the land, the presence or absence of screening and/or backdrop vegetation, and the characteristics of the proposed development.
The role of the heavily vegetated coastal flank that descends to the shoreline, the relatively flattened profile of the Site above that steep coastal terrain, orientation of slopes within the subdivision part of the Site, and the limited accessibility of the land surrounding the Site and coast are all influential.

A 9m high tsunami siren mast installed alongside Taronui Road on the highest land found on the southern margin subdivision Site serves as a useful gauge of location and height relative to 5m houses that would be provided for on related proposed Lots 1-10. Interestingly, that siren mast is only visible in views from the north/northeast (represented by panoramic photographs VP02-04, VP10-11) and approaching seaward on Taronui Road (VP13-14).

Users of the Coastal Marine Area (CMA) associated with Tapuaetahi

Panoramas VP16 (taken from beyond the Site) and 17-21 provide a sense of the seaward outlook from within the subdivision Site and the way that the terrain and vegetation on the crest of the coastal flank primarily limit the outlook to being across the lowest land associated with proposed Lots 16 and 17. Those seaward views are primarily framed to be towards the distant Cavalli Islands and the intervening body of CMA that commences approximately 1.5km offshore. The seaward views give a clear sense of the "visual catchment" of the Site and the landward views from out on the sea.

Future buildings on proposed Lots 12, 13 and 14 (Stages 3, 4 and 5) are potentially most exposed to view from the CMA, with a slender scope for a building on Lots 2 and 3 (Stage 1) having some potential for viewing from the outer part of the lagoon (VP01). In each case, it would be the upper portions of these single storied structures that have some potential to be witnessed from the CMA, with that visibility being considerably constrained by the finish controls, flank vegetation and intended planting within the Site that would act as a backdrop and to punctuate the skyline.

Tapuaetahi is a considerable distance from the many all-tide public boat ramps within the Bay of Islands/Kerikeri Inlet (Opito Bay being closest) and Whangaroa, which substantially limits trailer boat visitors from the south. Beach launching at Matauri Bay is less user-friendly and that restricts the number of potential users. Tapuaetahi is also some way from Matauri Bay. Whangaroa provides the first high standard of launching facility to the north and that is approximately 35km away. Whilst sheltered

* a term used advisedly in light of the Incorporation's ownership of surrounding land and Taronui Road, making those terrestrial areas essentially restricted to private access only and a correspondingly limited audience

from the east, the Bay is exposed to the north and coastal swells generally, which makes it less attractive than more protected anchorages at the Cavalli Island group and Bay of Islands and limits its use by larger vessels.

The primary boating audience is composed of those who hold the leases at the coastal settlement, their visitors and the beneficiaries of the Incorporation. When compared with popular public ramps in the Bay of Islands or Whangaroa Harbour, their number is small, estimated at a dozen or so boats on a busy summer day according to local sources.

The channel to the east of the central reef, marked by Panoramas VP03-06, is relatively shallow and prone to breaking waves. The wider area to the west of the reef is deeper and understood to be the generally preferred route out to sea from the beach. This track provides less exposure to the Site than the eastern side of the reef and it is only when returning to shore that boat passengers will generally look landward.

It will largely be only fragments of houses on proposed Lots 2, 3 and 12, 13 and 14 that will be visible from the inner CMA (out as far as VP01-03) and witnessed in the background of the substantially more prominent existing settlement. The area where the greatest exposure will occur is on the line represented by VP03 and VP05, where the low point associated with proposed Lots 13 and 14 opens the inner Site, including the plateau near Taronui Road to greater view. This occurs in the immediate context of housing at the eastern end of the coastal flank and the eastern headland, bringing a sense of association and continuation of an established pattern.

Generally, a larger proportion of structures will become exposed in more distant views from further out to sea, particularly from the line of the centre of the Bay and further east, where the screening role of the coastal flank progressively diminishes through the geometry of the viewing angle. These more distant views will come with a lesser degree of clarity and definition and continue to be conditioned by the established housing development associated with the shoreline and eastern headland.

When these various influences are factored into a comprehensive consideration of potential visual amenity effects experienced from boats, the level of adverse impact is assessed as being *low* and less than minor.

Swimmers and surfers make up the main user group of the inner CMA. Swimmers are likely to be almost entirely confined to the inner waters of the bay, closer to shore than VP06 on Attachment Two A. As that image illustrates, the intervening coastal flank serves to block views to the subdivision Site and it is unlikely that swimmers would be able to see even the peaks of potential future house roofs. In this light, the adverse visual amenity effect upon this group is deemed to be *very low*, at most.

Surfers on the central reef will be picking up waves between the line of VP06 and possibly as far out as VP04. Their surfing position would be around 30-50m to the west of where those images are captured from. The outer portion of this range would provide for potential visibility of the upper portion of buildings on proposed Lots 13 and 14 (Stages 4 and 5), set against the midground context of the existing shoreline housing below. From the inner part of the reef – represented by VP05 and VP06 – it is unlikely that future buildings on the Site will be visible. The visual amenity effect of the proposal upon this audience is assessed as being *very low* and less than minor.

Users of Tapuaetahi Beach

The majority of the beach lies quite close to the base of the forested coastal flank that defines the edge of the Site. That flank and its vegetation serve to block views to the Site due to the cross-sectional profile of the beach, backshore, flank and flattening land of the Site that can be seen when inspecting VP10. Panoramas VP08 and 09 illustrate this relationship as experienced from the eastern end of the beach, with the Site entirely concealed.

It is not until reaching the western end of the beach, near the tip of the barrier spit (and nearby VP07) that greater distance from the flank allows the potential to see a portion of the upper parts of a future single storied building on proposed Lot 2. Panorama VP16 was taken from some distance to the west of the defined building area on that lot (see Attachment Two B) and therefore overplays the possible degree of exposure. Intended planting seen on Detailed Site Plan 1, would serve to largely or entirely mitigate potential visibility from the western end of the beach.
The beach associated with the lagoon is almost entirely blocked from views in the direction of the Site by its southeastern headland.

The visual amenity effect of the proposal upon beach users is assessed as *very low* and less than minor.

Residents of Tapuaetahi settlement

All of the houses most closely associated with the beach lie in the lee of the coastal flank and are visually disconnected from the Site as a result (see VP07-10). Homes that lie on the gentler slope between Taronui Road, where it descends to the beach, and the western end of the Site are also blocked from views to the Site by intervening vegetation and the rising slope.

It is largely 4 homes that are positioned above Taronui Road (being no.'s 62, 64, 66 and 68) on the spur rising from the very minor headland that defines the eastern end of the inner bay that are potentially affected by the proposal. They lie across the valley carrying the Waiotia Stream from the Site and are therefore influenced by the developing native vegetation of that landform in their views to the south. A further house (NO. 38) that is positioned up on the coastal flank near the northwest corner of the Site is also exposed to the majority of the body of the subdivision Site.

Those more eastern houses can be seen in Panorama VP10, which was taken from farmland beyond the settlement and looks back across the potentially affected properties at the end of toward the Site. Panorama VP18 is also informative, showing the way that this cluster relates to the Site and how the orientation of the Site's terrain reveals most of the proposed building areas to view from those houses. Photograph 9, below, is an enlarged part of one of the photographs that make up VP18 and the position of the potentially affected homes is described in its caption.

Close inspection of Photograph 9 reveals that most of the buildings have favoured a sea view and northerly aspect when positioning living areas and large areas of glazing, with those windows on the southeast and southwest facades facing the Site appearing to be predominantly high and small, suggesting that most are service rooms. A few larger windows on these faces indicate the likely presence of bedrooms.

Photograph 9: An enlargement of one of the photographic frames that comprise VP18, highlighting the 4 houses at the end of Taronui Road to right and the residence below the northwest apex of the Site to hard left (alongside a second, lower, Norfolk Island pine)

The vegetation associated with the upper brink of the coastal flank and that of the western brink of the Waiotia Stream valley is young and largely of limited scale. Those plants will continue to gain stature and, over 5-10 years, will reach a height of 5-8m to block the closest potential future houses on proposed Lots 13, 14 and 18 (noting that these are in Stages 4 and 5, leaving the likelihood of the buildings being constructed some years after the project commences). The core of the Site is proposed to be heavily planted around proposed Lots 12,15, 16 and 17, which would provide a second tier of buffering to adjacent future buildings, whilst proposed vegetation along the western edge of the upper plateau would create a backdrop to buildings on proposed Lots 1, 2 and 7-10

Acknowledging that primary views from these 5 nearby properties are seaward and noting the intended staging of the proposal over several years, the initial level of adverse visual amenity effect upon occupants will initially, be *moderate-low* and minor. This initial magnitude is related to the effects of housing in Stages 1 and 2 being constructed in relatively close succession, along with related backdrop and allotment planting establishing. Medium-term effects will subject to the timing of the further stages and their related planting. If those were to occur in rapid succession and before installed vegetation (and natural vegetation on the Waiotia valley margin) is able to develop the scale and robust pattern that is intended, there may be a period when effects reach a *moderate* level. Having been made aware of that potential, the Incorporation has committed to delaying the construction of buildings on proposed Lots 13 and 14 until after 2031. This delayed timing will ensure that effects on this audience will be limited to moderate-low, and less than minor. After a 10-year duration it is probable that kanuka on the northern edge of the intervening valley will reach a height where it blocks views to the Site from these eastern homes.

Motorists and walkers on Taronui Road

The sealed, private, Taronui Road serves the seaside settlement and provides access to the Incorporation's land. It began service as a farm race (and is still officially categorised as such) and was sealed and named to provide a better level of service to leases. Public traffic is excluded by a locked barrier at Purerua Road, which considerably limits the volume of cars using the road and limits users to those who have a connection to the leasehold properties or the Incorporation. Some people are known to take recreational walks along the road from the settlement.

A fringe of manuka/kanuka lines the road fence line associated with the proposed subdivision fenceline, as seen in Panoramas VP12, VP13 and Attachment Two B. A small portion of that low vegetation will need to be removed to provide for sight lines from the subdivision entry.

Both sides of the Site are exposed, primarily, to views from vehicles travelling towards the beach and settlement, with Panoramas VP13 and VP14 representing views across the open farmland that runs inland of the Site. At present, the storage facility site is fully exposed, whilst much of the subdivision site lies concealed beyond the combination of the steep slope dropping from the southern edge of the upper plateau and an adjacent spur that tracks downslope

A broad planting belt to the southwestern and southeastern edges of the subdivision site will be installed as part of Stage 1 (the pocket of 3 lots in the western corner of the Site. As it will only be future houses on proposed Lots 9 and 10 that would be seen from the southern part of Taronui Road, it is likely that the framework planting will be well advanced toward creating an effective screen to those lots by the time that houses are constructed. That same belt of planting would rapidly supplement existing roadside vegetation to provide a solid blockage to perpendicular views from the road to buildings on proposed Lots 1, 7-10.

The visual amenity effects of the subdivision part of the proposal are accordingly assessed as being initially *low* (at most) and diminishing to very low once planting achieves canopy closure and a >2m height 2-3 years after installation. The planting will continue to grow to a 10m+ height over the following 10-15 years.

The storage facility is less readily integrated in relation to views down Taronui Road and the proposal recognises that challenge in its formulation. Cutting the platform into the terrain and forming a broad mound in the order of 3m high on the road side of that platform (where space allows), will provide an immediate measure of containment to the structures involved. A substantial cover of planting would then wrap over that mound, along the roadside interface and around the northwestern background to almost completely encapsulate the compound.

Initially, the effects of the facility upon the road audience would be of a moderate low level, being at the lower end of that spectrum and therefore less than minor. Within two years, the planting will have achieved a scale where buildings are screened and the impact will reduce to a *low* level. After 3-4 years the vegetation will have created a solid canopy that will read as an extension of the natural cover of the adjacent catchment head and effects will diminish further to *very low*.

Those occupying farmland to the west of Tapuaetahi Creek

The terrain to the west of Tapuaetahi Creek can be seen in several of the Panoramas and most particularly in VPs 10, 12 and 16, and to lower left on Attachment Two A. This area is accessed from the lightly used Hewitt Road and includes access for walkers to the Taronui Bay Recreation Reserve Track. There are less than a handful of houses in this area, the two most recent of which supersede the aerial image of Attachment Two.

The substantial belts of vegetation found on that western side of the Creek largely block views back towards Tapuaetahi from these homes. The home seen bottom centre in Attachment Two A would have views toward the subdivision site broken by the established vegetation on the slope dropping from the southwestern edge of proposed Lot 2. Adverse visual amenity effects upon this audience are deemed to be *very low*, at most.

8 LANDSCAPE EFFECTS

Landscape effects are those impacts upon the structure, pattern and character of landscape that result from a development or change in land use. In the case of this proposal, the nature of the Site and its context are influential in determining the

magnitude of landscape effects arising from the building and related site development / enhancement that would flow on from a subdivision consent.

As the two oblique views in Attachment One and the various attachments illustrate, the Site lies on the spatial interface between the long established settlement associated with Tapuaetahi and the expanse of rural land that stretches southeast toward Te Tii village.

The Site is also informed by the belts of native vegetation that frame the Taronui Road spur as they mark the courses of the Waiotia Stream and much larger Tapuaetahi Creek. Topography further influences the landscape of the Site, particularly the subdivision site. Whilst elevated, the undulating terrain forms something of a basin over much of that area and the plateau part of the Site terminates in a sharp slope that separates it from the rolling contour that then continues up to Purerua Road.

This landscape morphology and setting offer strong cues for effective integration of change and a framework to build from in relating the proposed development area more resolutely to the existing settlement at the beach than to the open farmland and shrubland swathes that run inland. In recognising that scope when defining locations for potential future buildings and when formulating a vegetative setting for the Site, the proposal has sought to minimise potential landscape effects.

In now standing back to consider whether that strategy would be effective, it is assessed that landscape effects would initially be of a moderate-low level, reducing to a low level within 5 years (at most) of framework planting being installed and by then fully achieving the bold pattern needed to be experienced as a seamless projection of the broader natural vegetative pattern.

9 NATURAL CHARACTER EFFECTS

Section 6(a) of the Resource Management Act (1991) states that the following matter of national importance shall be recognised and provided for:

"The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins and the protection of them from inappropriate subdivision, use and development."

A working definition of natural character is derived from research undertaken for the Ministry of the Environment in relation to Environmental Performance Indicators (Boffa Miskell Ltd 2002). This states that:

"*The degree or level of natural character within an area depends on the extent to which natural elements, patterns and processes occur; and the nature and extent of modifications to the ecosystems and landscape / seascape. The highest degree of natural character (greatest naturalness) occurs where there is least modification. The effect of different types of modification upon the natural character of an area varies with the context and may be perceived differently by different parts of the community."*

As the preceding extract indicates, natural character exists on a continuum that spans from totally modified at one extreme, to entirely natural at the other. The OFNDP and Regional Policy Statement for Northland (RPSN) identifies several areas of high natural character relating to coastal margins and forested valleys on the Incorporation's wider holdings and other land running west toward Takou Bay. Predictably, these primarily relate to areas that are least developed and their distribution reflects the heightened natural character attributes of the wider context of Tapuaetahi.

The vegetative patterns associated with Waiotia Stream (HNC 246) and Tapuaetahi Creek (HNC 248) are those most closely related to the Site that have been identified as having High Natural Character. The shrubland-clad catchment arm leading up to the proposed storage facility and the coastal flank between the settlement and the subdivision site are excluded from natural character recognition. The body of the Site itself, with its pastoral use, is excluded too.

Since the Creek HNC area is divorced from the Site, the following commentary will address only HNC 246 in relation to identified natural character. Key characteristics and values recorded for that area are:

Summary Description	*Gully heading inland from eastern end of settlement. Primarily kanuka dominant shrubland & forest with some mixed broadleaved forest in the base of the lower valleys*
Contributing Values	*Largely indigenous vegetation with few pest plants. Minimal human-mediated hydrological or landform change. Few obvious human structures. Part of community pest control area.*

This natural character area is largely deflated as it passes the Site and approaches the coast. Its associative relationship with "the natural character of the coastal environment" is therefore less pronounced than more elevated terrain or belts of coastal margin that have heightened value. The topographic nature of the Site, as described previously, is not unduly dominant over the HNC valley, with the contour associated with the nearest Lots 13, 14 and 18 gently rolling off from the crest of the valley wall. As such, they have very limited capacity to unduly impact the any perceptual or associative values related to this northern part of HNC area 246. Proposed planting on the margin of the HNC will provide a very minor supplement to its values and assist to buffer any small impact by the proposal.

Whilst the enframing coast of the outer bay associated with Tapuaetahi contains several HNC areas, the inner bay is notably devoid of such recognition, despite its central and fringing reefs, barrier spit environment and fringing pohutukawa on the eastern headland. This is because the built development of the settlement, roading, coastal armouring and considerable population of invasive exotic plants serve to compromise natural character values (as indicated by the italicised quotation at the beginning of this section). Other than its somewhat limited relationship with the Waiotia valley, the subdivision site is primarily related to Tapuaetahi Bay and the modified nature of that portion of coast.

When these influences are balanced, it is considered that the resulting level of natural character effects of the proposal would be at a *low* level and less than minor.

SECTION E: CONCLUSIONS

The proposal is founded upon a social endeavour by Tapuaetahi Incorporation and is distinctive in that regard and because the incorporation owns the land that surrounds the Site, as well as the legal access to the immediately adjacent existing area of leasehold housing. In this context, the Site lies on the threshold between the residential influence of Tapuaetahi settlement and the expansive area of farmland and vegetated watercourse valleys that stretch off to the south through toward Te Tii settlement. In that position it lies on the outer margin of an area of HNC under the RPSN and PFNDP.

The proposal has been configured around existing areas of pasture and the margin of the main body of the Incorporation's farming operation. It has also been resolved through an integrated effort to conserve the most intact and diverse areas of native

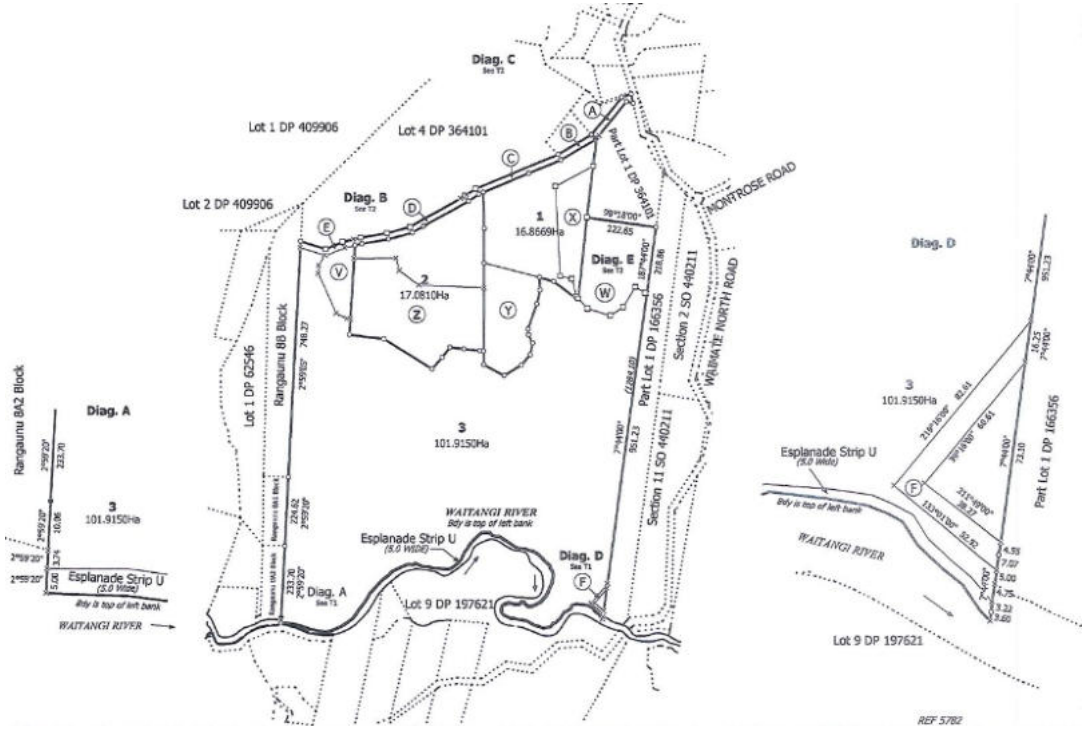
vegetation and to then unify the resulting pattern through restoration planting. Further indigenous planting is proposed to assertively address the potential impact of roading and retaining, strengthening the wider integration still more fully.

Whilst acknowledging that visual exposure of the Site is relatively limited, management of building characteristics and the creation of a comprehensive framework of indigenous vegetation through a combination of conditions of consent and registered consent notices is expected to ensure that structures and roading will achieve a sympathetic fit with the Site and its wider setting. These measures would serve the amenity of future residents of the proposed subdivision as well as potentially affected viewing audiences.

When balancing the impact of the proposed subdivision against initiatives for ecological management and restoration, landscape and natural character effects upon those values are assessed as ultimately being less than minor. The actual magnitude of those effects (up to that defined level) will be influenced by the programme for the intended staged development of the subdivision – which are partially dependent upon market and financial influences that can't currently be accurately predicted – with a longer period between implementing each stage serving to reduce that level of effect.

Mike Farrow **Principal landscape architect** **March 2026**

Tapuaetahi Incorporation



BUSINESS PLAN 2024-25

MOEMOEA

"*Kia kaua te whenua e riro ai*"

KAUPAPA

"Our kaupapa is to ensure the protection of our whenua, reacquire our whenua tūturu and to build the means to enhance the Social, Cultural and Economic wellbeing of our whānau into the future. We will achieve our kaupapa by developing a reputable brand name in both the beach front property and Angus beef farming industries."

TIKANGA

We have five core values that we are committed to and determine how we develop our business

1. Kaitiakitanga - As Tangata Whenua we will strive to protect and improve Te Taiao, our natural environment.

2. Māramatanga - By being transparent and accountable to our whānau we will ensure that their trust, integrity and confidence in us is sustained.

3. Rangatiratanga - Leadership and direction will be evident in all parts of our business, and in the way in which we conduct ourselves.

4. Wairuatanga - We will observe the tikanga and kawa of our Tūpuna to ensure we develop within the spiritual and cultural context laid down by them.

5. Whanaungatanga - Relationships are fundamental to our kaupapa and we will ensure that we put energy into developing relationships and supporting good communications with whānau and key stakeholders.

5. KAITIAKITANGA – HAPAI ONA TIKANGA

GOAL 2021 - 2025	Critical Success Factors 2021 - 2025	Key Result Area 2024 - 2025
5.1 Waterway protected from farm Activities.	5.1.1 All waterways fenced off. 5.1.2 All waterways with location suitable riparian planting to stop run off. 5.1.3 Water quality being monitoring and recorded .	5.1.3.1 Two water samples collected and monitoring data recorded in register on quality.
5.2 Environment restoration in our native bird and plant spaces,	5.2.1 Environment plan for organisation reviewed and updated. 5.2.2 Animal and plant pest control plan implements for all blocks with outcomes evident. 5.2.3 Planted exotic tree stands removed and replanted with natives. 5.2.4 Designated native bird spaces mapped and activity protected. 5.2.5 Two hectares of TEW forestry retired from the ETS.	5.2.1.1 Environment plan for organisation developed that integrates farming, pest control and other reserve areas. 5.2.2.1 Collaboration with Te Runanga o Ngati Rehia on implementation of their 2050 pest free plan. 5.2.3.2 Pines harvested at Tapuaetahi Farm. 5.2.4.1 Implementation of sand spit and beachfront flora restoration plan. 5.2.4.2 Identify and map second native bird space to be actively protected. 5.2.4.3 Promote the establishment of a beachfront coast care group involving schools, beach and Te Tii residents. 5.2.5.1 Investigate pros and cons of registration with ETS and if positive register new planting.
5.3 Moana protected from farming operation and supported with restoration projects.	5.3.1 Assistance provided to get hapu governance control over our Fishery. 5.3.2 Restoration and fishery management projects assistance to support the protest of our Fishery.	5.3.1 Support Te Runanga o Ngati Rehia (time permitting) with the Marine and Coastal Act bill submission, with specific focus on Tapuaetahi and Te Tii marine spaces. 5.3.3.1 Develop a restoration and fishery management project outline.

STRATEGIC PLAN 2026 – 2030

(1 July 2025)

Tapuaetahi Incorporation

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5. Whanaungatanga - Relationships are fundamental to our kaupapa and we will ensure that we put energy into developing relationships and supporting good communications with whānau and key stakeholders.

5. KAITIAKITANGA – Restoring our whenua and moana.

GOAL	Critical Success Factors
5.1 Waterway protected from farm Activities.	5.1.1 All waterways fenced off. 5.1.2 All waterways with location suitable riparian planting to stop run off. 5.1.3 Water quality being monitoring and recorded.
5.2 Environment restoration of fauna and flora.	5.2.1 Environment plan for organisation reviewed and updated including Te Wairua. 5.2.2 Animal and plant pest control plan implements for all blocks with outcomes evident including Te Wairua. 5.2.3 Designated native bird spaces mapped and activity protected. 5.2.4 Two hectares of TEW forestry retired from the ETS. 5.2.5 All wahi tapu and sites of significance recorded with appropriate protections in place. 5.2.6 Opportunities for local schools (Te Rui) created for participation in restoration of fauna and flora projects.
5.3 Moana protected from farming operation and supported with restoration projects.	5.3.1 Assistance provided to get hapu governance control over our Fishery. 5.3.2 Restoration and fishery management projects assistance to support the protest of our Fishery. 5.3.3 Pro-active in preventing Caulerpa coming into our inshore waters.

6. SHAREHOLDERS – GROWING THE ECONOMIC CAPACITY OF THE INCORPORATION.

GOAL	Critical Success Factors
6.1 Key shareholder records relocated to office.	6.1.1 Communications plan developed for shareholder news and engagements. 6.1.2 Important historical organisational documents have been archived in our repository. 6.1.3 Important organisational records, held by Maori Land court, identified and copies relocated to our office. 6.1.4 Shareholder questions on some previous land transactions are answered

Environmental

Native forestry – this will be used for Erosion control on all of our land blocks as well as providing habitat for native birds, honey production and selective harvesting of timber for improving the forest stand.

Organisational footprint – Our presence in any area will be noted as one that strongly demonstrates our values. Our businesses will aim to rejuvenate the nature environmental where the business is located.

Riparian fencing and planting – we will have generous borders between our farming operations, and other land use, with our waterways that will be fenced off. This includes the coast. A species that is conducive to the area will be used, where we can also look to arrest other financial benefits.

Exotic free – we will look to remove all exotic trees and plants from our properties.

Pest free – we will look to remove all Tests from our properties and have a strong plan that continues to monitor and maintain a pest free environment. This includes the Purerua peninsula being completely Pest free in which we will play a pivotal role in.

Waterway ecology restoration – in addition to our waterways being fenced off with Riparian planting we will also have plants conducive to supporting the return of the ecology to those watercourses and cultural kai.

Moana restoration - We will be actively involved in the restoration of the ecology of our reefs and moana adjacent to our Whenua, supporting the return of the mauri through our efforts.

Rahui - We will work with local authorities to stop the continued demise of our fishery through trying to get a no commercial take area established on our coast and periodic temporary closures for everybody in parts.

Native Bird Life restoration – we will look to Establish more native bird sanctuaries on our lands and plant with plants that support their natural habitat. Dotterels, Kiwi and Kukupa focus for Tapuaetahi and Te Whangae.

RESTORATION PLAN FOR THE TAPUAETAHI BEACH SPIT AREA

Introduction and brief

Tapuaetahi Incorporation is considering weed control and restoration of the spit area located on their land; along the coast, at the mouth of Taronui River. Tapuaetahi Incorporation owns the land between the coast, and Purerua Road (*c*.270 ha) and includes an area with 52 leased properties, shareholder parking, natural forested areas, and a dry stock wagyu farm.

Over time a spit has formed where Taronui River meets the open coast and is effectively a natural sand barrier with an estuary in behind. The spit is constantly changing, particularly at its western most end but generally extends between 220-270m[1] long (vegetated and non-vegetated). The spit, between the foredune and estuary, is at its widest and currently c. 80m[1]. The foredune on the northern side is also constantly changing as wind and weather helps to dump sand or conversely take it away.

Aotearoa has a unique set of coastal plant species that allow dune systems to ebb and flow; they help build when able and reinstate when eroded. Often introduced species do not have the same specific attributes to bind the sand and can have a negative effect on a natural dune system shape. Tapuaetahi Incorporation understands the spit includes a mosaic of both native plants, introduced plants, and pest plants and is considering their options to help restore the area to a more natural state.

Restoring and improving the balance of native versus exotic plant species will not only continue to stabilise this dynamic dune system it will provide improved habitat for the native bird, invertebrate and coastal faunal species. A natural Aotearoa beach habitat is visually attractive and includes flora and faunal species unique to its environment.

This report provides the Incorporation with a weed map of the spit area taken during a rapid field survey in July and August 2023. This map and will help the Incorporation get a clear understanding of the current landscape. The added Restoration Plan will provide direction into the future.

Report content

- Recent aerial photography[1] was used to help map the different vegetation and habitat types during two quick site visits.
- Once mapped and described, Management Areas were created to form the basis of a Restoration Plan.
- Pest plant control methods are also described.

Vegetation and habitat types

Eight current Vegetation and Habitat Types are broadly described below; refer to Figure 1 for the location[2].

1 Sand

[1] Google Earth aerial photography dated 20 November 2022

[2] Note: Vegetation descriptions and mapping do not include the area further to the west than presented in Figure 1 and 2.

Exposed sand with coastal debris from the ocean occurs on the northern side and western tip of the spit and on the southern side when the tide leaves it exposed.

2A. Spinifex grassland

Spinifex (kōwhangatara, *Spinifex sericeus*) is the predominant native species along the northern side of the dune, immediately behind the sand vegetation type. Other natives present include sand wind grass (*Lachnagrostis billardierei*), wīwī (*Ficinia nodosa*), and occasionally pīngao (*Ficinia spiralis*). Exotic plant species in this area include South African ice plant (*Carpobrotus edulis*), sweet pea shrub (*Polygala myrtifolia*), *Gazania* spp, buffalo grass (*Stenotaphrum secundatum*), pampas (*Cortaderia selloana*) and *Dimorphotheca fruticosa*.

2B. Spinifex grassland

In behind the mobile grassland is an area of spinifex grassland that is more stabilised. It has patches of wīwī throughout. Native sand wind grass and exotic buffalo grass, pampas, South African ice plant and sweet pea shrub are also scattered throughout. Pōhuehue (*Muehlenbeckia complexa*) occurs in small patches.

3 Buffalo grass grassland

Buffalo grass with occasional spinifex patches occur within the spinifex grassland (2B), one of which is a relatively large area. South African ice plant, sweet pea shrub and wīwī are also present within this grassland area. Pōhuehue is occasionally outcompeted by the buffalo grass. In places the buffalo grassland is in a mosaic with the spinifex grassland (2B) vegetation type.

4A. Kikuyu grassland

The shareholders carpark is predominantly covered in kikuyu grass with scattered patches of sweet pea shrub, wīwī, South African ice plant, agapanthus (*Agapanthus praecox*), and *Dimorphotheca.* Buffalo grass is also present. This area is mown for parking.

4B. Kikuyu grassland

Kikuyu grassland also occurs to the right of the shareholders carpark and has patches of gazania, gorse and lavender occurring within the long grass.

5 Sweet pea shrub/ gazania – wīwī-(spinifex) herbfield

Gazania herbfield with sweet pea shrub, wīwī and spinifex throughout is the predominant vegetation type north of the shareholders carpark. The exotic gazania forms large dominant patches. A couple of *c.* 4 m pōhutukawa (*Metrosideros excelsa*) have been planted in this area. Other exotic plant species in this area include South African ice plant, banksia (*Banksia integrifolia*), and *Dimorphotheca*. Other natives present include sand wind grass, pīngao, and wīwī.

6 Sweet pea shrub/ wīwī shrubland

Sweet pea shrub forms a 'barrier' like row in behind the spinifex grassland. Wīwī is common in this area too, as is South African ice plant. Gazinia, *Dimorphotheca*, pampas, and spinifex are also present in this vegetation type.

Figure 1: Vegetation types 1 - 6

1. Sand
2A. Spinifex grassland
2B. Spinifex grassland
3. Buffalo grass grassland
4A. Kikuyu grassland
4B. Kikuyu grassland
5. Sweet pea shrub/ gazania – wīwī-(spinifex) herbfield
6. Sweet pea shrub/ wīwī shrubland

Management Areas and Restoration Plan summary

From the Vegetation and Habitat Types described in the section above, a series of Management Areas can be derived. Management or restoration of the spit includes removing weed plant species and making the entire spit area native dominant rather than exotic dominant as it currently is in places. Four Areas, in order of priority, have been suggested below.

To promote a sense of accomplishment and create early restoration gains it is recommended that management starts in areas that are more naturally intact (i.e. less weeds) and areas that will show immediate change. As an example, Management Area 1 includes Vegetation Types 1, 2A, 4A and 6 (see Figure 2 below).

Once each Management Area has made restoration gains, then the next area can start. Each area that has been started should be monitored in subsequent years and weeds continually supressed.

Management Area 4 has been included in this plan (Vegetation Type 4B) but equally can be removed if the Incorporation chooses to do so. See works describes in the section below for explanation.

The table below summaries and helps to direct work efforts over time. Figure 2 provides a visual picture of the Management Areas and Restoration Plan.

Table 1: Vegetation Types sorted into Management Areas and their relative start timings. Note: the red tick indicates the first year of restoration for each Management Area.

Vegetation type	Management area	Restoration Plan per year			
		Year 1	Year 2	Year 3	Year 4
1	1	√	√	√	√
2A	1	√	√	√	√
2B	2		√	√	√
3	3			√	√
4A	1	√	√	√	√
4B	4?				√
5	2		√	√	√
6	1	√	√	√	√

Management Areas and Restoration Plan – works described.

Management Areas and Restoration works are briefly described below and mapped in Figure 2. Pest plant control methods are presented in Appendix 1 with photos of each weed species to control in Appendix 2.

Management Area 1

This includes the sand field on the northern side of the spit; the spinifex grassland just in behind the open sand area; the exposed sand on the southern side of the spit; the shareholders carpark; and the sweet pea shrubland.

This area was chosen as the first to be restored because there are fewer weeds that once removed or controlled will immediately change the look of the spit area. Other native species already present in these areas will then be able to dominate.

Dominant weeds here include South African ice plant, sweet pea shrub, Gazinia, buffalo grass, pampas, *Dimorphotheca*, and agapanthus.

Management Area 2

This Area includes the more intact rear dune area of spinifex and the area north of the shareholders car park which forms the bulk of the spit. Weed control and management will significantly change the landscape in an area (particularly north of the carpark) that is widely used and appreciated by leasees and shareholders alike.

Dominant weeds here include South African ice plant, sweet pea shrub, Gazania, buffalo grass, pampas, banksia, and *Dimorphotheca*.

This area will need some additional planting of native spinifex, pīngao, and pōhuehue to fill in the gaps left by the weed control efforts. Plants will need to be ordered at least by the start of Year 1 of the restoration[1].

Management *Area 3*

Management Area 3 includes areas dominated by exotic buffalo grassland. This will have to be managed in stages to control and remove the buffalo grassland but should not leave a large area of exposed sand.

A grass specific spray (Haloxyfop) could be used on the buffalo grass, but this will have to be done carefully so that it does not affect the naturally occurring spinifex or sand wind grass. This specific spray will not kill pōhuehue, wīwī, or woody weeds and is an excellent method to control exotic grasses without compromising the woody native plant species. Once released from buffalo grass pōhuehue and wīwī will be able to flourish.

Plantings of spinifex, wīwī, and pōhuehue are recommended here to supplement and increase the frequency of natives that are already there. Plants will need to be ordered at least by the start of Year 2 of the restoration[1].

Management Area 4

This includes a large area of unmown kikuyu grass with several different weeds scattered throughout. This area will require a significant amount of time and effort to remove the exotics and plant natives and should only be tackled once successes of the remaining area are realised and if the Incorporation wishes to undertake the large-scale works.

Access routes

It is recommended that accessways to the beach are little more formalised because; beach goers will:

1) be led the same way to the beach each time.
2) not walk over the fragile dunes system and vegetation.
3) help the dunes and vegetation 'recover' once the weeds have been removed.

Bare sand access with a fence to focus the pathway will probably be the best design however some beach access designs, sourced from the internet, are presented in Appendix 3.

Summary and conclusions

A Restoration Plan with Management Areas has been developed for the Tapuaetahi Incorporation to help their decision-making for the management of the Tapuaetahi spit.

This plan can be used to inform contractors or the community who may help to retore the area. Restoration will provide a more natural habitat for the local birds and invertebrates that inhabit the naturally forming spit barrier.

[1] Plants may be able to be sourced via the Northland Regional Council Coast Care Coordinator.

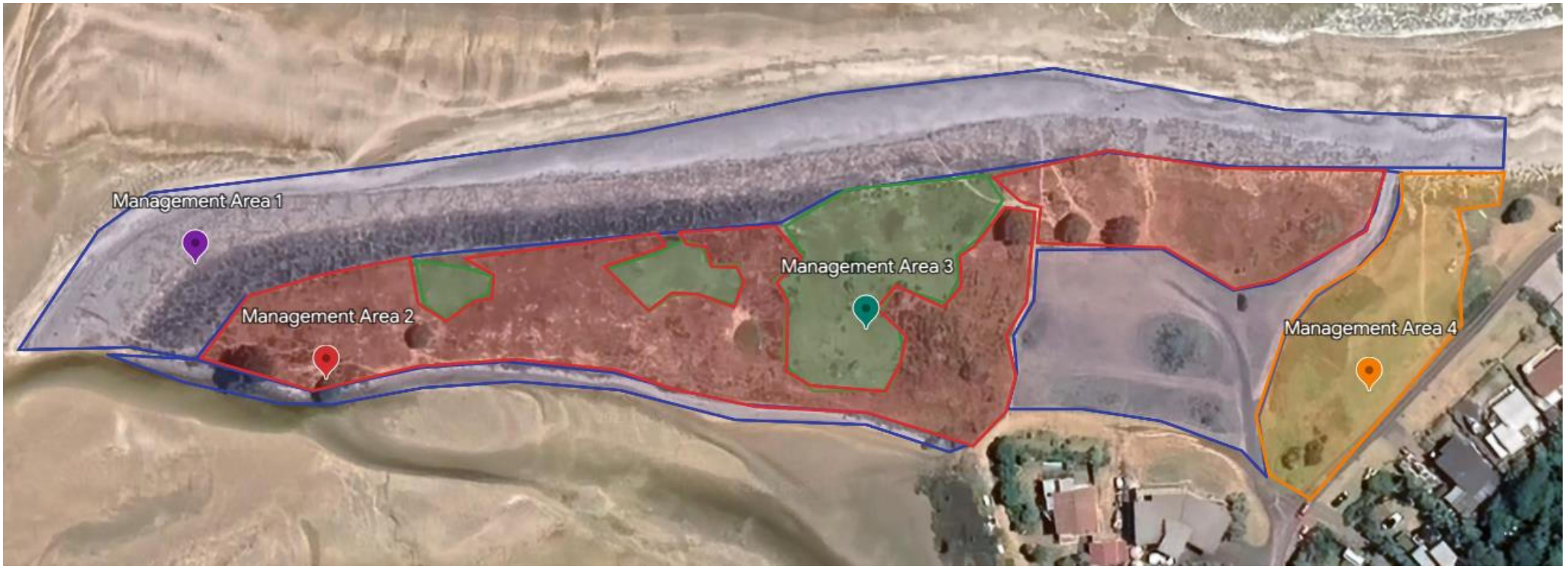


Figure 2: Management Areas 1-4

Appendix 1: Pest plant control techniques

The Table below provides a guide for controlling the main weed species on the spit area.

Table 2: Pest plant species present on the spit area and their suggested control method.

Pest plant	Control method	Chemical	Application rate	Timing	Notes
Agapanthus *(Agapanthus praecox)*	Dig out and dispose off site			Year round	Recommended for small patches. Only if this can be done without posing a weed hygiene risk.
	Knapsack (foliar spray)	Triclopyr	60 ml triclopyr + 20ml organosilicon / 10 L water	Year round	Will require repeat applications
	Cut and treat stems	Picloram	Vigilant gel	Year round	
	Cut and treat stems	Triclopyr	100ml triclopyr / 1L water	Year round	Slash leaves close to ground, leave on site to rot down. Treat fresh bases with herbicide mix.
Banksia *(Banksia integrifolia)*	Hand pull seedlings/ small plants			Year round	Easy in sand dunes. Need to ensure all roots are pulled from ground.
	Cut and treat stumps	Glyphosate	Glyphosate mix** **Use glyphosate (e.g., Roundup) at the rate of 1 part glyphosate to 4 parts water (e.g. 1 cup to 4 cups). Cut the plants down as close as possible to the ground. Apply herbicide mix liberally to the cut surface and sides of the stump to ground level using a small trigger or paintbrush (or knapsack for multiple plants).	Year round	Note this method with 4:1 water: glyphosate will work for ANY plant/tree likely to sprout from the stump.
Buffalo grass (*Stenotaphrum secundatum*)	Foliar spray	Haloxyfop	150 ml / 10 L water + penetrant		Will only kill grasses
	Knapsack (foliar spray)	Glyphosate 510g/L	200ml glyphosate/10L water + penetrant	October - April	Need to spray entire plant. Will kill other plants. Haloxyfop is more effective.
Dimorphotheca fruticosa	Hand pull and turn over to expose roots				
	Knapsack (foliar spray)	Glyphosate 510g/L	200ml glyphosate/10L water + penetrant	October - April	Ensure desirable species are avoided

Pest plant	Control method	Chemical	Application rate	Timing	Notes
Gazania	Hand pull and turn over to expose roots				
	Knapsack (foliar spray)	Glyphosate 510g/L	200ml glyphosate/10L water + penetrant	October - April	Ensure desirable species are avoided
Kikuyu *(Cenchrus clandestinus)*	Foliar spray	Haloxyfop	60 ml / 10 L water + penetrant	Not after heavy frost	Will only kill grasses
	Foliar spray	Glyphosate	Glyphosate mix**	Year round	Will kill all plants. Haloxyfop is more effective.
	Knapsack (foliar spray)	Glyphosate 510g/L	200ml glyphosate/10L water + penetrant	October - April	Need to spray entire plant. Haloxyfop is more effective.
Pampas *(Cortaderia spp.)*	Knapsack (cut away bulk of the leaves and then foliar spray)	Haloxyfop	150/10L water + penetrant	October - April	
	Hand pull seedlings, small plants			Year round	
South African ice plant (*Carpobrotus edulis*)	Hand pull and turn over to expose roots			Year round	
Sweet pea shrub (*Polygala myrtifolia*)	Hand pull seedlings/ small plants			Year round	
	Cut and treat stumps		Metsulfuron-methyl 600g/kg (1g/L) or a product containing 100g picloram+300g triclopyr/L (100ml/L)	Year round	

Appendix 2: Photos of pest plant species that require control

Agapanthus

Banksia

Buffalo grass

Dimorphotheca fruticosa

Gazania

Kikuyu

Pampas

South Arican ice plant

Sweet pea shrub

Appendix 3: Beach access

Designs that guide beach goers to the foreshore have been sourced from the internet and presented below.

https://www.coastalrestorationtrust.org.nz/site/assets/files/1185/9.2_accessways.pdf

https://www.coastalrestorationtrust.org.nz/site/assets/files/1064/7.2_spinifex_establishment.pdf

https://haveyoursay.midcoast.nsw.gov.au/improving-beach-access

https://beachnearby.com/beach/de-zandmotor-the-hague-south-holland

Tapuaetahi Incorporation

Pest Management Plan

350 ha

Prepared by: Andrew Mentor **Kiwi Coast Trust**
NRC Reviewed: Mike Knight **Northland Regional Council**
Reviewed: Mariao Hohaia **Tapuaetahi Incorporation**

Tapuaetahi Incorporation

Pest Control Executive Summary

The Pest Management Plan for Tapuaetahi Incorporation outlines how animal pest species will be controlled to protect native flora and fauna on the property. Tapuaetahi Incorporation is part of the Taronui Area at the neck of the Purerua Penninsula to the east.

The aim for Tapuaetahi is:

> *To provide a safe habitat where native wildlife, including kiwi, can survive and thrive.*
>
> *To control pests at the neck of the Purerua Penninsula.*
>
> *To be part of a landscape scale pest control area.*
>
> *To assist NRC to attain its goals in the Regional Pest Plan to protect the numerous significant natural areas with high ecological value.*

Pest species which will be controlled through this plan include possums, rodents, mustelids, feral cats, feral pigs, feral goats.
These species are ideally controlled by an "integrated pest programme" using a combination of trapping, toxin and shooting to reduce all pest species together over a period of time. Mustelid and feral cat control will be with the assistance of the Mid North High Value Area, by mutual agreement. Feral goats and pigs, which browse regenerating understories, will be controlled by Tapuaetahi Corporation by shooting and/or trapping. Possums will be reduced by cyanide toxin plus night shooting as determined by the trustees. Rat control will be a by-product of the mustelid trapping plus the option of toxin applied at the best timing for seasonal knockdown. Rabbits may be controlled by a combination of shooting and/or toxin (Pindone), as per trustee policy.

Kiwi are most directly affected by mustelids and feral cats. Without pest control, 90% of juvenile kiwi are killed before they reach a size where they can fend off predators. Dogs are a major risk to adult birds and Tapuaetahi have a strict "dogs under control at all times" policy.
Through working together, community groups and organisations will be more efficient and effective. Instead of each project battling to reduce plant and animal pests in the face of constant reinvasion, a combined approach will enable pest reduction at a landscape scale.

With support from Northland Regional Council and Kiwi Coast community-led conservation projects in the area have been able to carry out biodiversity restoration, including:

- Integrated animal pest control to reduce rats, possums, feral cats, feral pigs, feral goats, weasels, stoats, ferrets.
- Fencing off native forest areas from stock.
- Fencing and restoring riparian river strips.
- Habitat restoration through plant pest control, wetland restoration and native tree planting.
- Community engagement, education and advocacy to encourage good dog control to protect threatened native species such as kiwi, pateke, Australasian bittern, banded rail, marsh crake and dotterel.

Background

There has been some pest control around 5-10 years ago. Stoat and cat traps were installed and possum toxin was applied.
However the work folded in 2014 when the NZ Kiwi Foundation wound down its operations.
In October 2018, as part of a Biofund, NRC, with help from Kiwi Coast, supplied stoat and cat traps to the value of $3000 for the farm.
Previously installed trap boxes have been found and replaced with new ones.

Trapping Methodology

The NRC guideline is 1 predator trap per 10 hectares for stoat control in moderate to dense forest. For grassed farmland, 1 trap per 20 hectares is recommended as predators/pests predominate under vegetation cover.
A contract trapper will service the traps to best practice standard. The cost of this will be covered by the Mid-North High Value Area, subject to annual review.
The total farm area is 350 ha. The minimum effective trap density would be from 35 traps sites around the farm. The biennial monitoring with wax tag bite mark index (BMI) will indicate trapping effectiveness. Adjustments will be made depending on results.
Upskilling of Tapuaetahi staff in trap checking and re-setting is available, and can be done on the farm.
Feral cats can carry toxoplasmosis which can lead to abortion in stock and sickness in workers.

OBJECTIVES

The following objectives have been identified:

Objective 1: Set up a trapping network.

Traps will include DOC 200 double and single kill traps for stoats, weasels, rats.
(Hedgehogs are trapped as a by-kill).
Kill traps at selected locations for feral cats/possum.
DOC 250s for ferrets will be located within the network as needed.

Trap Type	**Pest species**	**Number**	
DOC200 kill trap	Stoat, weasel, rat	35	
SA2 kill trap	Feral cat, possum	35	
DOC250	Ferret	Deployed if needed	Contingency
Rat trap	Ship & Norway rat	Deployed if needed	Trap, toxin or both
TOXIN	**Pest species**	**Action**	
Cyanide	Possum	Non secondary kill	CSL operator required

Trap GPS locations will be up-loaded to Map 2 when the file is ready to be loaded. Kill data will be recorded by the trapper/pest controller.

Objective 2: Service traps to set frequency

Frequency four-weekly over winter, three weekly over summer. A minimum of fifteen trap servicing rounds will cover an annual service. Eggs and/or salted rabbit will be the preferred bait for mustelid traps. Salted rabbit or fish will be used in the feral cat traps.

Objective 3: Pest control in New Riparian Fenced Areas

Add pest control where riparian fencing and planting has been installed, where stock are excluded and pest species are noted or likely.

Objective 4: Monitor kiwi call data

Re-establish the Tapuaetahi listening site (#202 as per Call Count Monitoring of Northland Brown Kiwi 2017) The last listening was 2013 with call rate 7.38 calls/hour.

Any further questions, please contact the author, Andrew Mentor Kiwi Coast 0224 675 173

1.0 Pest Control Strategic Plan Outline

This Pest Management Plan for Tapuaetahi Incorporation outlines how animal pest species will be controlled to protect native flora and fauna on the property. Tapuaetahi Incorporation is part of the Taronui Area at the neck of the Purerua Penninsula to the east.

The aim for Tapuaetahi is:

- *To provide a safe habitat where native wildlife, including kiwi, can survive and thrive.*
- *To control pests at the neck of the Purerua Penninsula.*
- *To be part of a landscape scale pest control area.*
- *To assist NRC to attain its goals in the Regional Pest Plan to protect the numerous significant natural areas with high ecological value.*

Pest species which will be controlled through this plan include:

- Possums
- Rodents
- Mustelids
- Feral cats
- Feral pigs
- Feral goats

These species are ideally controlled by an “integrated pest programme” using a combination of trapping, toxin and shooting to reduce all pest species together over a period of time. Mustelid and feral cat control will be with the assistance of the Mid North High Value Area, by mutual agreement. Feral goats and pigs, which browse regenerating understories, will be controlled by Tapuaetahi Corporation by shooting and/or trapping. Possums will be reduced by cyanide toxin plus night shooting as determined by the trustees. Rats will be a by-product of the mustelid trapping. Rabbits may be controlled by a combination of shooting and/or toxin (Pindone), as per trustee policy.

Kiwi are most directly affected by mustelids and feral cats. Without pest control, 90% of juvenile kiwi are killed before they reach a size where they can fend off predators. Dogs are a major risk to adult birds and Tapuaetahi have a strict “dogs under control at all times” policy.

Weed species will be identified by Tapuaetahi Corporation as part of a farm weed pest plan.

2.0 Ecological Values of the Area

Tapuaetahi and the Taronui Pest Control Area are in the Kerikeri District.
aim for Tapuaetahi is:

Coastal, island and wetland habitats are a feature of the Kerikeri Ecological District which covers approximately 67,600 ha in the northern and central Bay of Islands and is also considered a stronghold for Northland brown kiwi. A total of 86 natural areas in this district were considered to be of regional or national significance by Conning and Miller (1999).

A high degree of fragmentation is a feature of the habitats in the Kerikeri Ecological District. Many areas of vegetation may appear to be no more than "scrub" and full of weeds, but actually provide habitat for some of the most dense kiwi populations in Northland, especially on the Purerua Peninsula.

Across the Kerikeri Inlet, the large wetland sequences and their associated threatened species within the Waitangi Forest are unique in many regards. They are ponded lava flows and contain several wetland types and constitute one of the largest freshwater complexes in Northland.

Other features of the Ecological District include a large flood-plain associated with the Kawakawa River, a unique gum-land association surrounding the Kerikeri airport, and some large forested upper catchments in the west, which are also important for kiwi. Rivers, such as the Takou and Kerikeri, have much of their value arising from a high proportion of indigenous vegetation in the riparian zones of both the main river and tributaries (Conning and Miller, 2000).

3.0 Background of Mid North Landcare Groups

The Mid-North has a large number of active, autonomous groups involved in pest control:

- Puketi Forest Trust
- Waimate North Landcare Trust
- Kerikeri Puketotara Catchment CPCA
- Maungaparerua Stream CPCA
- Hupara Landcare
- Bay Bush Action Trust Opua
- Waitangi Iwi Kiwi Trust
- South Kerikeri Inlet Landcare
- Kerikeri Penninsula Landcare
- Aroha Island Trust
- Cottle Hill Landcare, Kerikeri
- Pukewhau Bulls Gorge, Kerikeri
- Blue Gum Lane Trappers, Kerikeri
- Springbank Collective Trappers, Kerikeri
- Whiritoa Stream Trappers, Waipapa
- Onekura Road Trappers, Waipapa
- Upokorau-Summit Ecological Project, Kapiro-Takou Bay
- Top Energy, Ngawha
- Hancocks Rakautao Forest, Ngawha
- Landcorp Kapiro

- Kauri Cliffs
- Taronui-Purerua Penninsula

The current combined project area of these groups is approximately 40,000ha, although not all of this is actively managed for pests. A primary aim of the Kiwi Coast-NRC Mid-North Strategic Plan is to expand pest control over the remaining unprotected land, where landowners are willing.

Land Tenure
The 40,000ha area encompassed within the Mid-North Area is predominantly in private ownership, other than Puketi and Opua Forests which are DOC administered conservation areas. Public land also consists of small areas of FNDC reserve, small DOC reserves and land at Waitangi managed by PF Olsen and China Forestry on behalf of the DOC Endowment Forest.

DOC is responsible for the Puketi/Omahuta Forest of which 8000ha is under active management by Puketi Forest Trust. The major forestry companies operating in the Mid-North are Hancock Forest Management (HFM), Northland Forest Managers (NFM), PF Olsen, Summit Forestry and China Forestry.

The local towns of Kaeo, Paihia, Russell, Kerikeri, Waipapa, Okaihau, Kaikohe, Ohaeawai and Kawakawa-Moerewa are within the area. Russell township has initiated a "Pest Free Russell" initiative for community pest control. Kiwi Coast Mid-North has relational links to rural communities on farms and lifestyle blocks, forestry blocks, corporate farming operators, service clubs, schools and iwi.

Essentially, it is up to community groups, companies, district council, regional council, DOC, iwi and NGOs to protect the remaining biodiversity and values of the Mid-North. Kiwi Coast Mid-North aims to support the independent work of all local projects and organisations, and encourage local landowners to participate in biodiversity stewardship. Kiwi Coast Mid North is aiming to assist groups and organisations which are actively helping to protect their part of the environment.

Kiwi Coast will help build the skills, capacity and resources for interested landowners through their local Landcare Group or organisation to realise their goals of environmental stewardship. This includes trapping, trapper training, and coordination of activities.

Collective Benefits
Through working together, community groups and organisations will be more efficient and effective. Instead of each project battling to reduce plant and animal pests in the face of constant reinvasion, a combined approach will enable pest reduction at a landscape scale.

With support from Northland Regional Council and Kiwi Coast community-led conservation projects in the area have been able to carry out biodiversity restoration, including:

- Integrated animal pest control to reduce rats, possums, feral cats, feral pigs, feral goats, weasels, stoats, ferrets.
- Fencing off native forest areas from stock.
- Fencing and restoring riparian river strips.
- Habitat restoration through plant pest control, wetland restoration and native tree planting.
- Community engagement, education and advocacy to encourage good dog control to protect threatened native species such as kiwi, pateke, Australasian bittern, banded rail, marsh crake and dotterel.

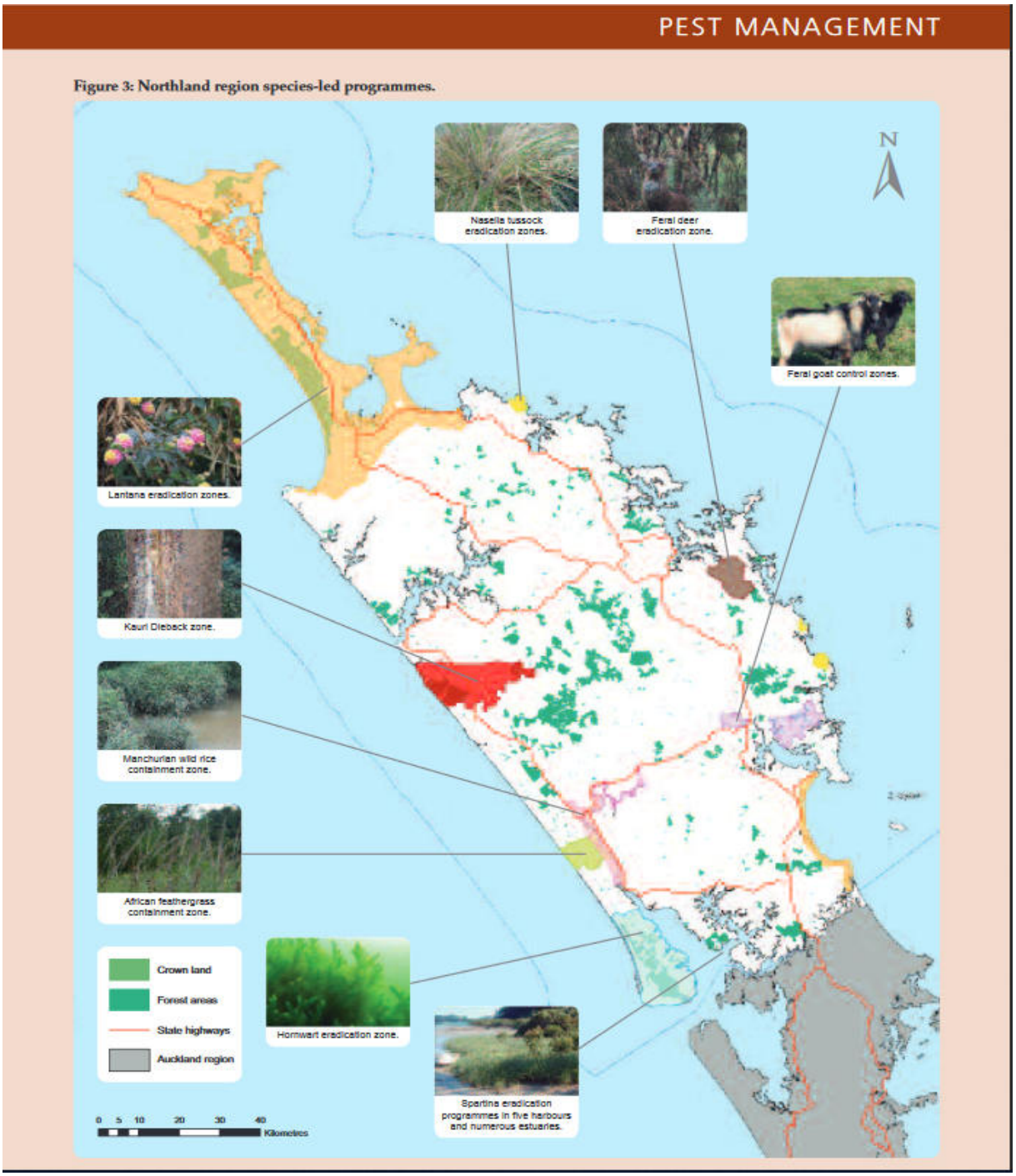
4.0 NRC Pest Management Strategies

4.1 NRC Pest Animal List

The animal pests included in Northland's pest plan:

• Ferrets (*Mustela putorius furo*)	• Possum (*Trichosurus vulpecula*)
• Stoats (*Mustela erminea*)	• Feral cat (*Felus catus*)
• Weasels (*Mustela nivalis*)	• Feral pigs (*Sus scrofa*)
• Norway rat (*Rattus norvegicus*)	• Feral goats (*Capra aegagrus*)
• Ship rat (*Rattus rattus*)	• Hedgehog (Erinaceus europaeus)

Figure 3: Northland Region Species-led Programmes



4.2 NRC Pest Plant List

The plants included in the Northland pest plant plan:

• African feather grass	• aquatic weeds (five species)
• Bathurst bur	• broom
• forest invader plants (32 species)	• gorse
• mistflower	• lantana
• Manchurian ricegrass (also known as Manchurian wild grass)	• Nassella tussock
• nodding thistle	• pampas grass
• privet	• ragwort
• spartina	• wild ginger

5.0 Health and Safety

- Pest Contractors will undertake a Health & Safety induction.
- Pest Contractors will have an up-to-date Health and Safety policy and plan.
- Appropriate Public Liability and Indemnity Insurance to be held.

Map 2: Tapuaetahi Farm within Taronui Pest Control Area

5.0 Tapuaetahi Pest Plan Objectives

The following objectives have been identified:

Objective 1: Set up a trapping network.

Traps will include DOC 200 double and single kill traps for stoats, weasels, rats.
(Hedgehogs are trapped as a by-kill).
Kill traps at selected locations for feral cats/possum.
DOC 250s for ferrets will be located within the network as needed.

Trap Type	**Pest species**	**Number**	
DOC200 kill trap	Stoat, weasel, rat	35	
SA2 kill trap	Feral cat, possum	35	
DOC250	Ferret	Deployed if needed	Contingency
Rat trap	Ship & Norway rat	Deployed if needed	Trap, toxin or both
TOXIN	**Pest species**	**Action**	
Cyanide	Possum	Non secondary kill	CSL operator required

Trap GPS locations will be up-loaded to Map 2 when the file is ready to be loaded. Kill data will be recorded by the trapper/pest controller.

Objective 2: Service traps to set frequency

Frequency four-weekly over winter, three weekly over summer. A minimum of fifteen trap servicing rounds will cover an annual service. Eggs and/or salted rabbit will be the preferred bait for mustelid traps. Salted rabbit or fish will be used in the feral cat traps.

Objective 3: Pest control in New Riparian Fenced Areas

Add pest control where riparian fencing and planting has been installed, where stock are excluded and pest species are noted or likely.

Objective 4: Monitor kiwi call data

Re-establish the Tapuaetahi listening site (#202 as per Call Count Monitoring of Northland Brown Kiwi 2017) The last listening was 2013 with call rate 7.38 calls/hour.

6.0 Tapuaetahi Pest Methodology

Background

There has been some pest control around 5-10 years ago. Stoat and cat traps were installed and possum toxin was applied.
However the work folded in 2014 when the NZ Kiwi Foundation wound down its operations.
In October 2018, as part of a Biofund, NRC, with help from Kiwi Coast, supplied stoat and cat traps to the value of $3000 for the farm.
Previously installed trap boxes have been found and replaced with new ones.

Trapping Methodology

The NRC guideline is 1 predator trap per 10 hectares for stoat control in moderate to dense forest. For grassed farmland, 1 trap per 20 hectares is recommended as predators/pests predominate under vegetation cover.
A contract trapper will service the traps to best practice standard. The cost of this will be covered by the Mid-North High Value Area, subject to annual review.
The total farm area is 350 ha. The minimum effective trap density would be from 35 traps sites around the farm. The biennial monitoring with wax tag bite mark index (BMI) will indicate trapping effectiveness. Adjustments will be made depending on results.
Upskilling of Tapuaetahi staff in trap checking and re-setting is available, and can be done on the farm.
Feral cats can carry toxoplasmosis which can lead to abortion in stock and sickness in workers.

TRAP SUMMARY

PEST	TRAP	TOXIN	OTHER
Possum	SA2, Timms, Trapinator	Cyanide	-
Cat	SA2, Live capture	-	Shooting
Stoat, weasel, juvenile ferret	DOC 200	-	-
Rat (Norway & ship)	DOC 200, Victor, Snappy	-	-
Pigs	Live capture pen	-	Shooting
Goats	-	-	Muster, shooting

Bait types will vary between trap type and season. Rabbit, eggs and fish will most generally be used.

FARM AREA

Tapuaetahi	AREA	
Total Farm	350 ha	(140 ha effective grazing)

7.0 Annual Contributions

Total annual contributions:

	NRC Capital for Traps	MN HVA Trapper Cost	Mid-North High Value Area - materials	Other funding or work in-kind	Total Cost
Year 1 2018/19	3,000	1,500	500	500	**5,500**
Year 2 2019/20	500	1,500	500	500	**3,000**
Year 3 2020/21	-	1,500	500	500	**2,500**
Year 4 2021/22	-	1,500	500	500	**2,500**
Year 5 2022/23	-	1,500	500	500	**2,500**
Total	**$3,500**	**$7,500**	**$2,500**	**$2,500**	**$16,000**

(Financial year based on 1 July - 30 June)

8.0 Control Objectives and Methods

SPECIES	ESTIMATED POPULATION	CONTROL METHOD	MAINTENANCE LEVEL REQUIRED
Possum	Medium to high	Trapping, (Poison)	Possum levels controlled at or below 12%.
Rodent	Medium to high	Trapping, (Poison)	Rodent levels controlled at or below 20%
Mustelid	Medium	Trapping, (Poison)	10% randomly selected kill traps to be set and baited correctly
Feral Cat	Medium	Trapping and shooting	10% randomly selected kill traps to be set and baited correctly

9.0 Monitoring outline:

Monitoring will include the following:

- Trap catch records, trap mapping and trap reporting through Trap.NZ
- Annual Kiwi Call Count Survey – one established listening site (Tapuaetahi #202) already exists within the farm area. Historical listening data exists from 2006, 2008, 2009, 2010, 2013. The lowest call rate was 3.0 calls per hour and the highest was 16.5 calls per hour.
- Three yearly 5 minute bird counts or kaka & bellbird counts in conjunction with Kiwi Coast to measure biodiversity outcomes.

All traps and bait stations once established will be GPS recorded.

SPECIES	MONITORING METHOD	FREQUENCY
Possum / Feral cat	Trapping records	Results entered into www.trap.nz quarterly
Mustelid / Rodent	Trapping records	Results entered into www.trap.nz quarterly
Kiwi	Call count / Human and/or Acoustic recorder Minimum 1 site	Annual. Results and annual report to Kiwi Coast Co-Ordinator prior to 30th June for previous year
Native forest birds	5 Minute Bird counts and/or kaka and bellbird surveys	Three yearly in conjunction with Kiwi Coast and Northtec Conservation Management Students

10.0 Audit and Review

10.1 Auditing

Auditing the results (success /failure) of the control operations and maintenance of that control work will be undertaken by either Northland Regional Council staff or approved monitoring contractors.

SPECIES	AUDITING METHOD	FREQUENCY
Mustelid / Feral Cat/ Possum/Rodent	Visual inspection of 10% of kill traps, which are to be set and baited correctly	Annually in July
Possum/Rodent	Wax Tag Monitoring max 10 lines as per NPCA Protocol.	Biennially in July

10.2 Review

- An annual review will take place in good faith between Tapuaetahi Management, Kiwi Coast, NRC and the Pest Contractor.
- Annual pest data and monitoring data will be used to inform the review.

Annual review of a Community Pest Control Plan

Date of this review

Plan title

Commencement date of the plan

Period of review

Summary of results

.

Looking ahead

Other issues

Signed

……

……

……*NRC*

11.0 Sustainability

The backing of NRC, Kiwi Coast and the Mid-North High Value Area Steering Group should give confidence that working together to provide resources, skills and enthusiasm as part of a community-led initiative in Northland. Empowering private landowners, communities, farmers, companies and iwi to carry out their own pest control, appropriate to their situation, is the most sustainable model possible.

In the interests of increasing sustainability, Kiwi Coast and the Mid-North HVA will continue to help motivate and empower landowners to become actively involved in biodiversity stewardship/kaitiakitanga.

12.0 Summary

Pest control on Tapuaetahi will contribute to the biodiversity values on the farm itself and also the wider Taronui Pest Control Area and the Mid North High Value Area.
Tapuaetahi will be showing the way in environmental management in the rural sector and as a key player in landscape scale pest control towards Pest Free Northland.

References:

Conning and Miller, 1999. Natural Areas of Kerikeri Ecological District.

Department of Conservation, 2018. Kiwi Call Count Report 2017.

Kiwi Coast Strategic Plan, 2017.

Te Ahutai Ngāti Rehia Pest Management Plan

Predator Free Mataroa
Prepared for Ngāti Rehia

7 July 2023

Boffa Miskell

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PEPEHA MŌ NGĀTI RĒHIA MATAMOMOE

Tēnei au te mōkai nei ā āku mātua tupuna.
Kua ngaro i te tirohanga kanohi

Ko te rārangi maunga, tū te ao, tū te po
Ko te rārangi tangata,
ka heke, ka heke, ka heke
He maha ōku hapū, kei kō, kei kō, kei kō
Tēnei au ka tātai ake nei ki tōku Ngāti Rēhiatanga
Me tōna rohe e tū tonu nei ōna tohu

Titiro ki te marangai ki te maunga o Tokerau
Ki Rākaumangamanga
Ki tō awa, Te Kerei Mangonui e rere atu nei
Ka huri tāku titiro ki tāku taha matau
Ki ngā pukepuke e rārangi mai rā
Ko Te Waha-o-te-Riri tērā, ko Mātoa tērā,
ko te Pā o Tāreha tērā

Ka ruku atu hau ki roto i Te Awa o Ngā Rangatira
E tū ake rā a Rangitane te Kaitiaki i a Kororipo
Ka huri tāku titiro ki te hau tonga,
ko maunga Pokākā tērā
Ki te awa o Waitangi e haruru mai rā

Ka āwhiowhio atu te hau ki te hauauru
Ko te maunga o Whakataha e tū mai rā
Ko Whakataha hoki te Pā
Ka ririki te huri o te hau
Ko Puketi tērā, ko Puketotara tērā,
Tū mai rā Puke Whau

Ka tau āku kamo ki te raki ki Tākou
Torotoro ki uta, mataratara ki tai

E whakapepeha nei, ko Orongo te Maunga,
Ko Orongo te Pā
Ko Tākou te awa
Ko Mataatua te waka

Ko Hawaiiki Nui
Ki te Moana Nui Ā Kiwa
Tihewa mauri ora

This is I, the descendant of my ancestors
who have all departed

My mountain stands eternal
Mankind passes on
I have many connections to all subtribes
But my Ngāti Rēhiatanga is constant
And so are my lands and sea boundaries

I cast my eyes to the east to my mountain Tokerau
To Rākaumangamanga
To my river, Te Kerei Mangonui
I look to my right
Where lies our landmarks
To Te Waha-o-te-Riri, to Mātoa
And the Pā of Tāreha

I dive headfirst into the River of the Chiefs (Kerikeri Inlet)
Past Rangitane the gaurdian of Kororipo Pā
I gaze Southwards
Toward Mount Pokākā
And onwards to the Waitangi River

Stormwinds blow to the west,
Raging against the sacred mountain of Whakataha
Whakataha the Pā
Venting its anger
On Puketi, Puketotara
and Puke-Whau

Finally, I look to the north, to Tākou
To the beautiful land, To the pristine ocean that nurtures us

To Orongo the mountain
Where Orongo the Pā
beside the Tākou river
guards my waka Mataatua

To Hawaiiki Nui
To the Pacific Ocean
Breathe the life force

Whakatauki

Ngāti Rēhia mata momoe
Ngāti Rēhia mata kakaa
Titiro ki ngā maunga, ngā awa, ngā moana, ngā whenua tapu o Ngāti Rēhia

Ngāti Rēhia the sleeping giant
Ngāti Rēhia faces all challenges, when awakened
Ngāti Rēhia protects our sacred mountains, rivers, sea and lands

Mihi

Ko te wehi ki te Atua te timatanga o te whakāro nui, nāna nei i hanga ngā mea katoa o te rangi, me te whenua, hei painga āno mō tātou mō te tangata, hei hāpai ake i tōna

kororiatanga ki runga ki te mata o te whenua, kia whakapainga tōna ingoa i ngā wā katoa.

Ka mihi ki te hunga kua wheturangitia, haere mai, haere. Hoki atu koutou ki te kāinga tuturu kua oti te whakarite mō tātou mō te tangata, haere, haere whakaoti atu

koutou. Rātou ki a rātou, tātou te hunga ora ki a tātou.

Nō reira e ngā reo, e ngā mana, e ngā hau e whā, tēnei rā te mihi atu ki a koutou i roto i ngā nekenekehanga huhua o tēnei Ao Hurihuri, tēnā koutou, tēnā koutou, tēnā āno

rā tātou katoa.

ACKNOWLEDGEMENTS:

On behalf of the TRONR we wish to acknowledge the various agencies, organisations, professionals and other individuals, including hapū, whānau who have supported this kaupapa in progressing the aims and objectives contained within our Hapū Plan.

Special thanks go to: Northland Regional Council and Boffa Miskel

Kāti rā e āku rangatira, mā te Atua āno rā tātou katoa e tiaki, e arataki, e manaakitia i ngā wā katoa.

Kia ora huihui mai tātou.

Whakarāpopoto Matua - Executive Summary

Te Ahutai

Ko te ahurei taiao

He tupu hāpai

Kia tau te wa

Our future for nature requires a unique spiritual and uplifting action

This pest control implementation plan has been developed for Te Runanga o Ngāti Rehia and associated whanau. It is envisaged to be used as an operational tool to guide mana whenua in the removal of invasive mammalian pests/predators in the desire to restore the mauri of Ngāti Rehia whenua.

The main aspirations of this plan are to empower hapu/whanau and provide members with a positive project of restoration, reconnection, skill development, employment, education and a better understanding of how indigenous environmental knowledge can underpin hapu/iwi conservation mahi.

This project will primarily focus on biodiversity restoration and pest control on Māori owned whenua within the Predator Free Mataroa project area and the Ngāti Rehia rohe. The work on these sites will be led by Ngāti Rehia alongside project partners to control possums, feral cats, mustelids and rats on whenua Māori.

This plan outlines the existing biodiversity values within rohe o Ngāti Rēhia, the project objectives, hapu engagement and the recommended roles and responsibilities. Baseline monitoring guidelines and protocols for both native biodiversity and pest mammal species are provided to ascertain the values and threats to Ngāti Rehia whenua Māori, as well as ongoing information to determine success of the programme. Based upon this knowledge pest and predator control options will be implemented, the detailed methodologies, protocols and best practice of each activity have been described.

Rārangi Kaupapa - Contents

1.0 He Kupu Arataki - Introduction

1.1 He Kupu Arataki - Background

Predator Free Mataroa is one of three landscape scale predator elimination projects being undertaken in the Bay of Islands under a wider Kaupapa called Predator Free Pēwhairangi Whānui. Predator Free Mataroa aims to completely remove predators from the Purerua peninsula. The primary objective of Predator Free Mataroa is the complete removal of possums from over 7,000 ha and sustained ongoing suppression of other pest species including feral cats, mustelids and rats. The Mataroa project will be rolled out in multiple stages across eight zones shown in Map 1. Each zone has a goal of either elimination (red), defence buffer (yellow) or pest suppression (green).

The Ngāti Rehia Predator Free Whenua Māori project forms a key component of the Predator Free Mataroa Project and primarily focus on biodiversity restoration and pest control on Māori owned whenua within the Predator Free Mataroa project area and the Ngāti Rehia rohe.

This Ngāti Rehia Whenua Māori pest management plan has been developed to support the wider Mataroa PF2050 programme and to support the aspirations of Te Runanga o Ngāti Rehia through the restoration of whenua Māori within the Predator Free Mataroa project area and Ngāti Rehia rohe. The Whenua Māori areas which this implementation plan focuses on is shown in Map 2.

The Kiwi Coast Trust and Ngāti Torehina are leading the Predator Free Mataroa pest control work on the eastern end of the peninsula and on other privately owned land throughout the Predator Free Mataroa project area.

Ngāti Rehia have a taiao lead employed by the Northland Regional Council as part of the Predator Free Mataroa programme, whose role will be to coordinate Ngāti Rehia hapu involvement, hapu resources, stakeholders and liaise with project partners and other organisations in the delivery of this Project.

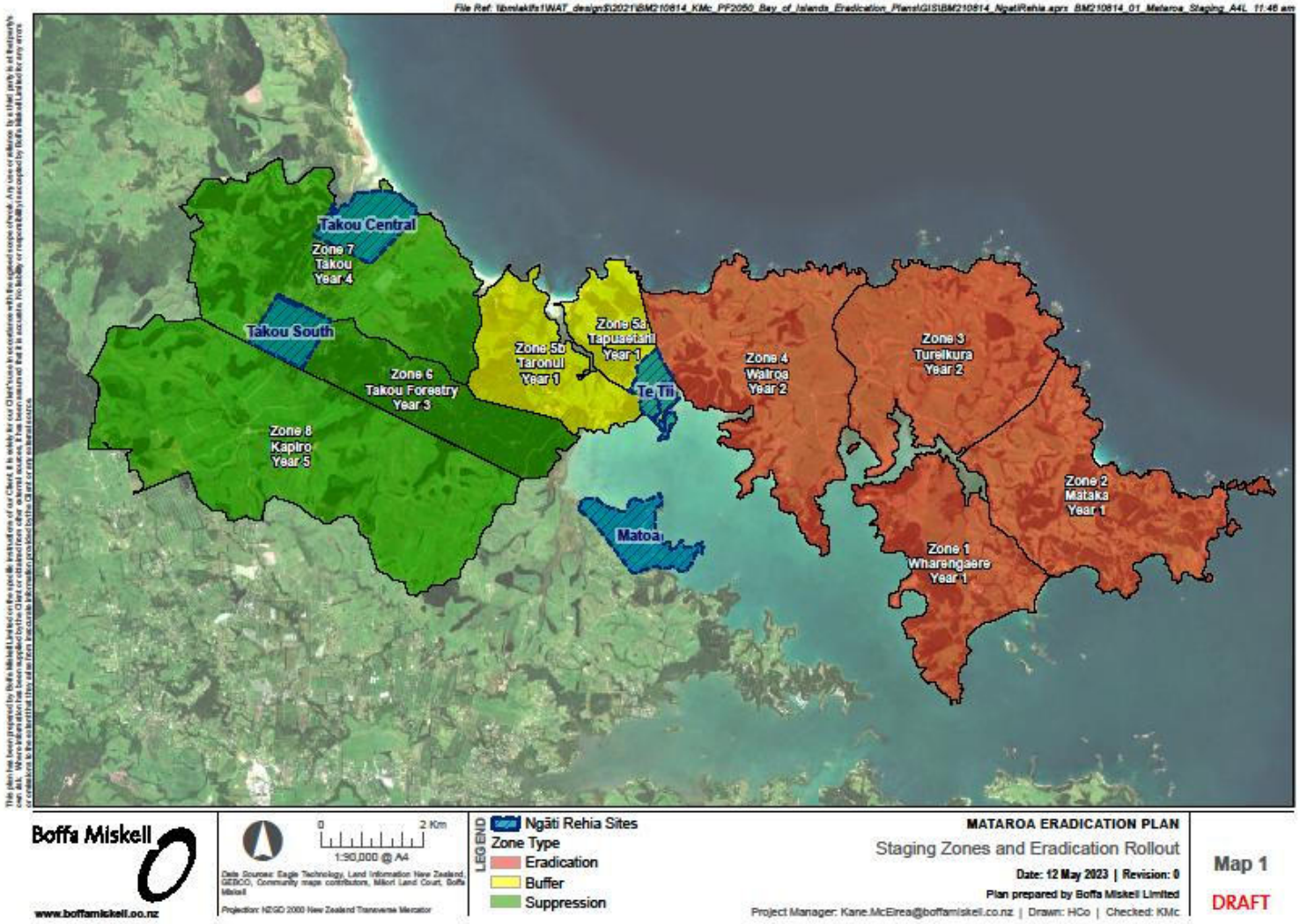
1.2 Tirohanga Whānui - Project overview

This project aims to build a hapu-based biodiversity workforce who are trained, skilled and have the connection to the whenua; by undertaking predator eradication to support the restoration and enhancement of te Taiao. The project will build Ngāti Rehia capacity and capability through supporting kaimahi to undertake biodiversity/pest monitoring and controlling pest species to support the wider Predator Free Mataroa Kaupapa. It will continue to develop and improve education and employment opportunities for hapu and continue the focus on kaitiakitanga for te taiao of Ngāti Rehia.

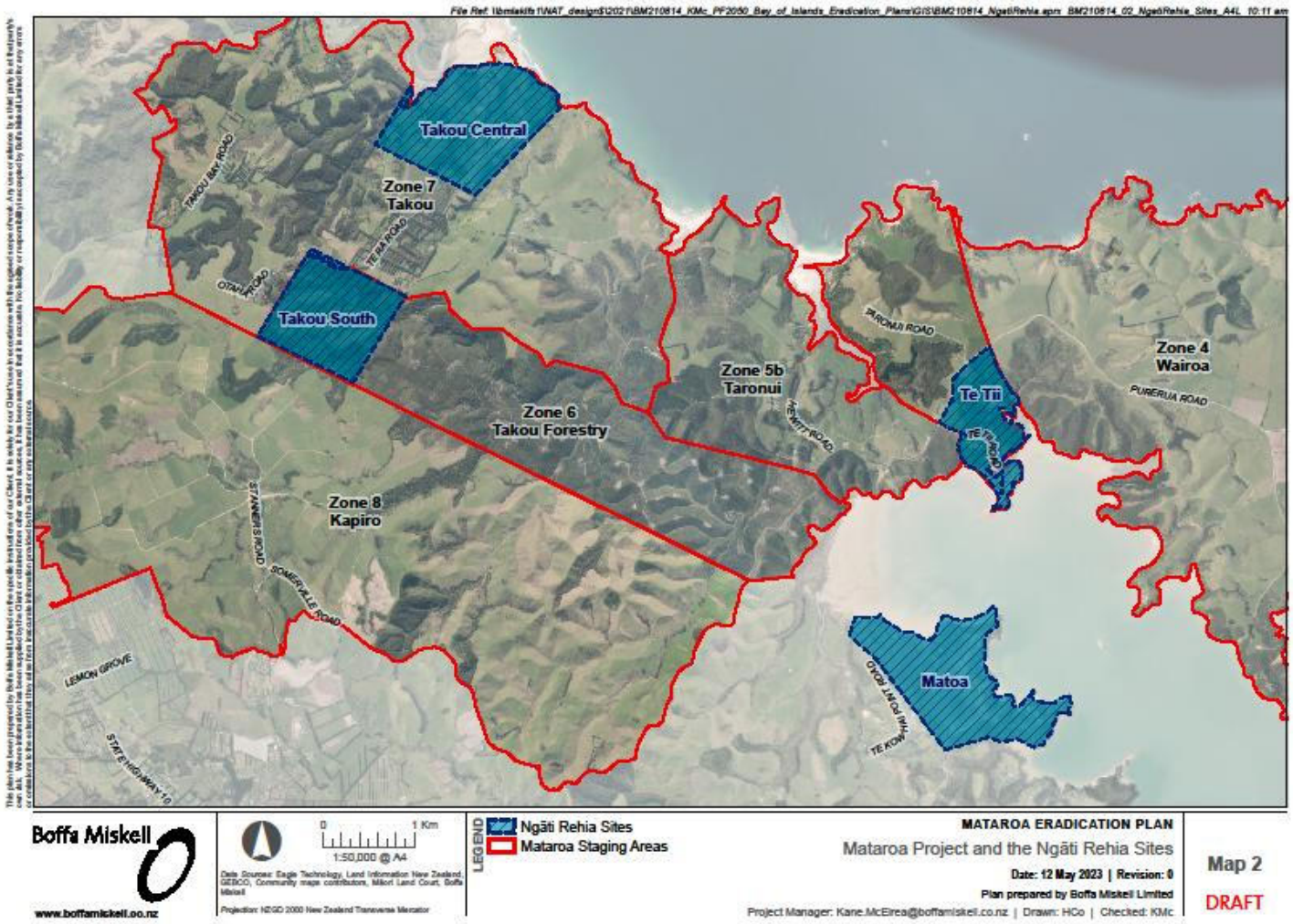
Gathering initial baseline data will help guide future biodiversity outcome management activities for Ngati Rehia. Clearly understanding what biodiversity values already exist within Ngāti Rehia whenua Māori and at what levels, as well as what biodiversity is missing will drive future planning and management practices to restore biodiversity.

It is envisaged that this mahi will build upon and partner alongside the many years of restoration led by the Kiwi Coast Trust and further increasing the tangible gains already made. This project

MAP 1: Overview of Mataroa pest eradication plan with Ngāti Rehia whenua Māori sites:



MAP 2: Overview of Ngāti Rehia whenua Māori sites



will also provide sustainable jobs as well as skill development, empowerment, and the greater wellbeing of Ngāti Rehia tangata whenua.

1.3 Ngā Ūara - Biodiversity values

The rohe o Ngāti Rehia has high biodiversity values and is home to several At Risk and Threatened native bird populations occupying a range of habitats throughout the rohe. The Purerua peninsula and surrounding area has some of the highest numbers of North Island brown kiwi (*Apteryx mantelli*) recorded in Northland. There are several large wetlands which are important habitats for spotless crake (*Zapornia tabuensis*), Australasian bittern (*Botaurus poiciloptilus*) and fernbird (*Megalurus punctatus*).

Pāteke (*Anas chlorotis*) were released on the Purerua peninsula between 2011 and 2023 to re-establish a permanent population on the peninsula. The coastal habitats and rocky shore of the Purerua peninsula, as well as surrounding islands provide nesting habitat for little blue penguins (*Eudyptula minor)* and petrel species have also historically used the coastal cliffs and nearby offshore islands to nest.

Due to the close proximity of the Purerua peninsula to nearby pest free Islands of Ipipiri, there is an increased likelihood that species reintroduced to these islands such as kakariki (*Cyanoramphus novazelandiea)* and korimako (*Anthornis melanura*) may self-introduce back to the mainland.

1.4 Ngā Whāinga - Project objectives

This project will primarily focus on biodiversity restoration and pest control on Māori owned whenua within the Predator Free Mataroa project area and the Ngāti Rehia rohe. The work on these sites will be led by Ngāti Rehia alongside project partners to control possums, feral cats, mustelids and rats on whenua Māori.

This plan outlines operational requirements, implementation process and schedules to undertake the elimination and suppression of predators from whenua Māori sites within the project area.

Ngāti Rehia objectives

This implementation plan and its delivery aims to provide Te Runanga o Ngati Rehia with a positive project of restoration, reconnection, skill development, employment, education, and a better understanding of how indigenous environmental knowledge can be utilised to positive effect.

Mātauranga Māori objectives:

It is envisaged that throughout this project, activities will integrate and utilise mātauranga Māori practices, knowledge and guidance led by Ngāti Rehia hapu as mana whenua, the degree to which mātauranga Māori practices are utilised within this project will be determined by Ngāti Rehia hapu.

Some mātauranga Māori practices may include:

- Using karakia before and after entering the ngahere and to start work each day.
- Utilising the maramataka to plan operational timings.

- Communications with whanau about their local knowledge of the area as well as local trappers.
- Observations of key species such as flowering or fruiting trees

Biodiversity and Pest Control Objectives

- To manage the impacts of introduced pest/predator mammalian species on Māori Whenua
- To restore and enhance the native flora and fauna on Māori Whenua
- To support tangata whenua to be actively involved in protecting the whenua from predators.
- To educate whanau on understanding, caring and responsible ownership of cats and dogs.
- To develop new employment opportunities for Ngāti Rehia hapu
- To work alongside, and involve local schools, day-care and kura in restoration activities.
- To build a biodiversity workforce who are skilled and connected to the land, to undertake pest eradication, to support the restoration and enhancement of the taiao
- To implement a better understanding on how indigenous environmental knowledge can underpin hapu/ iwi conservation work.

Implementation plan objectives

Table 1: The following table outlines the native biodiversity species known to inhabit or visit the region in which the whenua Māori blocks are located (as identified by Ngāti Rehia hapu). The table also outlines the objective for native species over the lifespan of this plan.

Native biodiversity outcome objectives:	
Biodiversity species (as identified by Ngāti Rehia hapu)	**Objectives**
North Island saddleback Dotterels North Island fernbird Kingfisher Kiwi Weka Petrel Pateke Blue Penguin Pekapeka (NZ Bat) Invertebrates Reptiles Freshwater species Tree species	For the lifespan of this plan - Any native biodiversity species monitored will not reduce in residual annual average abundance, based on baseline monitoring indices. Future objectives could also focus on realistic increases in native species' abundance and be set at that time.

Table 2: The following table outlines the target pest species of this plan, the desired control objectives for each area, and the target pest density after control implementation.

Target pest species objectives:			
Focus Whenua Māori areas	**Target species**	**Objectives**	**Target pest density**
Te Tii	possums feral cats mustelids rats	*Elimination (Possums)* *Suppression – (feral cats, mustelids, rats).*	<1% <5% <5% <5%
Takou Blocks	possum feral cats mustelids rats	Suppression- (all species)	<10% <10% <10% <10%
Matoa	possum feral cats mustelids rats	Suppression- (all species)	<10% <10% <10% <10%

1.5 Whenua Māori project areas

The four whenua Māori sites identified in this plan are owned by multiple owners and managed by different organisations such as Māori land trusts on behalf of the owners. The target species and control objectives for each area may vary slightly depending on the native and pest mammal species present and the location of each area in relation the objectives of the Predator Free Mataroa plan. Maps 3 and 4 detail proposed trapping networks for each area and are described further in section 4.0.

Te Tii rohe (88ha)

The whenua Māori area of Te Tii (Map 4) is a mixture of native forest, manuka/kanuka shrub, mangrove forest and residential built-up area. There are multiple landowners and trustees involved in the Te Tii rohe. As this area is located at the neck of the Purerua peninsula, this will be the primary pathway for reinvasion of pests from the mainland on to the peninsula.

The Te Tii rohe, in particular forms a key component of the Predator Free Mataroa eradication programme as it forms part of an intensive buffer zone which aims to prevent target species from reinvading the rest of the Purerua peninsula (Refer to Map 2).

The objective in this whenua Māori area will be to eliminate possums and suppress other target pests to very low levels and create an effective ‘barrier’ network of traps and bait stations that can defend against reinvading pests, fulfilling its function as a buffer zone while also providing ecological benefits.

Once possums have been reduced to low densities in Te Tii, the efforts can shift to continually preventing possums and other pests migrating through the Te Tii rohe and reinvading the Purerua peninsula. This will be more important in later years when elimination of possums and other pests is achieved on the entire Purerua peninsula.

Takou Central (172ha) and Takou South (128ha)

The entire area of the whenua Māori sections of Takou Central and Takou South (Map 3) is vegetated with a mixture of exotic shrubland, manuka/kanuka shrub and broadleaved indigenous hardwoods. This area is within the suppression zone, which aims to control possums, feral cats, mustelids and rats to low levels (<5%) throughout the lifespan of this plan.

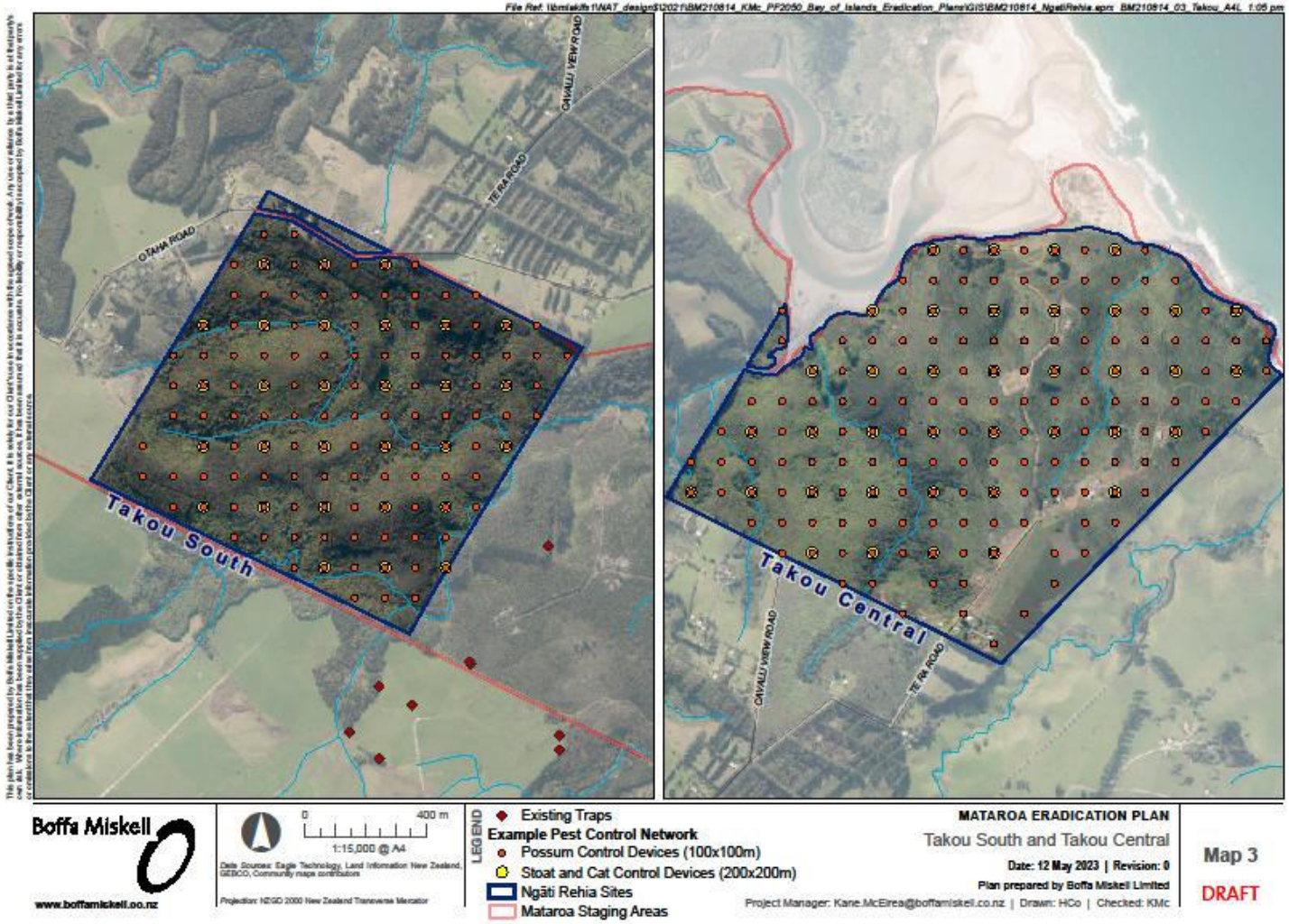
The suppression of t possums, feral cats, mustelids and rats to low levels within Takou Central and Takou South will put less reinvasion pressure on the buffer zone in Tapuaetahi/Taronui (Map 2) which is acting to defend reinvasion into the greater Purerua peninsula. Additionally, the suppression of pests in Takou Central and Takou South will benefit the biodiversity in this area by reducing predator impact on native species populations here.

Matoa Rohe (197ha)

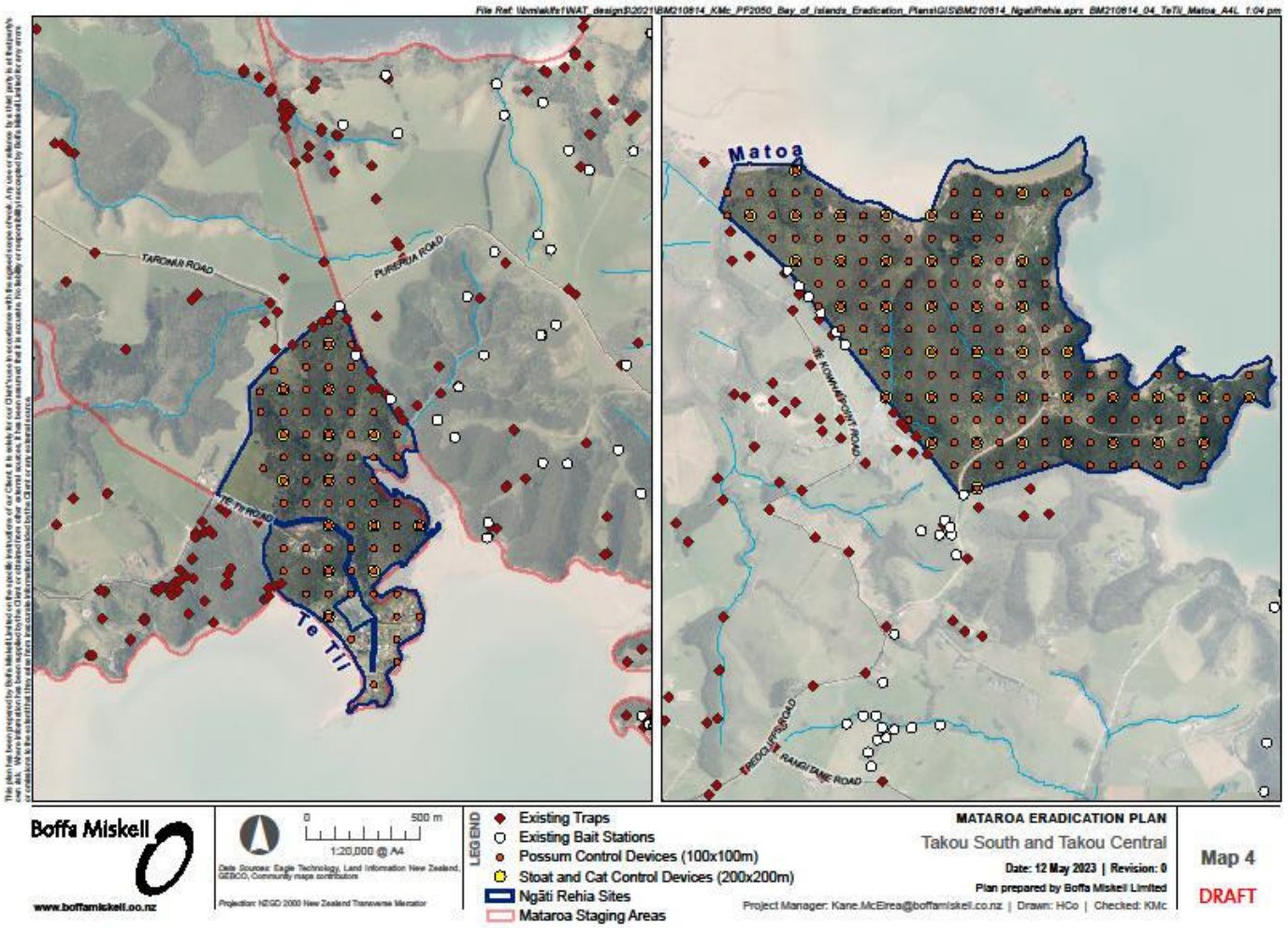
The Matoa Rohe (MAP 4) is a mixture of farmland and manuka/kanuka shrub. This area is outside of the Predator Free Mataroa Project area (Map 2); however work will be undertaken here to suppress target pests to low levels (<5%) throughout the lifespan of this plan.

Similar to Takou Central and South, the control of target pest species within Matoa will result in less reinvasion pressure from these species on the buffer zone which is acting to intercept reinvading target pest species into the greater Purerua peninsula. This will also benefit the biodiversity in the area by reducing predator impact on native species populations.

MAP 3: Detailed device layout overview of Takou South and Takou Central whenua Māori sites.



MAP 4: Detailed device layout overview of Te Tii and Matoa whenua Māori sites



1.6 He Kawenga - Roles and responsibilities

Mana whenua will be working closely with whanau as well as Kiwi Coast to implement this plan. Some of the roles for implementation of this plan will include, hapu engagement, project coordination, trapping and reporting. There is also potential for whanau volunteers, which will include residents from varying age groups.

The work will have a collaborative approach with people undertaking multiple roles at times. Therefore, roles may evolve as the project aims to build capabilities and create job opportunities throughout the lifespan of this project.

Roles identified for the Ngāti Rehia implementation plan may include:

- Te Taiao lead, project coordinator
- Hapu/whanau representatives
- Predator/pest control contractor(s)
- Pest/biodiversity monitoring contractor(s)
- Communications/engagement
- GIS support
- Administrative support

1.7 Hapu engagement

Before any work is undertaken, an initial hui will be held with mana whenua, whanau, landowners, trustees and others involved with this project.

The Taiao lead will engage Te Runanga o Ngāti Rehia on the hapu objectives of this project and communicate the ongoing work to ensure whanau / landowners know what the kaupapa is all about. Describing the aims of PF2050 Mataroa, the benefits to whanau, the ideas for delivery that should feature, and help inform the final implementation plan. The hui will also act to give guidance to stakeholders to effectively undertake the work involved and achieve the objectives set. Implementation of mātauranga Māori practices should be discussed during the initial hui for the activities involved in the project.

Following an initial hui, the Taiao lead will seek permission from relevant landowners to undertake the planned work. A pre-start meeting will be held prior to laying out the traps and starting the groundwork. This will include a Health & safety briefing.

2.0 Target species and impacts

Understanding how target pest animals behave, their population dynamics and their ecology is crucial to ensure control measures are able to target each species and reduce the impacts these species have on native species (Table 3).

Table 3: A list of the key target pest species of this plan and their distinct behavioural, distribution, breeding and feeding attributes:

Possums (*Trichosurus vulpecula*)	Preferred possum habitats are native forest and scrub. Possums heavily browse on native vegetation and can eat bird eggs, chicks and invertebrates, negatively impacting the ecosystem. Home ranges of females are between 0.6 and 2.7 ha, while that of males are between 0.7 and 3.4 ha.
Rats (*Rattus spp.*)	Both Ship Rat (*Rattus rattus*) and Norway rats (*Rattus norvegicus*) feed on native vegetation, especially seeds in mast events, negatively impacting forest health. They are known predators of invertebrates, herpetofauna, and native bird eggs, chicks, fledglings and adults and have caused several population losses and contributed to the extinction of some native species. Ship rats occupy a home range of approximately 0.3-11.4 ha in size while Norway rats occupy larger home ranges of approximately 0.8-21 ha in size.
Dogs (*Canis lupus familiaris*)	Roaming dogs can pose a serious predation and disturbance threat to native New Zealand fauna, especially uncontrolled dogs that are allowed to roam. All dogs have the potential to kill most native fauna species including large birds such as kiwi (*Apteryx spp.*). Most native species are at serious risk from uncontrolled dogs without any defence mechanisms to fight back or hide from their powerful predatory capabilities.
Feral cats (*Felis catus*)	Feral cats are one of the most successful predators in Aotearoa. They are capable of predating on adult kiwi, as well as their eggs and chicks. Their diet typically consists of small mammals such as rabbits, hares and rodents, birds and their eggs, and, to a lesser extent, lizards and invertebrates. Feral cats are usually solitary and sparsely distributed, with measured home ranges in excess of 200 ha impacting native species across a wide landscape.
Mustelids	Stoats (*Mustela erminea*) are the most common and destructive mustelid in New Zealand. Stoats are found in all ecosystems, and breed once a year, however, can produce up to ten young per litter, multiplying to uncontrollable levels quickly. They seriously impact native avifauna, especially ground dwelling birds, such as kiwi. Ferrets (*Mustela furo*) inhabit more open areas such as coastal habitats, pastoral lands and forest margins, consuming a diet predominantly of rabbits and hares. Ferrets can produce up to two litters per season. Like weasels and stoats, ferrets can cause devastating impacts to native wildlife populations and have large home ranges meaning that they can disperse to new accessible areas relatively easily. Weasels (*Mustela nivalis*) can easily be displaced by stoats and because of this, are present in most New Zealand ecosystems, but not all, in low numbers. Even at low densities, weasels are known to impact native wildlife, including invertebrates, herpetofauna, and birds. They produce two to three litters a season, with four to six young per litter.
Hedgehogs (*Erinaceus europaeus*)	Hedgehogs have devastating impacts on a range of native wildlife, particularly ground nesting birds as they prey upon their chicks and eggs. Hedgehogs also have a voracious appetite for invertebrates, significantly impacting native slug, snail, and insect populations. They have a large distribution within many habitats and are rarely victims of predation by other introduced mammals.

3.0 Monitoring (baseline and ongoing)

Monitoring of the target pest species and native biodiversity will be the first step prior to implementing the predator control network within the Whenua Māori areas. The outcome of the monitoring will then be used to inform the intensity and diversity of control required with specific information on localised pest densities. Throughout the project it will also be vital for Ngāti Rehia and partners to monitor the ongoing pest/predator and biodiversity responses to control activities and the associated outcomes.

The Ngāti Rehia whenua Māori sites identified in this plan range from 88 ha (Te Tii) to 197 ha (Matoa) and are mostly covered in native vegetation, with some wetland and coastal margins, farmland and residential properties. Therefore, monitoring will need to be of scale to cover the home range and habitats of the target species over the whenua, with frequent ongoing checks to detect any incursions of pest species and the impact on residual animals throughout the operation.

Monitoring will utilise standardised protocols and guidelines for key target species within all Whenua Māori areas of this plan. Ongoing monitoring of pest/predators and native biodiversity should be conducted to gather valuable data for managers in relation to the success of the programme, and if adaptive management is required.

Additional monitoring may be required in the Te Tii block to align with the Predator Free Mataroa detection and response phase monitoring once this has been agreed or developed by Kiwi Coast and project partners.

3.1.1 Native biodiversity monitoring

Table 4: An overview of the native biodiversity monitoring methods, guidelines, distribution of devices/stations/transects and the desired frequency/timing of each monitoring activity.

Target Species	**Monitoring Method** **Guidelines/Protocols (Links)**	**Distribution**	**Frequency / Timing**
Forest Birds	5 Minute Bird Count Five Minute Bird Count	Listening stations spaced 200m apart along lines within forested habitat. Up to 10 stations per line.	Four times per year during the middle of each season for the first year, then same frequency annually ongoing. Imperative to use same people, locations and timing. (Summer/autumn/winter/spring)
Kiwi	Directional call counts Kiwi Best Practice Manual	Two listening sites per area, spaced at least 500 m apart.	Once per annum during the national Kiwi Call Scheme period (contact Kiwi Coast or DOC for date). Counts are 2 hrs over 4 calm nights at the same site by the same people. Conduct surveys annually ongoing.
Forest Birds, Kiwi, Seabirds, Bats	Acoustic Recording Devices (ARDs) Acoustic Recording Device Guide	3 ARDs per line, spaced 400 m apart. Two lines per zone in suitable habitat by species. Share ARDs between sites	Forest birds - record Dawn and dusk for 2 hours, over 7 nights in December. Kiwi - record 2 hours after sunset for 2 hours, for 7 nights during kiwi call count period (June/July). Bats - record 2 hours after sunset for 2 hours, for 7 nights between October and March Seabirds - record for 2 hours after sunset, for 7 nights during prospecting season by species. Conduct annually at same time periods ongoing.
Geckos	Spotlight survey Gecko Survey Guide	One transect per area in suitable habitat. Each transect 200 m in length.	Check in Late Jan/Early Feb in first year for baseline, and then in the same period annually.

3.1.2 Predator and Pest Monitoring

Table 5: An outline of the predator and pest monitoring methods, guidelines, distribution of devices/stations/transects and the desired frequency/timing of each monitoring activity.

Target Species	**Monitoring Method** **Guidelines/Protocols (Links)**	**Distribution**	**Frequency / timing**
Rats	Residual rodent tracking (Tracking Tunnels) Tracking Tunnel Guide	10 tunnels per line, tunnels 50 m apart; 200 m between lines. Up to 6 lines per area	If required complete annually, One night monitor Tunnels remain in-situ for ongoing monitoring, to reduce neophobic behaviour of target species.
Possums	Bite Mark Index (Chew Cards or Wax Tags) Possum Population Monitoring	10 cards/tags per line 20 m apart. 200m between lines. Up to 6 lines Or 1 device per ha as per Predator Free Mataroa protocol (TBC)	Seven-night monitor. Cards removed at end of survey for analysis.
Possum, Rats, Feral Cats, Mustelids	Trail Camera paired with Auto lure device Predator Detect using Camera Guide	Lines of 4 cameras 200 m apart along a camera trap line or One camera per 12.5 ha in a grid in suitable habitat.	Cameras and ALDs are checked monthly, SD cards replaced, and data analysed using software such as ZIP's classifier. Metadata can then be interpreted by managers.

4.0 Pest and Predator Control

4.1 Target Species Control Options

The control methods discussed in this section refer to the control of 'predators' as defined by this plan – namely possums, rats, dogs, feral cats, mustelids, (and hedgehogs as a by-product of rat and mustelid control). There are many options for controlling these animals and a diverse range of control methods must be considered to ensure predator control is fit for purpose and efficient. Utilising various methods simultaneously will improve the success of control as it targets individuals with different behavioural preferences.

Both trap and toxin options recommended by this predator control implementation plan are outlined in this section. Their direct application to the project is described in Table 6 below, and Table 7 provides the detailed operational methodologies required of each control option.

Table 6: Control method/s employed for each species within this predator control plan.

Target Species	**Control Method/s**
Possum	Vertebrate toxic agents/kill traps
Ship Rat	Vertebrate toxic agents/kill traps
Norway Rat	Vertebrate toxic agents/kill traps
Dogs	Engagement
Feral Cats	Vertebrate toxic agents/live trapping
Mustelids	Vertebrate toxic agents/kill traps
Hedgehog	Kill trapping

4.2 Predator Trapping

Trapping is a very effective way of targeting species across the landscape. There are many factors that need to be considered to create an efficient trapping network, such as the behaviour of the target predator, efficacy of the trap, the type of habitat and landscape that is being trapped, and the labour capacity and skills. Trapping needs to be a dynamic process whereby predators are monitored over time and trapping efforts amended to reflect any changes to predator populations.

The recommended pest/predator control trap types for this elimination and suppression programme are described in the sections below, including the required distribution, frequency of checks, lure required and other key considerations.

Table 7: Predator/Pest control implementation guidelines including devices and specific guidelines/protocols, distribution of control devices, frequency of checks, lures required and other important considerations. This table will form a practical template upon which the operational team will be able to effectively deliver this control programme. The number of devices required has been accounted for in the equipment/devices required Table 5.0

Target Species	**Control device and guidelines**	**Distribution**	**Frequency**	**Lure** (Switch out lures based on seasonality food sources).	**Other considerations**
Possum, rats,	AT220 Predator Free 2050 – A practical guide to trapping	Traps placed on boundary lines One trap every ha Purchase only 20 in year 1 for trial	Traps checked monthly (to ensure its working correctly)	Auto Self-luring for 4-6months (one bottle comes with trap). Blaze on ramp	Wooden ramp access Place trap at height above pigs/cattle reach.
Feral Cats	Live Cage trap FERAL AND STRAY CATS	In urban areas or integrated into easily accessible trap lines. (Integrated with DOC200 trap line locations & spacing) approx. 1 per 10 ha	Trap check - Requires daily checks. Suggest setting for one night once per week in easy access areas (e.g. roadsides, clearing edges, path edges).	Large fresh rabbit with fur on and or chunks off fish.	Hessian sack on roof of cage trap to provide shelter from heat and dehydration. Avoid open areas, especially in summer. Must be checked within 12 hours of daylight. Also need to consider disposal options.
Possum, feral cats	SA2 Kat trap or Sentinel Predator Free 2050 – A practical guide to trapping	One trap every 100m along control lines 100m apart. Approx 1 per ha. Boundary lines may one trap every 50 m.	Trap check weekly on boundaries. Trap checks fortnightly on all other traps	Fresh rabbit for feral cats plus either: Smooth in a tube (possums) Peanut Butter and cat biscuits (Fish flavoured). Poa uku (Mustelid) can be laced through back of trap. ALD (egg mayo) option	Wooden ramp access Could add ALD into back of SA2 Drill holes in wooden base plate for applying soft lures Change lure depending on target species
Stoat Weasel	DOC200 double-set Predator Free 2050 – A practical guide to trapping	One trap every 200 m along control lines 200 m apart.	Trap check weekly on boundaries. Trap checks fortnightly on all other traps	Salted rabbit (preferred option) Hen eggs (preferably uncleaned) during winter months Poa uku long life lure (mustelid). Connovation Eggselllent ALD (egg mayo) Connovation Lure it Salmon on trails between traps	Calibration - every 6 months Has potential to also capture Hedgehogs, Norway rats, Ship rats
Ferret	DOC250 single set Predator Free 2050 – A practical guide to trapping	One trap every 200 m along control lines 200 m apart. Or 1 per 10 ha. (Integrated with DOC200 and Feral Cat live cage trap line locations & spacing).	Trap check weekly on boundaries. Trap checks fortnightly on all other traps	Salted rabbit (preferred option) Hen eggs (preferably uncleaned) during winter months Poa uku long life lure (mustelid). Connovation Eggselllent ALD (egg mayo) Connovation Lure it Salmon on trails between traps	Calibration - every 6 months Can add ALD to roof of trap.
Norway rat Ship rat	T rex trap. D-Rat trap I & M Toolbox - Animal pests - DOC snap trap guide v1.3	Every 50 m along lines 100 m apart. Can be located at same site as toxin bait station but separated by at least 2 m.	Trap check weekly on boundaries. Trap checks fortnightly on all other traps	Peanut Butter White chocolate buttons PCR Rat and Possum lure Connovation Erayz Connovation Eggsellent	Wooden cover box on t Rex trap.

4.3 Vertebrate Toxin Agents (VTAs)

Table 8 lists different toxins that could be used for predator control within the Project.

The use of toxin is generally considered the most efficient and cost-effective method for controlling a range of mammalian pests compared to trapping. Practitioners must strictly follow all best practices, protocols and manufacturers recommendations when using vertebrate toxin agents (VTAs) to control pests. These can be found in the product labels and safety data sheets for each toxin which must be kept on accessible record for all those purchasing, transporting, storing, applying, and disposing of toxins.

Notifying all stakeholders prior to toxin operations is advised, and supplying the appropriate signage at all main entrances to sites is a compulsory activity.

It is vital in all toxin control operations that enough toxin to induce a lethal dosage per target species is always available, failure to follow this important protocol could lead to sub-lethal dosages resulting in toxin shy pests and the need for more toxic options, or other less efficient control options. Alternating toxin type availability through the switching out of toxins at planned intervals, or as triggered through exceeding target index thresholds, is also highly recommended to reduce the chance of toxin shyness in the target animals.

It is highly recommended that managers/supervisors/contractors of this project attain an approved handler's certificate for vertebrate toxins (or hold a current certificate), as well as any required Controlled Substance Licences (CSL).

The table below describes several well-known and commonly utilised vertebrate toxic agents for these types of operations, the pest species that each toxin is registered for f, and the general methodology required for each.

Table 8: List of recommended toxins and the key targets animals, descriptions of each toxin, quantities required and timing of each stage:

Toxin and guidelines	Target species	Description	Quantity of Toxin required (Per station).			Timing of toxin pulses and/or top ups
			Pre- feed	Knockdown or Switch out pulse	Ongoing	
Pestoff (0.02g/kg Brodifacoum) Pest off Guide	Possum, Rats	2nd Generation anticoagulant toxin, secondary toxin transfer potential (targets and non-targets). High risk of accidental poisoning to roaming dogs. Very effective in secondary removal of mustelids and feral cats.	Not Required	**Knockdown** – 250 g per station, per pulse.	n/a	**Weeks 1 – 8** **Pre-feed** weekly for 2 weeks (2 pulses). **Knockdown** – weekly for 6 weeks (6 pulses). Remove all toxin at end of knockdown. **Detection response** - If detection indicates reinvasion/residual population increase = knockdown in affected area to be repeated.
Pindone Pellets (0.05g/kg Pindone) Pindone Guide	Possum and Rats	1st Generation anticoagulant. Low risk of secondary poisoning to dogs. Low risk to non-targets and native wildlife. Antidote - Vitamin K. Very effective on rats, less effective on mice.	n/a	n/a	200gms (in clear tied plastic freezer bag).	**Week 9 onward** (Or earlier if uptake drops significantly prior). **Ongoing** – Monthly top ups.
Double Tap (0.05g/kg Diphacinone & 0.60g/kg Cholecalciferol) Double Tap Guide	Possum and Rats	1st Generation anticoagulant diphacinone and cholecalciferol (a non-anticoagulant toxin). Low secondary poisoning risk to non-targets. Effective toxin to switch out with Pindone after 12 months to reduce toxin shyness. One 6-8 week pulse.	336 g per station (24x12gm pellets).	**Switch out pulse** – 336 g per station (12x28 g blocks). One off toxin round.	n/a	**Every 12months** Remove any other toxins from stations. **Prefeed** – weekly for 2 weeks (2 pulses). **Switch out pulse** – DT toxin in all stations, leave out for 6-8 weeks then remove. Return to ongoing toxin control if monitoring indicates residual abundance below desired thresholds.
Feratox 475g/kg Potassium cyanide (120mg Pc per pellet) Feratox Guide	Possum	Controlled Substance Licence (CSL) required. Low secondary poisoning risk to other targets and non-targets. Very effective at removing possums quickly, so they consume less of the other toxins.	If desired - Ferafeed paste in bait station or on tree/post where Feratox bio bag will be placed.	**Knockdown option** – of possums prior to other toxins being used. 5 pellets per station or 1 per bio bags per tree/post (at height above non target reach – Pig/dog).	n/a	Prior to other toxin control to remove large toxin uptake threat posed by moderate to high possum abundance.
Feracol 8g/kg Cholecalciferol (Vitamin D3) Feracol Guide	Possum and Rat	Cholecalciferol also known as Vitamin D3. Low secondary poisoning risk to non-targets. Another effective toxin option for switch out or mop-up if reinvasion spikes occur.	n/a	**Switch out Pulse/Mop up –** 200 grams per bait station	n/a	**Every 12months or if detection dictates mop up pulse** Remove any other toxins from stations. **Switch out/mop up pulse** – Feracol toxin in all stations, leave out for 6-8 weeks then remove. Return to ongoing toxin control if monitoring indicates residual abundance below desired thresholds.

5.0 Equipment/Devices required.

The following table lists the recommended devices required for each whenua Māori site to achieve the necessary density of control equipment to meet the elimination and suppression targets and objectives of this plan. This list can be used to order necessary equipment and help maintain a stocktake of devices in each area.

Table 9: Recommended equipment for the monitoring and control of target species within the whenua Māori project areas.

Monitoring Equipment	**Takau Central**	**Takau South**	**Te Tii**	**Matoa**	**Total**
Trail Cameras	12	10	6	13	**42**
Automatic lure device	12	10	6	13	**42**
Acoustic Recording Device	6	6	6	6	**24**
Tracking tunnels	60	60	30	60	**210**
Chew cards	154	127	76	168	**524**
Wax tags	154	127	76	168	**524**
Control Equipment					
Bait Stations	154	127	76	168	**525**
Possum traps	154	127	76	168	**525**
Stoat traps-Doc200	15	13	8	17	**53**
Cat traps- SA2 / Live	15	13	8	17	**53**
Bait-Pest Off-Knockdown	154	127	76	168	**525**
AT220 trial traps			20		**20**
Lures for possum traps	154	127	76	168	**525**

Where possible Trail cameras Acoustic Recording Devices and Automatic lure devices should be shared between sites, this will be dependent on the timing of monitoring and control of target species at each site

6.0 He Whakaritenga - Implementation Schedule

Table 10: The following schedule is provided as a to guide the operations team in the implementation stages for each area of Ngāti Rehia whenua. These tables should be used in conjunction with tables 4,5,7,8 & 9 to help manage the successful operation of this project. Environmental, financial, social and seasonal factors out of the control of the operations team may alter the timing of this schedule and adaptive management practices will need to utilised to overcome such variables. Further engagement with landowners and hapu will be required prior to implementation.

Project Management - All Areas																		
Category	**Activity**	**Species**	**23-May**	**23-Jun**	**23-Jul**	**23-Aug**	**23-Sep**	**23-Oct**	**23-Nov**	**23-Dec**	**24-Jan**	**24-Feb**	**24-Mar**	**24-Apr**	**24-May**	**24-Jun**	**24-Jul**	**24-Aug**
Training																		
Reporting	To NRC and JFN - quarterly and monthly																	

Te Tii																		
Category	**Activity**	**Species**	**23-May**	**23-Jun**	**23-Jul**	**23-Aug**	**23-Sep**	**23-Oct**	**23-Nov**	**23-Dec**	**24-Jan**	**24-Feb**	**24-Mar**	**24-Apr**	**24-May**	**24-Jun**	**24-Jul**	**24-Aug**
Landowner engagement	Hui/conversations with Landowners																	
Baseline Monitoring - Biodiversity	Five Minute Bird Counts																	
	Directional kiwi call counts																	
	Acoustic bird recording	Forest Birds																
		Kiwi																
		Seabirds																
	Lizard spotlight surveying																	
Baseline Monitoring – Pest/predators	Residual rodent tracking																	
	Bite mark Index																	
	Camera Trap Index																	
Pest/Predator Control - Trapping	Kill traps																	
	Live Cage traps																	
Pest/Predator Control - Toxin	Ground Based toxin control in bait stations																	

Takou Central																		
Category	**Activity**	**Species**	**23-May**	**23-Jun**	**23-Jul**	**23-Aug**	**23-Sep**	**23-Oct**	**23-Nov**	**23-Dec**	**24-Jan**	**24-Feb**	**24-Mar**	**24-Apr**	**24-May**	**24-Jun**	**24-Jul**	**24-Aug**
Landowner engagement	Hui/conversations with Landowners																	
Baseline Monitoring - Biodiversity	Five Minute Bird Counts																	
	Directional kiwi call counts																	
	Acoustic bird recording	Forest Birds																
		Kiwi																
		Seabirds																
	Lizard spotlight surveying																	
Baseline Monitoring – Pest/predators	Residual rodent tracking																	
	Bite mark Index																	
	Camera Trap Index																	
Pest/Predator Control - Trapping	Kill traps																	
	Live Cage traps																	
Pest/Predator Control - Toxin	Ground Based toxin control in bait stations																	

KEY				
Baselines/Install/Initial hui/training relating to each specific activity	Ongoing Monitor/Control/engagement/reporting	Toxin Knockdown Period - weekly top ups	Ongoing toxin - monthly top ups	Alternating toxin pulse - single pulse

Takou South																		
Category	**Activity**	**Species**	**23-May**	**23-Jun**	**23-Jul**	**23-Aug**	**23-Sep**	**23-Oct**	**23-Nov**	**23-Dec**	**24-Jan**	**24-Feb**	**24-Mar**	**24-Apr**	**24-May**	**24-Jun**	**24-Jul**	**24-Aug**
Landowner engagement	Hui/conversations with Landowners																	
Baseline Monitoring - Biodiversity	Five Minute Bird Counts																	
	Directional kiwi call counts																	
	Acoustic bird recording	Forest Birds																
		Kiwi																
		Seabirds																
	Lizard spotlight surveying																	
Baseline Monitoring – Pest/predators	Residual rodent tracking																	
	Bite mark Index																	
	Camera Trap Index																	
Pest/Predator Control - Trapping	Kill traps																	
	Live Cage traps																	
Pest/Predator Control - Toxin	Ground Based toxin control in bait stations																	

Matoa																		
Category	**Activity**	**Species**	**23-May**	**23-Jun**	**23-Jul**	**23-Aug**	**23-Sep**	**23-Oct**	**23-Nov**	**23-Dec**	**24-Jan**	**24-Feb**	**24-Mar**	**24-Apr**	**24-May**	**24-Jun**	**24-Jul**	**24-Aug**
Landowner engagement	Hui/conversations with Landowners																	
Baseline Monitoring - Biodiversity	Five Minute Bird Counts																	
	Directional kiwi call counts																	
	Acoustic bird recording	Forest Birds																
		Kiwi																
		Seabirds																
	Lizard spotlight surveying																	
Baseline Monitoring – Pest/predators	Residual rodent tracking																	
	Bite mark Index																	
	Camera Trap Index																	
Pest/Predator Control - Trapping	Kill traps																	
	Live Cage traps																	
Pest/Predator Control - Toxin	Ground Based toxin control in bait stations																	

KEY

Baselines/Install/Initial hui/training relating to each specific activity	Ongoing Monitor/Control/engagement/reporting	Toxin Knockdown Period - weekly top ups	Ongoing toxin - monthly top ups	Alternating toxin pulse - single pulse

7.0 Project Costings

The development of costings for this project were determined by the specific pest control thresholds desired for each specific whenua Māori area within the Ngāti Rehia rohe. The varying levels of control and monitoring for each area have dictated the estimated costs and are based on current equipment and labour costs derived from industry and hapu information.

This pest/predator control implementation plan and the prescribed operational activities are an **indicative guideline** that can be implemented in a staged process across whenua Māori that suits Ngāti Rehia hapu. It is important however that once initiated, certain activities need to follow the recommended timings such as toxin rebaiting, number of monitoring nights and live cage trap checks due to animal ethics and best practice protocols/requirements.

An estimated operation budget has been developed for each whenua Māori area and has been used to provide the estimated costings below. The following costing is based on an annual programme of works for the control of target species within the four whenua Māori project areas for one year, with pre and post monitoring.

Table11: Estimated cost of equipment and labour for the first 12 months for the implementation of monitoring and control of target species within Ngāti Rehia whenua Māori project areas.

Whenua Māori project area	Estimated cost - equipment	Estimated cost - labour	Estimated cost - total
Te Tii	$31,571.80	$38,131.67	**$69,703.47**
Takou Central	$30,184.30	$17,989.17	**$48,173.47**
Takou South	$21,114.15	$17,179.17	**$38,293.32**
Matoa	$33,761.80	$22,734.17	**$56,495.97**
TOTAL	**$116,632.05**	**$96,034.17**	**$212,666.22**

8.0 Data Management

The capture and recording of data collected during this project are of vital importance to determining the ongoing efficacy of pest control in terms of pest numbers and the relative abundance of native species being monitored.

It is highly recommended that the Project be set up in Trap.NZ and all predator control data (trap catch data and toxin information) and monitoring data be entered into the database at each check.

Trap.NZ is an online database that is free to use within New Zealand. Trap.NZ is the most commonly used database by both professional and community-based predator control projects throughout New Zealand. Once a project is set up, it is used to record data relating to the following:

- Trap networks (trap type, location, bait / lure type, predators caught, etc);
- Bait station networks (bait station type, location, toxin type, etc); and
- Monitoring (monitoring tool, location, predators identified etc).
- Points of interest (can be used for locations of native species value areas, or signage locations, etc).

Once data is entered into Trap.NZ, managers of a project can access valuable information pertaining to the success of the control operation. Reports can be produced with visual mapping of catch data locations and hot spots, at a chosen time or over a longer time period. This data empowers managers to make informed decisions about the control programme and if any adaptive management changes are necessary.

9.0 He Arotake - Review implementation and Reporting

It is recommended that this implementation plan is reviewed annually by te taiao lead/project coordinator, and an annual plan is developed that reports upon the objectives and outcomes.

The annual implementation review should also include budget tracking data, as well as any further key learnings, necessary programme changes made, and challenges/risks faced over each 12-month period.

The recommended annual implementation review and associated report(s) should be shared with all key stakeholders of this project, especially hapu and whanau members.

It is also imperative that te taiao lead and other key personnel regularly utlilise monitoring data throughout the implementation process, to guide adaptive management decisions and further project knowled

Whenua Plan

Tapuaetahi Incorporation - Te Tii

Prepared By: Ian Hanmore & Mitchel Hanmore

February 2024

Hanmore
Land Management

TABLE OF CONTENTS

1.0 INTRODUCTION

This Environment Plan (EP) has been completed as part of the Te Puni Korkiri Whenua Advisory Service.
The general purpose of this plan is to provide a collaborative document in association with the landowner(s) that identifies the goals of the farm business, provides a resource stock take and address any environmental and sustainability issues. The focus of the plan is fivefold.

(i) To summarize the farm enterprise, including the farm business goals and highlighting any challenges it faces.
(ii) To describe the land and soil resources including their strengths, weaknesses and management requirements.
(iii) To summarize and assess the current land management in relation to soil health, water quality, nutrient management, chemical use, stock and pasture management and biodiversity.
(iv) Identify development opportunities and/or land use diversification opportunities.
(v) Develop a works plan, based on the land management assessment, in association with the landowner, to help achieve long-term sustainability of the farm business.

The specific goal of Tapuaetahi Inc for this EP is for it to be captured within a wider plan called the Kaitiakitanga plan that "seeks to assist in the replenishment of the ecological settings of their natural resources on their whenua and in their waters (awa and moana). It will provide a path for transitioning farming practices and resources to support this and provide a guide for future land development ideas and opportunities".

2.0 FARM SUMMARY

Tapuaetahi Inc have undertaken significant environmental works on their whenua. Waterways and wetlands are all fenced, over half of the whenua is in fenced retired native bush with an extensive pest management programme in place to protect native flora and fauna. The trust is very focused on the restoration and protection of the whenua and surrounding marine environment. Their foundational principle being "Kei kaua te Whenua i riro ai" – the land is never lost. This section presents the whenua enterprise and its management and is supported by a property description and paddock maps which show the whenua with its natural features and infrastructure.

2.1 Whenua Goals and Aspirations

- The land is never lost.
- Only leave footprints.
- Want the EP to form part of overall betterment of whenua and people.
- Buffer coast from farming. Mitigate any impacts from farm on coastal environment.
- Protect dotterels nesting on beach.
- Restore waterway health and riparian plantings to match the area.
- Establish totara forestry rather than radiata.
- Pest management a priority to protect Kiwi and other native species.
- Expand farming operation over 30 years to include 2400ha.

2.2 Challenges to Whenua Goals and Aspirations

- Government regulations.
- Rates
- Climate – dry summers.
- Maintaining stock weights to maintain value of the Wagyu marbled meat.
- Electric fence maintenance.

2.3 Stock Policy

Stock are moved between the Te Tii and Te Whangae whenua. Over the two blocks 150 Angus breeding cows are run and put to either a Wagyu or an Angus bull. Progeny are all finished on farm with Wagyu cross animals having a target live weight of 600kg for steers and 500kg for heifers. Animals take 3-4 years to reach target weights. Moving to more Angus breeding and finishing.

2.4 Resource Summary

Feature	Farm Data
Name of Farm Operator	
Contact details	
NZ Business number	
Name and contact details of owner(s), lease or license holder(s) of the land (if different to farm operator)	
Farm address	
Catchment	Te Tii estuary, directly to marine environment
Climate	Average annual rainfall 1714 mm
	Annual mean temperature 15.3°C
Topography	41% Flat to undulating. 19% Undulating to rolling. 11% Rolling to strongly rolling. 15% Strongly rolling to steep.
Soils	70% Volcanic soils 30%Sedimentary soil
Whenua Area	345ha
Total Paddock Area	172ha
Indigenous Vegetation	173.4ha
Fenced Indigenous Vegetation	173.4ha
Length of Perennial Waterways	4,086m

Length of Ephemeral Waterways	3,270m
Number and area of Wetlands	3 wetlands covering 2.4ha
Number of fenced wetlands	3
Significant landscapes	Significant bird area. – Proposed Regional Plan Significant ecological area – Proposed Regional Plan Significant natural area – FNDC proposed district plan
Leased or licensed area if any (hectares)	
Any current resource consents held in respect to this FWFP	
Land use	
Name of the person who has prepared the plan	

2.5 Farm Management

Tapuaetahi Incorporation are very active and focused on their farm management seeking the best for their whenua and people. Their management of the whenua at Te Tii is summarised below.

2.5.1 Soil

- There are pug prone soils present try to minimise stock treading damage.
- 4ha of plantain have been sown using full cultivation then over sown in second autumn into permanent pasture. Have funding for 50ha of regrassing.
- Small areas of erosion occurring. Steep slopes by the coast will be fenced.
- Steep gullies have all been retired and fenced with native bush cover.

2.5.2 Water

- All waterways are fenced within gully systems and have a significant native bush or wetland buffer.
- Stock are fully watered via reticulated water.

2.5.3 Fertiliser

- 400kg/ha of superphosphate with sulphur and potash is applied in September or October each year.
- Strategic use of nitrogen at 40kg/ha/N over 30ha. Would like to use a bit more during August.

2.5.4 Weed Management

- There are flat weeds and gorse present which are controlled by spot spraying with the tractor.

2.5.5 Pest Management

- A detailed pest management strategy is in place in association with the Northland Regional Council (NRC) and the Kiwi Coast Trust. With possums, rodents, mustelids, feral cats,

feral pigs, and feral goats being targeted through a combination of trapping, shooting, and poisoning.

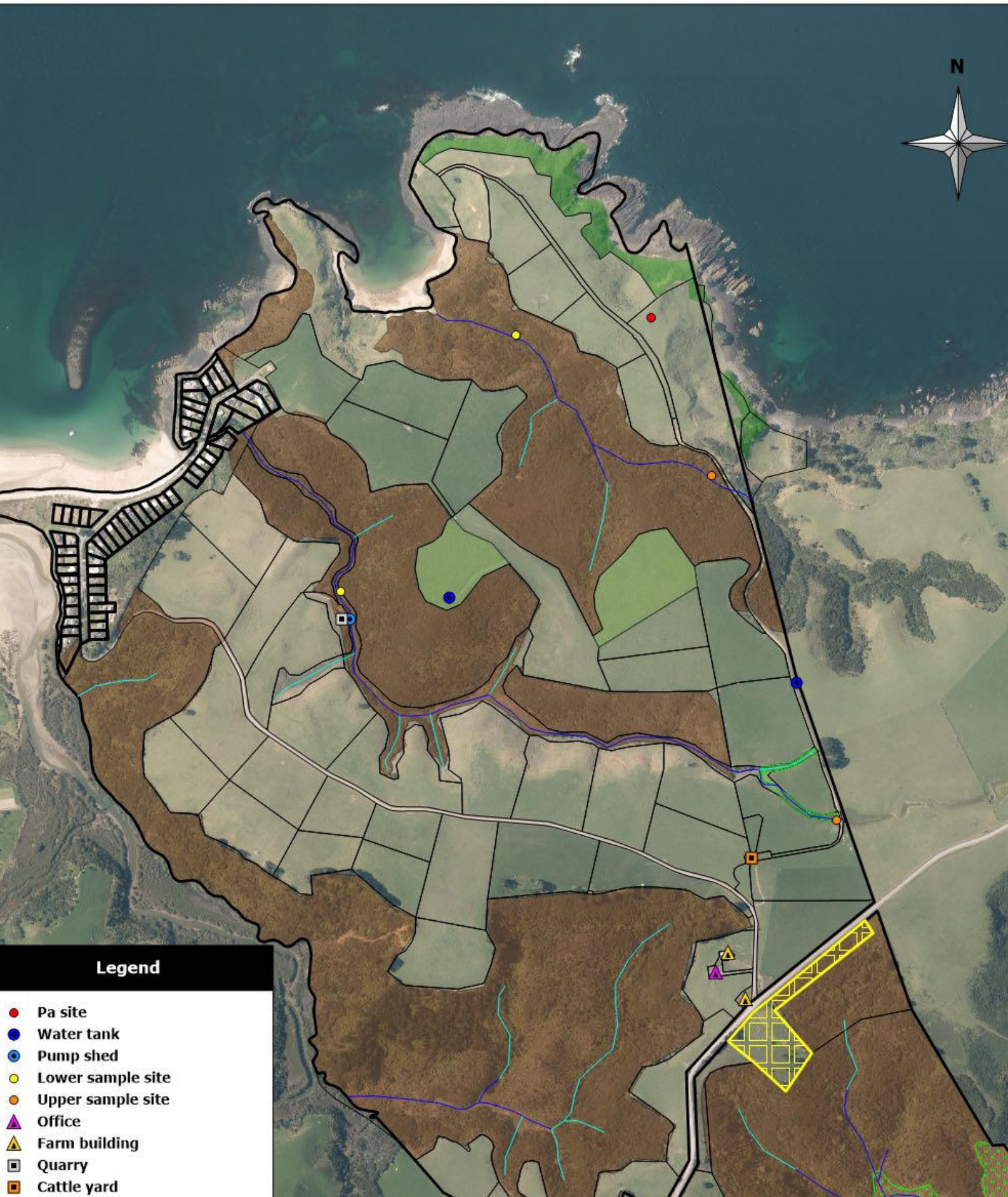
2.5.6 Natural Heritage

- Over half of the whenua is covered in native bush. This has all been fenced and retired from grazing.
- Patches within fenced areas that have no tree cover will be targeted for planting with funding options being investigated to support this project.

2.5.7 Greenhouse Gases

Nothing is included in the Emissions Trading Scheme (ETS).

Tapuaetahi Property Description



Tapuaetahi Paddock Map

3.0 RESOURCE AND ENVIRONMENTAL ASSESSMENT

Through site visits to Tapuaetahi Inc at Te Tii a land resource inventory (LRI) of the property has been made. This process involves mapping the soil types, soil parent materials, land slopes, erosion type and severity and land cover. This information is then used to produce land use capability (LUC) and soil maps of the property. The LUC system is a way of assessing the productivity of land and includes specific management requirements and land class characteristics. Though soil type forms a part of the LUC system it is dealt with separately as understanding the soil types on the property is essential in sustainable farm production as well as sustainable environmental management. Soil types are described along with their specific management requirements in the following section. These are then followed by an LUC table of the units present on the whenua. As part of the site visits all critical source areas (CSA) and actual and potential regulatory compliance issues are identified. CSA are areas on the whenua that are causing or can potentially cause environmental degradation. This can be point source degradation such as runoff from stock yards to non-point source such as diffuse runoff from a paddock. Following on from these are sections presenting waterway assessments carried out on the whenua and a whenua biodiversity summary and the whenua pest management plan.

3.1 Soil Descriptions

	**Soil Name:** Otaha gravelly clay loam (ODg) **Soil classification:** Strongly to very strongly leached brown loams **Parent material:** Basalt flows and ash from the Kiripaka suite **Soil description:** ODg soils were formed through a strong leaching process under kauri forests. This process has left behind a naturally infertile, friable topsoil over a layer of iron nodules and accumulated aluminium. This gravelly layer becomes toxic to plant roots at low pH levels and can fix large volumes of phosphates and other necessary plant nutrients. To carry out horticulture on these soils, pH levels within the plant root zone must be determined and raised to optimal levels. Under pasture soil structure can be lost through pugging damage with soils becoming compacted and water infiltration significantly reduced or prevented. Structure is also vulnerable to degradation when soils are dry forming a powdery surface which sheds water when structure is lost. **Overall drainage**: Well to somewhat excessively drained

	**Soil Name:** Otaha clay (OD) **Soil classification:** Strongly to very strongly leached brown loams **Parent material:** Basalt flows and ash from the Kiripaka suite **Soil description:** OD soils were formed through a strong leaching process under kauri forests in the same way as ODg soils. They are not however as strongly leached as ODg and lack the iron nodule layer. They do still need similar management as ODg soils. To carry out horticulture on these soils, pH levels within the plant root zone must be determined and raised to optimal levels. Under pasture soil structure can be lost through pugging damage with soils becoming compacted and water infiltration significantly reduced or prevented. Structure is also vulnerable to degradation when soils are dry forming a powdery surface which sheds water when structure is lost. **Overall drainage:** Well drained.
	**Soil Name:** Okaihau gravelly friable clay (OK) **Soil classification:** Strongly to very strongly leached brown loams **Parent material:** Basalt flows and ash from the Kiripaka suite **Soil description:** OK soils were formed through a strong leaching process under kauri forests. This process has left behind a naturally infertile, friable topsoil over a layer of iron nodules and accumulated aluminum. This gravelly layer becomes toxic to plant roots at low pH levels and can fix large volumes of phosphates and other necessary plant nutrients. To carry out horticulture on these soils, pH levels within the plant root zone must be determined and raised to optimal levels. Under pasture soil structure can be lost through pugging damage with soils becoming compacted and water infiltration significantly reduced or prevented. Structure is also vulnerable to degradation when soils are dry forming a powdery surface which sheds water when structure is lost. **Overall drainage:** Excessively drained.

	**Soil Name:** Rangiora clay, Rangiora clay hill soil (RA, RAH) **Soil Classification:** Moderately to strongly leached yellow-brown earths from the Marua suite. **Parent material:** Greywacke and Argillite **Soil description:** Rangiora clay is a strongly developed, friable, imperfectly to poorly drained clay soil. Like all YBE soils at this stage of development, some of the clay has been leached from the topsoil making it easier to create a fine tilth. Occupying hill country close to the east coast, they can suffer dry summers followed by high intensity, short duration rainstorms increasing the risk of sheet and rill erosion on cultivated land with resultant slipping on steeper country. **Overall drainage:** Moderately to imperfectly drained
	**Soil Name:** Marua brown clay loam Marua brown clay loam hill soil (MR, MRH). **Soil Classification:** Moderately to strongly leached yellow-brown earths from the Marua suite. **Parent material:** Greywacke and Argillite **Soil description:** Marua soil is a moderately to strongly developed, friable, well drained clay loam soil. Like all YBE soils at this stage of development, they have a relatively high clay content in the topsoil making it difficult to create a fine tilth. Occupying hill country close to the east coast, they can suffer dry summers followed by high intensity, short duration rainstorms with resultant slipping. **Overall drainage:** Moderately well drained

	**Soil Name:** Hukerenui silt loam with yellow subsoil (HKr, hill soil HKrH) **Soil classification:** Moderately podsolised yellow-brown earths from the Marua suite **Parent material:** Greywacke and argillite. Soil description: Hukerenui soils on easier slopes have a strongly developed columnar subsoil structure, making them highly susceptible to gully erosion. As with all more mature soils, these soils are acid and supplies of macro and micronutrients are low or non-existent. Reduced clay, however, means that nutrients are more readily available to plants; less phosphate, for example, is needed to offset fixation by clays. A 'little and often' fertiliser programme will avoid leaching losses. These soils are naturally very wet in winter and dry in summer, but these extremes are reduced as organic matter is incorporated into the soil. Careful winter management is required to avoid pugging. Overall drainage: Poorly drained

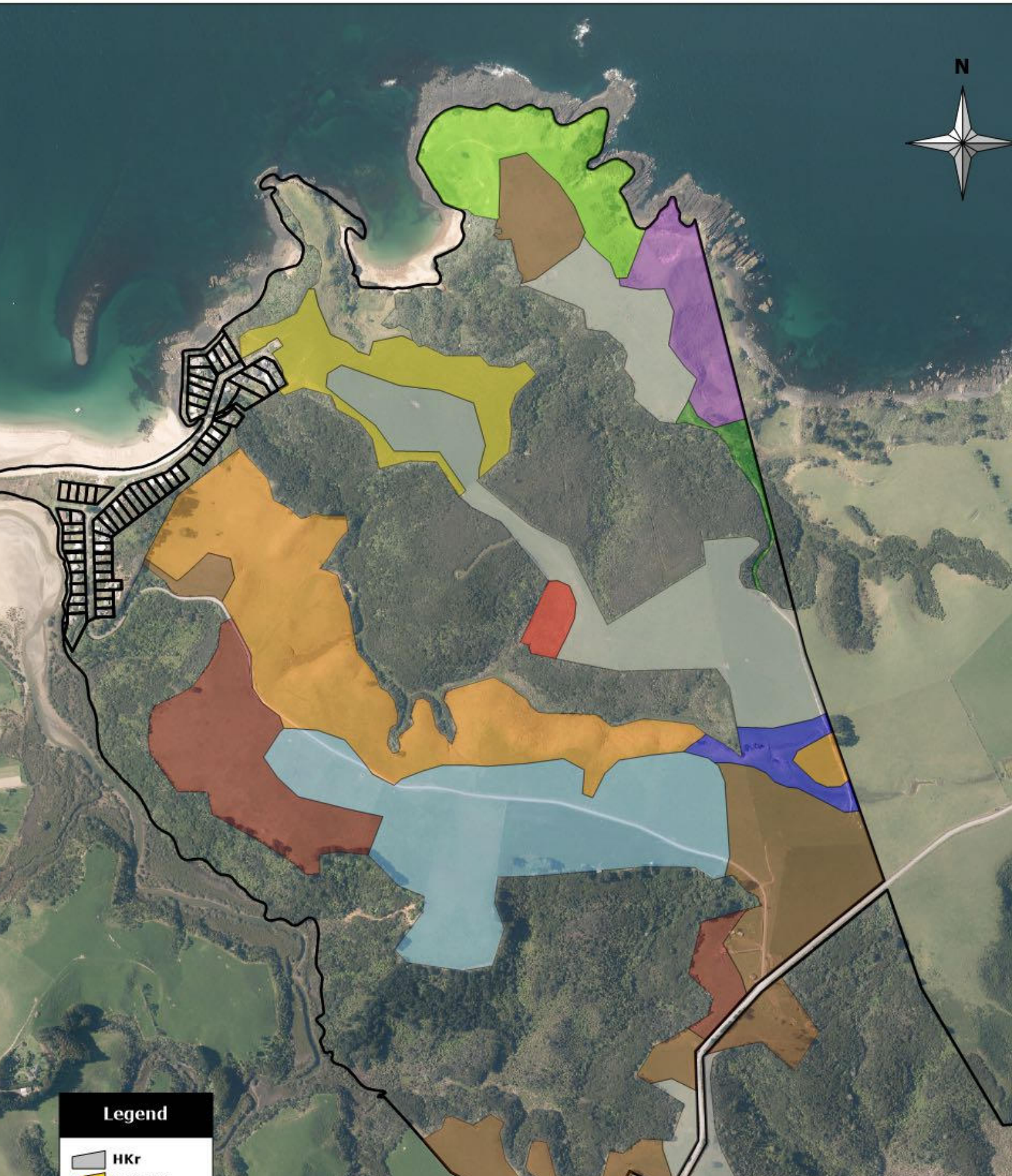
Soil descriptions taken from field work and unpublished work by Bob Cathcart on Northland Soils

3.2 Potential Horticultural Soils

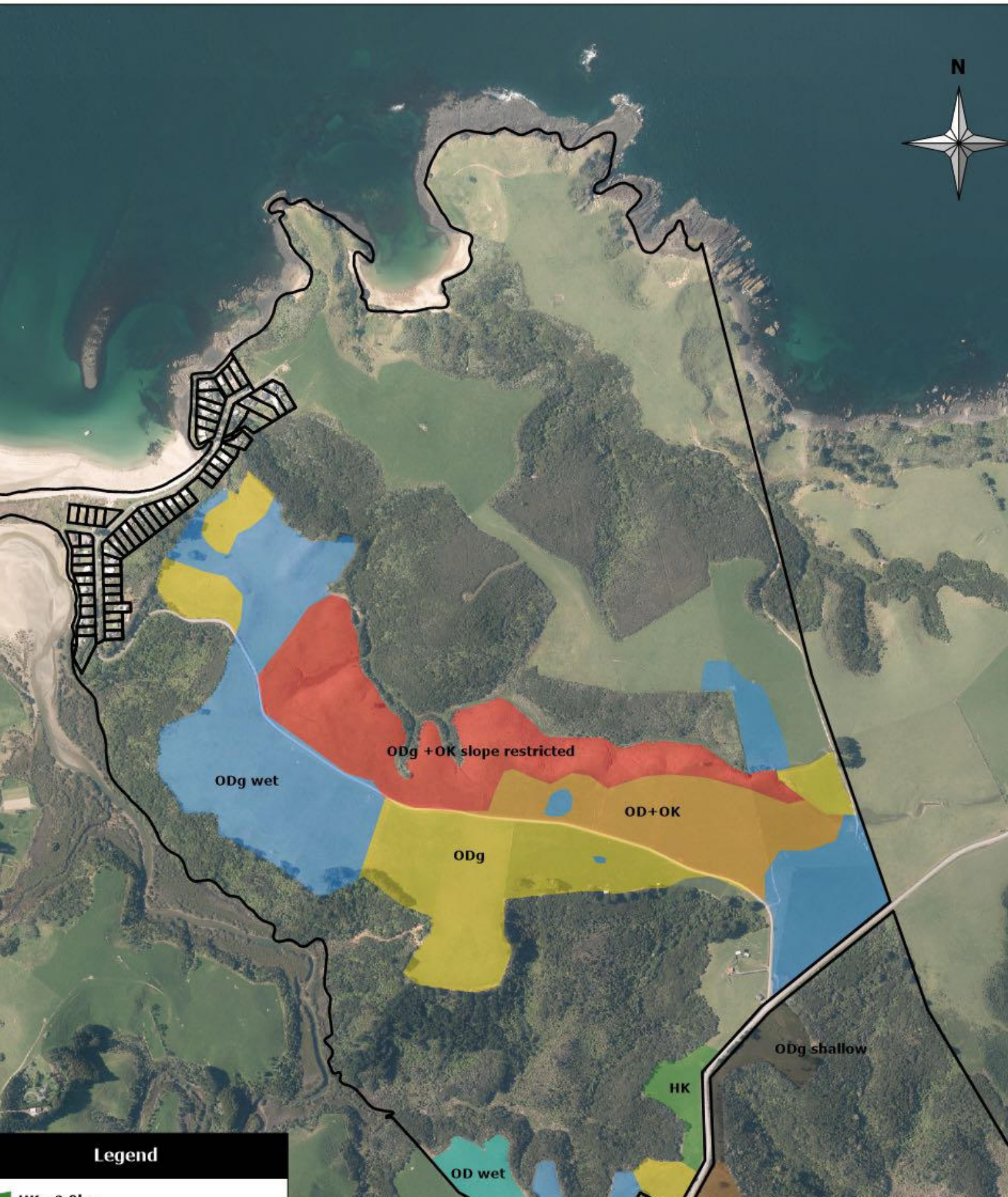
A detailed soil map of the potential horticultural soils is presented in this section with the soils described below and in the soil description table above. The Otaha (OD) soil that dominates the area is separated into four subclasses based on limitations to horticultural use and drainage. The area in orange OD+OK (10.6ha) is the best suited to horticulture with minimal or no iron nodules present in the soil profile and being well drained showing no signs of surface water after heavy rain. The ODg soil in yellow (20.8ha) is well drained but has high iron nodule content as expected with a standard ODg soil. Areas marked in blue (32.2ha) have a standard ODg profile with abundant iron nodules but also have impeded drainage and surface water after heavy rain. This is a result of a compacted/very dense nodule layer as well as runoff from slopes above. The area in red (17.1ha) is well drained ODg+OK soil but with minimal horticultural potential due to the steepness of the slopes. If horticulture is being considered liming to depth is recommended to raise pH and minimise the chance of aluminium toxicity to plant roots in the ODg soils. Soil ripping may also help to break up the compacted nodule layer and improve drainage. The remaining areas mapped include:

- HK soil (2.0ha) which is a podzolised soil with poor drainage, low natural fertility, low pH and is only suitable for limited horticulture such as root and green fodder cropping.
- Shallow ODg soils (2.6ha) which are not well suited to horticulture due to their shallow depth and have been identified as the potential site for papkianga housing.
- OD and ODg (5.4ha) soils shown in brown on the map are well drained and have similar horticultural potential the area of OD+OK soil with minimal nodules.
- Wet OD soil (2.3ha) has no gravel but is very wet over the winter due to the limited internal drainage and receiving runoff from the slopes above. It could be used for root and green fodder cropping and seasonal cropping/vegetable growing.

Tapuaetahi Soil Map



Tapuaetahi Potential Horticulture Soils



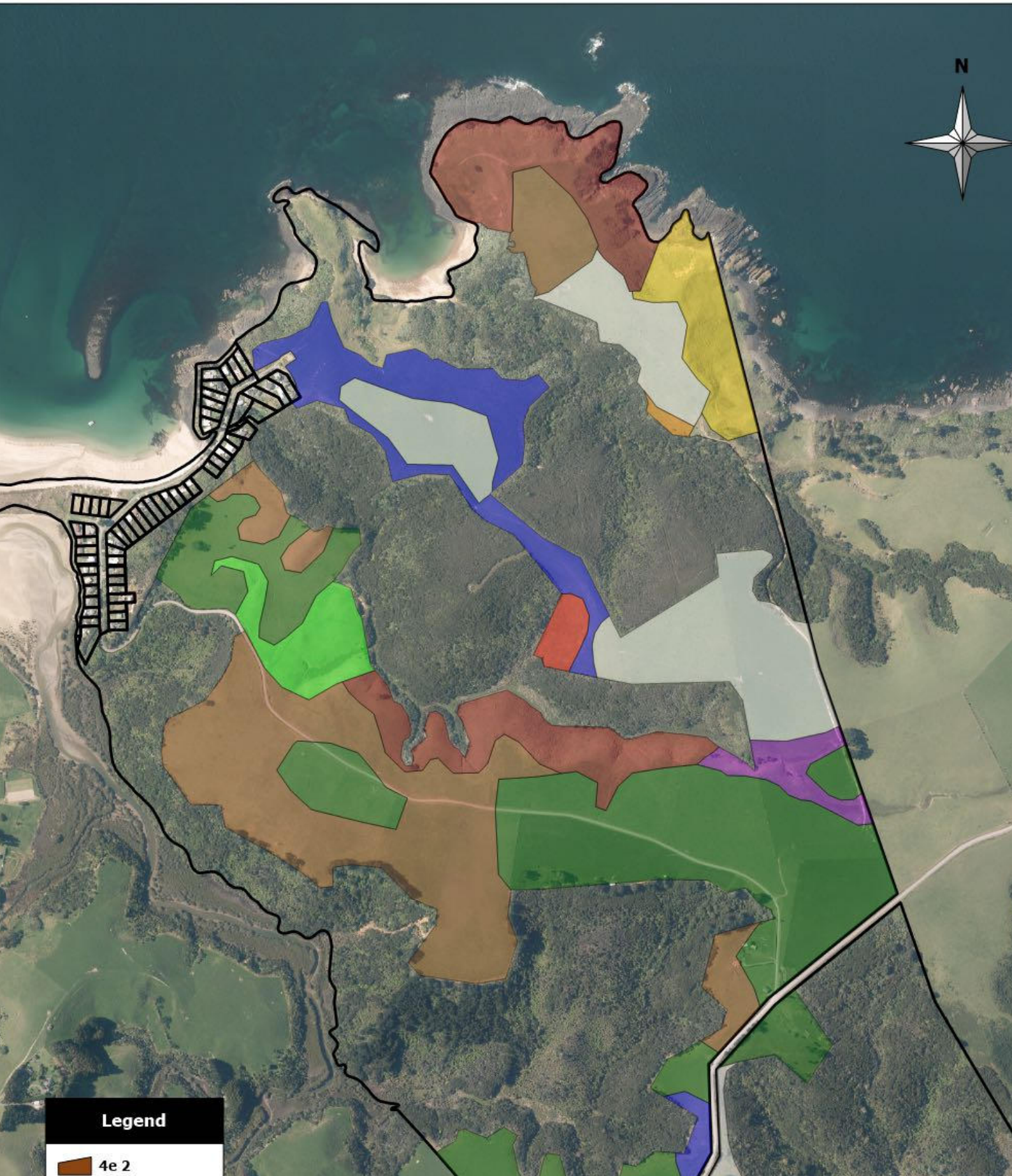
moving from class one being the most versatile, multi-use land with minimal physical limitations for arable use and increasing to severe limitations under class
berry production, pastoralism, tree crops and production forestry. Classes five to seven are suitable for pastoral farming and production forestry with class eight
catchment protection and conservation purposes. The table below presents the LUC units present on the whenua.

Resource information	Luc unit	Total area (ha)	Parent material	Dominant soil type	Slope degree	Land Cover	Erosion degree & severity		Strengths	Limitations	Landuse suitability
							Actual	Potential			
4e 2 Rolling to strong rolling slopes on young basaltic rock and ash. Soils subject to moisture deficiencies.		38.5	Basaltic lava.	Brown and red loams.	8-20º	Pasture	Nil.	Slight to moderate sheet, soil slip, rill, gully and wind. Moderate to severe sheet, rill, wind and gully when cultivated.	• Access and contour • Can produce good quality pasture. • Shelter trees for livestock	• Soils prone to seasonal moisture deficit	Root green fodder crops. Horticulture. Intensive grazing. Forestry
4e12 Gently rolling to strong rolling slopes within subdued rolling landscape with podzolised soils.		11.3	Massive sandstone and mudstone, jointed mudstone, bedded sandstone and mudstone, argillite, crushed argillite, association of rocks, sheared lithologies, lavas and welded ignimbrites.	Podzols on various sedimentary lithologies.	8-20º	Pasture	Nil	Moderate sheet, gully, earthflow, soil slip and tunnel gully. Moderate to severe sheet, rill and gully when cultivated.	• Contour. • Accessibility	• Soils have natural low fertility	Pasture Root and green fodder crops. Forestry
4s 2 Flat to undulating slopes on old deeply weathered basalt rock with low fertility and areas of poor drainage		48.8	Lavas and scoria	Strongly to very strongly leached brown loams	0-7^0	Pasture	Nil	Slight to moderate rill and sheet when cultivated.	• Contour • Accessibility	• Seasonal moisture deficits • Soils can have poor internal drainage • Soils can have a high pugging risk • Soils generally have low fertility.	Pasture Root and green fodder crops. Horticulture Forestry
4s 4 Flat to undulating slopes within a subdued rolling landscape with podzols and podzolised brown soils.		22.5	Fine alluvium or unconsolidated clays and silts and sheared mixed lithologies.	Podzols and podzolised brown soils.	0-15^0	Pasture	Nil	Moderate gully and tunnel gully under pasture. Slight to moderate sheet, rill and gully when cultivated.	• Contour • Accessibility	• Poorly drained soil • Winter wetness • Soil has low natural fertility	Pasture Root and green fodder crops Forestry

6e 4 Strong rolling to steep slopes on basalt flows and basaltic scoria.	18.2	Lava, scoria	Brown and red loam hill soils	16-25º	Pasture	Slight to moderate sheet and soil slip.	Slight to moderate soil slip and sheet. Slight gully	• Stable hill country • Can support good pasture production	• Slope • Erosion potential	Semi intensiv to intensive grazing Forestry
6e 17 Moderate to steep slopes forming hilly terrain.	5.6	Greywacke	Yellow-brown earth hill and steep land soils	21-35º	Pasture	Slight soil slip	Moderate soil slip, sheet, and gully. Slight earth slip	• High forestry production potential	• Erosion potential • Slope	Grazing Forestry
6e21* Rolling to moderately steep slopes forming hilly terrain	1.1	Shale	Moderately podzolised soils and podzols	16-25º	Pasture	Nil	Severe gully, sheet, soil slip and earth slip	•	• Erosion potential • Soils have poor internal drainage and are vulnerable to pugging damage during the winter. • Soils dry out quickly over the summer. • Soils have low natural fertility. • Hard silica pan in subsoil	Grazing Forestry
7e 11* Steep to very steep moderately podzolised to podzolised yellow-brown earth sols on weathered sandstone, mudstone, and claystone parent material.	1.3	Sandstone, mudstone, claystone	Moderately podzolised soils and podzols	20-35^{0}	Pasture	Negligible	Severe sheet and gully erosion	• Contour assisted drainage	• Podzolised soils with poor internal drainage • Soils prone to pugging and compaction. • Erosion risk • Contour	Grazing Erosion control forestry

Land use capability unit descriptions are taken from field work and from Land use capability classification of the Northland region (Harmsworth, 1996).
Revised stock carrying capacities in green are taken from work carried out by Bob Cathcart in April 2017 revising the rating supplied by Harmsworth in 1996.

Tapuaetahi Land Use Capability Classifications



4.0 WATERWAY ASSESSMENTS

4.1 Waterway overview.

Tapueatahi Inc are creating a sustainable farming operation while also being environmentally conscious and increasing the biodiversity of their whenua. Part of this process is understanding the effects the farming operation is having on their waterways the marine environment they discharge into. To understand these effects the trust is wanting to set up water quality monitoring sites where the water quality can be sampled and tested. A brief overview of the perennial waterways on the whenua has been given to help identify key aspects that will contribute to monitoring site placements.

4.2 Streams within the Tapuaetahi catchment

There are two main, perennial waterways within the whenua catchment (identified as stream 1 & 2) and two ephemeral water ways. Stream 1 is a shared tributary with its headwaters located within the neighbouring property. Stream 1 and 2 both discharge directly into the ocean whereas stream 3 and 4 both discharge into the estuary. Each stream is found within a step gully that has been fenced for approximately 10+years. Each stream is surrounded by native bush (Refer to Map 1), with the bottom of the gully having a more mature, diverse mix of native trees such as Puriri, Koikoi, Kowhai, Lacebarks and Coprosma. On the outer edges closer to the gully ridge tops, pioneer species such as Manuka, Kanuka, and Totara are more dominant.

The majority of the whenua catchment feeds into the two perennial waterways, Stream 1 and Stream 2, along with some of the neighbouring farm catchment. Stock on the whenua are excluded from the perennial waterways and only have access to a very short section of ephemeral drain that feeds through from the neighbouring farm. This helps to minimise sediment, nutrients and bacteria entering the waterways. However, in the adjacent farm, stock can enter the headwaters of Stream 1 and Stream 2 which will be contributing sediment, nutrients and bacteria to the waterways when stock and water are present.

4.3 Stream Composition

Stream 1 and Stream 2 are a mixture of soft bottom, hard bottom, and gravely bottom substrates (Refer to Images 1-3). The head waters run originate in and flow through predominantly clay soils. Evidence of iron-oxidising bacteria was observed within two of the streams as the orange bacteria smothered the waterway bottoms (Refer to image 4). The headwaters of each stream had high sediment deposits which were observed covering the gravelly stream beds (Refer to Image 5).

The middle of Stream 1 and 2 both cut through and run over hard parent rock. Because of this, hard bottom pools and chutes are the dominant environments. Suspended sediment was observed in these pools (Refer to Image 6), as well as low aquatic organism presence. However, there were healthy levels of leaf litter, organic material, logs, and large rocks were observed, indicating suitable habitat for macroinvertebrate communities.


Tapuaetahi Waterways
N
Stream 1
Stream 2
Legend
Upper sample site
Lower sample site
Waterway
Hanmore
Land Management
Property Location: Pererua Road, Te Tii, NZ. Date:31st May 2022. Scale 1:9,000. Map Created By: Hanmore Land Management LTD. Email:ian@hlm.co.nz

At the mouth of Streams 1 and 2 the dominant substrate that was observed was sand/fine sediment. Because of the contour of the waterway, the water was slow moving which can be good for saltwater/freshwater fish species.

Image 1: An example of hard parent rock streambed substrate.

Image 2: Fine sediment/gravel (Soft bottom) is seen as the dominant substrate within this stretch of the water way.

Image 3: Gravel with larger rocks (Gravely) is seen as being the dominant substrate within this stretch of the waterway.

Image 4: Iron-oxidising bacteria (Orange substrate) can be seen within the waterway indicating that iron is leaching from the surrounding soil.

Image 5: A fine layer of sediment can be seen layering the gravely bottom of the headwaters of Stream 1.

Image 6: Suspended sediment, leaf litter and other organic matter can be seen within this pool in Stream 1.

4.4 Stream 1

4.4.1 Lower monitoring site

This site was located in the lowest zone of the stream before the saltwater mixes with the freshwater (Refer to Map 1). The site was dominated by ponds and chutes, which was made up of large boulders, small gravel, and bedrock. There was a forest buffer zone of over 10m

either side, which contained mature natives closer to the stream. Because of this there was adequate shading as well as organic matter.

4.4.2 Higher sample site

This site was located on the upper end of the stream where the headwaters feed from the neighbouring farm into the whenua (Refer to Map 1). This site is made up of predominantly riffles and ponds with small gravel. There were high levels of sediment deposits within the stream. There was adequate shading around the stream which stretched out to a 10m buffer zone. There were healthy levels of organic matter within the stream which can help support macroinvertebrate communities.

Stream 1	Bottom	Top	NIWA Health Guide
Temperature	12.3°C	12.6°C	<20°C
Nitrate level	Less than 0.05 mg/L	Less than 0.05 mg/L	0 mg/L
Conductivity	274	191	0-500
Clarity	1.25m	1.775m	1.25<
Phosphate	0 mg/L	0.03 mg/L	0 mg/L
E.coli	1 colony per 1ml	0 colonies per 1ml	0
Macro-invertebrates	Caddisflies, Molluscs, shrimp MCI score average: 5.75	Worms. MCI score average: 2	The higher the MCI score the better, ie 10.
Sediment deposition	<0.5cm	>1cm	<0.1cm

4.4.3 Interpretation.

Overall, Stream 1 data shows that there was a slight difference in conductivity, phosphate levels, and macroinvertebrate numbers between the upper and lower sample sites. However, there is no obvious trend between sites which indicates there is little to no difference in water quality. Nitrate and phosphate are shown to be at very low levels which suggest low levels of these nutrient are entering the waterway in runoff and/or they are being filtered from runoff before they enter the waterway or recent high flow levels have washed them from the waterway.

An important note in the results is the higher sediment deposition at the top sampling site. There was a covering of sediment over the stream bed, with some places having more than 1cm of sediment deposition. These high levels of sediment could explain the lack of macroinvertebrates found at this site as most macroinvertebrates find it difficult to survive in such environments especially sensitive, high MCI scoring species.

The high levels of sediment at this site are likely a result of stock trampling in the stream headwaters on the neighbouring farm, track runoff discharging directly into the waterway and possibly slight stream bank and other erosion that was observed close by. Ongoing monitoring would help identify whether this could be increasing sediment deposition.

4.5 Stream 2

4.5.1 Lower sample site

This site was located below a waterfall and was surrounded by semi-mature native bush (Refer to Map 1). A quarry is located just above the sampling site where recent digging and erosion

have taken place. Upon first inspection, unlike the top site there was minimal sediment deposition on the streambed, however, there was a shiny oil sheen on top of the water and an orange scum on the bedrock that was along the face of the waterfall. The sampling site was mostly made up of a run with a pool at the bottom of the waterfall.

4.5.2 Higher sample site

This site is on the boundary of the neighbouring farm (Refer to Map 1). Kikuyu was the only vegetation that lined the stream before it descends into the bush. Most of the stream at the sample site was completely covered in kikuyu apart from the culvert discharge point. At this sample orange scum and a large amount of sediment were deposited on and around the pool area. There were also minimal macroinvertebrates observed.

Stream 2	Bottom	Top	NIWA Health Guide
Temperature	13.1°C	15.3°C	<20°C
Nitrate level	<0.05	0.15	0
Conductivity	119	153	0-500
Clarity	2.12m	0.20	1.25<
Phosphate	0.04	0.12	0
E.coli	9 colonies per 1ml	1 colony per 1ml	0
Macro-invertebrates	Pointed snails, shrimp MCI score average: 4.5	Boatmen. MCI score average: <1	The higher the MCI score the better, ie 10.
Sediment deposition	<0.5cm	>5cm	<0.1cm

4.5.3 Interpretation

Overall, Stream 2 data shows that the top sampling site had a significantly higher phosphate and nitrate levels as well as a higher temperature and much lower clarity. This indicates that these levels are dropping before they leave the tributary and enter the ocean. Because there is a lack of vegetation surrounding the top sampling site, direct runoff from the adjacent paddocks, farm track and neighbouring property it is expected that phosphate and nitrate levels and conductivity will be higher, clarity will be lower, and sediment deposition would be greater than that of the lower sample site.

The data shows that there is a higher count of E. coli colonies within the water at the lower site than the higher site. However, at the time of the sampling it was noted that cattle were in the paddock adjacent to the stream slightly higher up the catchment to the sampling site. They had also recently been in paddocks close to the stream buffer zone. This may explain why the E. coli count was higher at this site.

Based on the data collected there are higher levels of nitrate, phosphate, sediment, and conductivity, lower clarity and lower numbers of macroinvertebrates in the upper reaches of Streams 1 and 2 compared to the lower reaches of the streams. It is likely that this difference will be due to the farming activities close to or in the streams on the neighbouring farm and on the whenua.

It should be noted that there was a lack of high scoring macroinvertebrates present and an overall low number of macroinvertebrates found throughout both streams. It would be expected that due to the relatively low levels of pollutants and ideal habitat cover there would

be higher numbers of macroinvertebrates present as well as sensitive species such as stonefly and mayfly larvae. Possible explanations for this include recent high flow levels, possible low dissolved oxygen or unseen pollutants.

4.6 Recommendations

To build up an accurate picture of the health of the waterways on the whenua ongoing monitoring is required. This needs to be carried out a number of times throughout the year to account for the differing seasons and the impacts of rainfall and temperature variation. This will build up sufficient data to show the impacts of different environmental conditions as well as the possible impacts of the farming operation.

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5.0 BIODIVERSITY

Tapueatahi has diverse landforms and habitats being made up of coastal cliffs, estuarine flats, coastline, broad volcanic ridge tops, bush clad gullies and pasture. Half of the whenua is in pasture and utilized for the farming enterprise with the majority of the remaining half being in retired native bush, wetlands, coastal cliffs and coastline. Each of these different ecological areas provides habitats for a variety of native flora and fauna including dotterels, kaka, bellbird and the north Island Brown Kiwi.

5.1 Native Flora

The fenced and retired areas of native vegetation across the whenua are typically in steep gullies and hillsides. The flora in these areas is dominated by pioneer tree species such as manuka and kanuka higher up the gully sides while the lower parts of the gullies are dominated by subcanopy species such as cabbage trees, lacebark, coprosma, five finger and various tree fern species including mamaku and silver ferns as well as immature kanuka. Some canopy species such as kohekohe, puriri, mature kanuka and kowhai are also present in the bottoms of these gullies. Since stock have been excluded from these areas understory plants have begun to thrive with various fern species, five finger species, nikau and canopy seedlings becoming established.

Tree species present lower in the gully systems.

Understory flora including canopy tree seedlings thriving since stock exclusion.

Areas of retired native vegetation dominated by manuka are present on easier areas at the tops of gully sides and on broad ridge tops. These areas will likely remain manuka dominant for many years into the future due to the podzolized soil types on which they are established. The acid nature and low fertility of these soils means few tree species will grow apart from manuka. These soils are not present on the steeper sides and in the bottoms of gullies. As such, and as can be seen from the picture above canopy seedlings are growing well and in the years to come will emerge from the subcanopy species and restore the natural forest structure in these areas.

5.2 Pest Management

A robust pest management plan has been established by Tapuaetahi Inc. with the support of the NRC and Kiwi Coast Trust. This plan includes the following four objectives:

1. Set up a trapping network.
2. Service traps to set frequency
3. Pest control in new riparian fenced areas.
4. Monitor kiwi call data.

5.2.1 Set up a trapping network.

70 traps have been deployed around the whenua with poisoning and shooting also employed to manage pest. Animal pests that are targeted include: possums, rodents, mustelids, feral cats, feral pigs and feral goats. Below are tables showing the trap types and toxins used and the methods of control for each pest species.

Trap Type	Pest species	Number	
DOC200 kill trap	Stoat, weasel, rat	35	
SA2 kill trap	Feral cat, possum	35	
DOC250	Ferret	Deployed if needed	Contingency
Rat trap	Ship & Norway rat	Deployed if needed	Trap, toxin or both
TOXIN	**Pest species**	**Action**	
Cyanide	Possum	Non secondary kill	CSL operator required

Trap types and number deployed across the whenua.

PEST	TRAP	TOXIN	OTHER
Possum	SA2, Timms, Trapinator	Cyanide	-
Cat	SA2, Live capture	-	Shooting
Stoat, weasel, juvenile ferret	DOC 200	-	-
Rat (Norway & ship)	DOC 200, Victor, Snappy	-	-
Pigs	Live capture pen	-	Shooting
Goats	-	-	Muster, shooting

Methods of pest control by species.

5.2.2 Service traps to a set frequency.

Traps are serviced every four weeks over the winter and three weeks over the summer with a minimum of 15 services annually.

5.2.3 Pest control in new riparian fenced areas.

Where pest species are noted or likely to be present pest control will be undertaken in retired riparian areas.

5.2.4 Monitor kiwi call data.

Re-establish the kiwi call listening site last used in 2013.

5.2.5 Ongoing Monitoring

The effectiveness of the pest management plan will be monitored through a combination of trap records, kiwi call count survey and three yearly bird count surveys for kaka and bellbirds. The plan will also be audited annually by the NRC or approved contractor by visual inspection of trap baiting and wax tag chew cards.

6.0 LAND MANAGEMENT DISCUSSION

Matching land use to land class is a key aspect of sustainable land management as well as realizing the productivity potential of the whenua. The previous two sections have identified the soil types and land classes on the whenua including the specific management requirements. To make this information practical and useful in ongoing whenua management and planning areas with similar soil types, land classes and management requirements have been grouped together into land management units (LMU). A LMU map accompanies this section with discussion of each unit in the following sections.

6.1 Volcanics

This area of the whenua is mostly flat to undulating ridge tops with some rolling to moderately steep side slopes. The soil characteristics on this unit are the greatest limitation to productivity levels. They are strongly to very strongly leached brown loams that are well to excessively well drained, have low natural fertility and a layer of iron nodules that can be toxic to plant roots at low pH. There is however horticultural potential if these limitations are addressed through correct fertilizer and lime applications and irrigation. This unit is well suited to pastoral farming with the free draining soils helping to reduce soil wetness and the risk of pugging damage. It would be well suited to a cell system operation due to both the contour and free draining nature of the soils. Pugging management would still be necessary as soil compaction can seal the soil surface and make water filtration difficult, increasing runoff and reducing pasture production. The large volumes of ironstone nodules in the lower topsoil and upper subsoil along with the accumulation of aluminium makes these layers toxic to plant roots. At low pH free iron and aluminium and irreversible fix large volumes of phosphate so that it is unavailable to plants. Free iron/manganese can also upset the balance of micronutrients causing deficiencies in both plants and animals.

An example of the topography on the volcanic area of the whenua.

There is a small area of erosion occurring on this unit. This area will be difficult to revegetate due to the soil characteristics previously discussed. Livestock trampling will add to the difficulty in stabilizing this area.

There are no waterways on this unit with all stock watered from troughs via a reticulated water system. A small seep/ephemeral waterway feeds through from the neighbouring property to the east and into the wetland. Currently this has stock access and gets pugged, generating sediment which feeds into the wetland. A single hot wire would prevent this from occurring.

There is little in the way of shade and shelter for livestock across this unit. Specimen tree planting should be considered to address this issue.

Tapuaetahi Inc are investigating wastewater disposal on site for 75-100 dwellings. The soils on this unit are the most suitable for this purpose on the whenua. The detailed soil map shows the area in orange and yellow having the best drainage with the area in blue being wet after heavy rain and the area in red having good drainage but likely being unsuitable for wastewater disposal due to the steepness of the terrain. These observations are meant as a guide only based on the soil types and drainage characteristics with an engineers report needed to determine which of these areas should be used and the volumes of water that could be applied.

Iron nodules in the soil profile.

Small area of erosion on the vocanic unit.

6.1.1 Development Opportunities

- This unit has the potential to be utilised for a more intensive grazing system with opportunity to develop a techno or cell grazing system.
- Horticulture could be developed on this unit with the correct fertiliser and liming policy and irrigation.
- This unit has the most suitable for soil types for wastewater disposal on the whenua.

6.2 Podzols

This unit covers the majority of the grazing area on the north of the whenua. Topography varies from flat to moderately steep with podzolised soils. These soils are characterised by a white silica pan at approximately 200mm depth, low natural fertility, low pH and poor drainage. The soils become saturated and highly pug prone over the winter while drying out quickly over the summer. These characteristics make the soil the greatest limiting factor to production on this unit. The biggest challenge to farming this unit is the wet pug prone soil. There was a

significant amount of pugging damage across most of this unit at the time of the site visit. These soils will struggle to support heavy cattle over the winter and should have only light classes such as R1of cattle on them.
Fertiliser and lime applications are essential to reach productivity potential on this unit. Due to the nutrient leaching that has occurred on these soils when forming under kauri forest any nutrients applied are available for plant uptake. As such a little and often approach should be taken to fertiliser application to help minimise nutrient losses through runoff and leaching.
Good pasture and stock management is essential on this unit to continue to build good soil structure and reverse the podzolisation process. Avoiding pugging damage, rotational grazing and good nutrient management are all essential.
There is little in the way of shade and shelter for livestock across this unit. Specimen tree planting should be considered to address this issue.

6.2.1 Development Opportunities

- The flat and easier contour pastoral land could be developed into cell systems for lighter animals over the winter with all classes of stock through the summer.

An example of the Podzols LMU.

6.3 Coastal Hills

This is only a small unit and has been separated from the rest of the whenua as it is significantly different and has different management requirements. It includes the steep north and north-eastern facing slopes that border the coast. The soils here are a combination of sedimentary clay loams and volcanic clay. The sedimentary Rangiora and Marua soils are particularly vulnerable to erosion. Currently the boundary is unfenced, and livestock have access to the coastline. If continued pastoral farming is to occur on this unit erosion control planting and fencing will be required. Due to the coastal position and goals of the trust erosion control plantings would best be suited to native trees such as Pohutukawa. These will be a slower growing tree but will survive in the location and fit with the surrounding landscape and goals of the trust. Returns from grazing this area will be marginal at best due to the limited pasture production attainable on this area and as such alternative land uses should be considered. If

this area was to be retired from grazing a number of planting options would be available. Manuka could be planted for honey production, continuous cover totara forestry could be incorporated on the easier and most accessible locations or the area could be restored to a permanent forest habitat. Funding for any of the planting options on this unit would qualify for SHaRP funding.

6.3.1 Development Opportunities

- Continued pastoral farming with erosion control planting and coastline fencing.
- Tree planting for manuka honey production, totara forestry or permanent native forest.
- Any erosion control planting and fencing on this unit could be assisted with funding from the NRC SHaRP fund.

6.4 Retired

Over half of the whenua is retired from grazing and is in native bush. These areas not only serve to increase whenua biodiversity and provide habitats for native fauna but they also buffer waterways from farm activities and help to minimize erosion. There are areas within this unit that could have some active planting to fill in the open grass areas and offer waterway habitat protection and enhancement and wetland development. Some of these areas will qualify for funding from the NRC SHaRP fund. All of the fenced native bush on this unit has been noted as a proposed Significant Natural Area (SNA) by the Far North District Council (FNDC). This designation should have little impact on the management of this area, only impacting vegetation clearance or subdivision. Currently this designation is only at the proposed stage.

6.4.1 Development Opportunities

- There are a number of areas on this unit that have been fenced off from stock but remain unplanted. These are riparian and wetland areas. Planting the steeper areas would serve as erosion control while the riparian planting would help to improve waterway habitats and wetland plantings would help to develop a functional wetland habitat. The steeper areas to be planted would qualify for the NRC SHaRP fund.

6.5 Marine Environment

Though outside of the Tapuaetahi boundary the marine environment receives runoff, and water discharge from the whenua. Stock can also have access to the beach if fencing is not adequate. Tapuaetahi Inc are very focused on protecting and enhancing this environment and have actively managed their on-whenua activities to minimize any potential negative impacts. Within the western boundary the sandspit which runs parallel to Tapuaetahi beach forms part of the whenua. This is a habitat for the endangered Dotterel and may require active management to prevent erosion by the discharging estuary. This area and the remaining coastline to the north of the whenua and the estuary to the west of have been identified as significant ecological and bird areas by the NRC in their proposed Regional Plan. While the Te Puna inlet to the south has been identified as an important enclosed water body.

6.6 Greenhouse Gases

By the end of 2022 every farm will need to know the amount of greenhouse gases their operation produces. As part of this program the productivity team have generated this figure using the Farmax program. Currently Tapuaetahi is producing 426 tons of CO_2 per year.

Though they cannot be used to offset current emissions the Tapuaetahi Trust have requested the carbon sequestration by pre-1990 native vegetation on their whenua be made. Based on the MPI carbon look-up tables the 173ha of native bush on the whenua with an estimated age of 35 years has sequestered 49,997 tons of CO_2. Each year beyond that up until 50 years of age sequestration rates drop from 4T/ha/year to 2T/ha/year. At 4T/ha/year the current area of native bush would be sequestering 692 tons of CO_2 per year which gives a surplus of 266 tons. This surplus would then cover the short fall on Te Whangae and give an overall surplus of 44 tons. Without gains in efficiency of CO_2 production or additional plantings by the time the areas of native bush reach 50 years of age only approximately half of the CO_2 emissions for both Tapuaetahi and Te Whangae would be covered by the current areas of native bush.

6.6.1 2023 Update

The GHG figures were updated at the end of 2023 using the Beef & Lamb GHG calculator with the stock numbers for the 2022-2023 year and newly retired and planted areas. These results show the Tapuaetahi ran at a surplus of 338 T of CO_2 for the year. See tables below.

Farm emissions			Kilograms of greenhouse gases		
Source		Kilograms of Carbon dioxide equivalents CO_2-e*	Carbon dioxide CO_2	Methane CH_4	Nitrous oxide N_2O
Livestock emissions	Dairy cattle (incl. grazing dairy)	0		0	0
	Beef cattle	492,438		15,249	373
	Sheep	0		0	0
	Deer	0		0	0
Fertiliser and lime use	Non-urea nitrogen fertiliser	0			0
	Urea without urease inhibitor	0	0		0
	Urea with urease inhibitor	0	0		0
	Limestone	0	0		
	Dolomite	0	0		
	Total kg	**492,438**	**0**	**15,249**	**373**
	Kg / total ha	**1,427**	**0**	**44**	**1**
	Production region & Farm class average emissions (kg / total ha)	**3,871**	**181**	**122**	**2**

Tonnes of carbon dioxide equivalents CO_2-e		Tonnes of greenhouse gases		
		Carbon dioxide CO_2	Methane CH_4	Nitrous oxide N_2O
Carbon dioxide CO_2	0			
Methane CH_4 (tonnes CH_4 x 25)	381			
Nitrous oxide N_2O (tonnes N_2O x 298)	111			
Tonnes (X)	**492**	0	15	0
Tonnes / total ha	**1.43**			

Deforestation emissions		
Source		Kilograms of Carbon dioxide equivalents CO_2-e
Exotic forest	Harvest and deforestation	0
Indigenous forest	Established or regenerated indigenous forest deforested	0
Shrubland	Established or regenerated shrubland deforested	0
	Total kg	**0**
	Tonnes (Y)	**0**

Vegetation offsets		
Source		Kilograms of Carbon dioxide equivalents CO_2-e
Exotic forest	28 years of carbon storage, averaged per year	0
Indigenous forest	Combined total carbon stock for regenerating (less than 100 years old) and established (more than 100 years old) indigenous forests	830,811
Shrubland	Total carbon stock associated with shrubland older and younger than 30 years old	0
	Total kg	**830,811**
	Tonnes (Z)	**831**

Estimated net CO_2 emissions (t CO_2-e) = X + Y - Z	-338
Estimated net CO_2 emissions / total ha (t CO_2-e)	-0.98

* CO_2-e (Carbon dioxide equivalents) are calculated using GWP100 (global warming potential) from the IPCC, 2007, Fourth Assessment Report

6.7 Fertilizer Review

Management requested a review of the current fertilizer recommendations by Ravensdown to ensure money was being well spent and optimum pasture production achieved. To ensure the best advice was given an independent, reputable, former fertilizer rep was consulted with her comments included below.

The Ravensdown recommendations are much like a maintenance application.
My only comments would be that I'm assuming the application for the top hay is on top of the other fertiliser for Te Whangae (otherwise not enough Phosphate is applied) and also that I don't think the potassium is particularly necessary for the Tapuwatahi farm (especially for the

blocks with potassium levels of 13,14 and 16 - even 8 is on the top side of the economic optimum).
My recommendation would be to use that potash money on slightly higher phosphate inputs on the areas with Olsen P levels under 20 (or definitely those under 18). In a few years when the P and pH at optimum, then you could start to introduce potassium onto that volcanic land as a maintenance ever 1-2 years. But keep the low rates of potash going onto the Te Whangae block.
Otherwise, it is a pretty fair recommendation – simple but tried and true levels and products.

Nitrogen use is targeted across the farm and applied in one dressing at 40kg/ha. A second application is being considered. With two nitrogen dressings the total application would be 80kg/ha which is well below the cap of 190kg/ha/year.

7.0 RISKS TO FRESHWATER

Once all of the inherent vulnerabilities and farm management actions that impact fresh water have been identified their level of risk must be assessed. This is done using the risk matrix shown below. Identifying the level of risk is necessary to allocate appropriate actions and timeframes to address each risk. The tables on the following pages show how the risk is determined, assigns a risk level to each activity or vulnerability and then assigns an action and a timeframe to address the identified issue.

RISK MATRIX

Potential Impact				
High Impact (4)	5	6	7	8
Moderate (3)	4	5	6	7
Some Impact (2)	3	4	5	6
Minor (1)	2	3	4	5
	Minimal (1)	Sometimes (2)	Often (3)	Always (4)

Likelihood of Loss

HIGH | MEDIUM | LOW

Examples

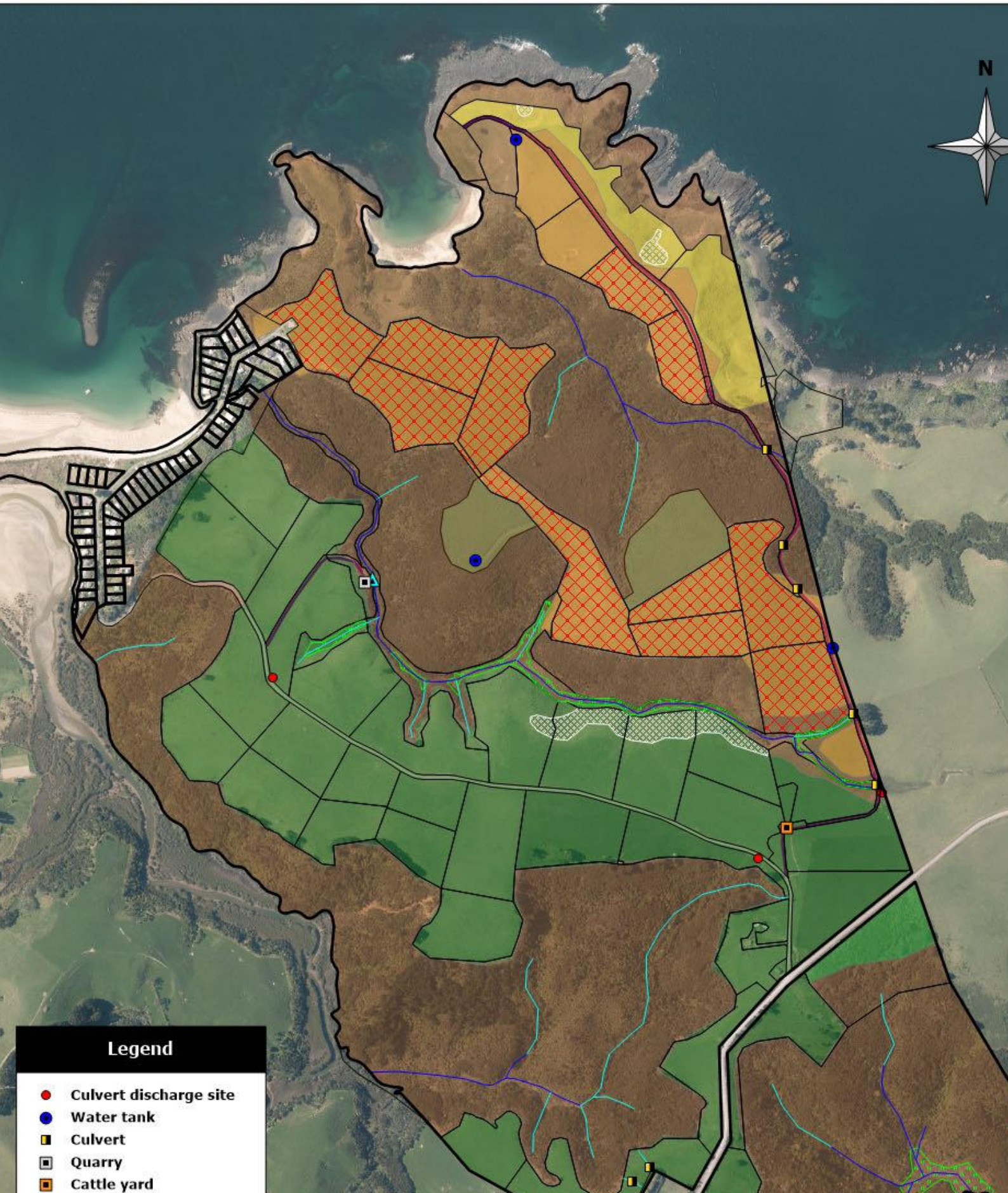
Likelihood of loss = ***Minimal*** (1) and Potential impact = ***Some Impact*** (2) add 1 + 2 = 3. This risk has a total value of 3 which is LOW.
Likelihood of loss = ***Sometimes*** (2) and Potential impact = ***Moderate*** (3) add 2 + 3 = 5. This risk has a total value of 6 which is MEDIUM.
Likelihood of loss = ***Often*** (3) and Potential impact = ***Moderate*** (4) add 2 + 4 = 6. This risk has a total value of 6 which Is HIGH.
N.B. There are instances where the risk matrix might not apply like in the case of effluent entering a waterway if there is any chance of this it will be HIGH

Risks to freshwater and the marine environment on Tapuaetahi.

LMU	Activity or Vulnerability	Map Code	Risk to water	Significance of Risk
Easy Volcanics	Unfenced intermittent waterways	Intermittent waterway	Generating sediment – degrading water quality	Low
Easy volcanics	Actively eroding hillside	Active erosion	Generating sediment – degrading water quality.	Low
Easy volcanics	Culvert discharge	Culvert discharge site	Eroding soil at discharge area generating sediment	Low
Easy volcanics	Open/active quarry close to waterway	Quarry	Sediment runoff from quarry going straight into waterway	Medium
Coastal hills	Erosion	Active erosion	Sedimentation of the marine environment	Medium
Podzols	Pugging by stock	Pug prone soils	Sediment runoff – degrading water quality	Medium

This table is accompanied by the Risk Map on the following page.

Tapuaetahi Land Management Units



8.0 RECOMMENDATIONS AND ACTION PLAN

This section is accompanied by a works and CSA map.

8.1 Volcanics

- Fence small seep that feeds into the wetland to prevent stock trampling damage and sediment generation.
- Consider moving to a split fertilizer application due to the potential high P retention of the volcanic soils.
- Carry out erosion control planting and/or retire area of erosion.
- Plant shade and shelter trees for livestock.
- Consider this unit for any diversification into horticulture

8.2 Podzols

- Keep heavy cattle off this unit during the winter to avoid pugging damage.
- Plant shade and shelter trees for livestock.

8.3 Coastal Hills

- Consider alternative land use options to grazing such as manuka planting, totara forestry or permanent native forest.
- If continuing with grazing fence coastline and plant erosion control trees.
- Consider registration of coastal plantings in the ETS if they meet the regulatory requirements.

8.4 Retired

- Undertake planting to enhance wetlands, riparian zones and erosion prone areas.
- Apply for SHaRP funding to assist with planting.

8.5 Marine Environment

- Purchase a SHMAK from NIWA and continue with waterway monitoring to determine water quality on the whenua and leaving the whenua.
- Investigate SHaRP funding for erosion control on the sandspit and to protect dotterel habitat.

8.6 Recommended Information Sheets

The following publications contain useful information to help in sustainably managing your whenua and farming enterprise.

From the Northland Regional Council (www.nrc.govt.nz): under the land, water and wetlands sections of publications

- Sediment pollution
- Trees for the land
- Poplar and willows for the land
- Best Practice Environmental Guidelines - Land Drainage

From Dairy NZ: Seasonal Nitrogen Use At www.dairynz.co.nz/media/255711/7-11_Seasonal_nitrogen_use_2012.pd

From the Bay of Plenty Regional Council (www.boprc.govt.nz): under knowledge centre/fact sheets

- Farm tracks: Planning, construction and maintenance
- Plant selection for environmental protection areas
- Management of retirement areas
- Runoff management on pastures
- Uses and management of willow species.
- Efficient fertiliser use

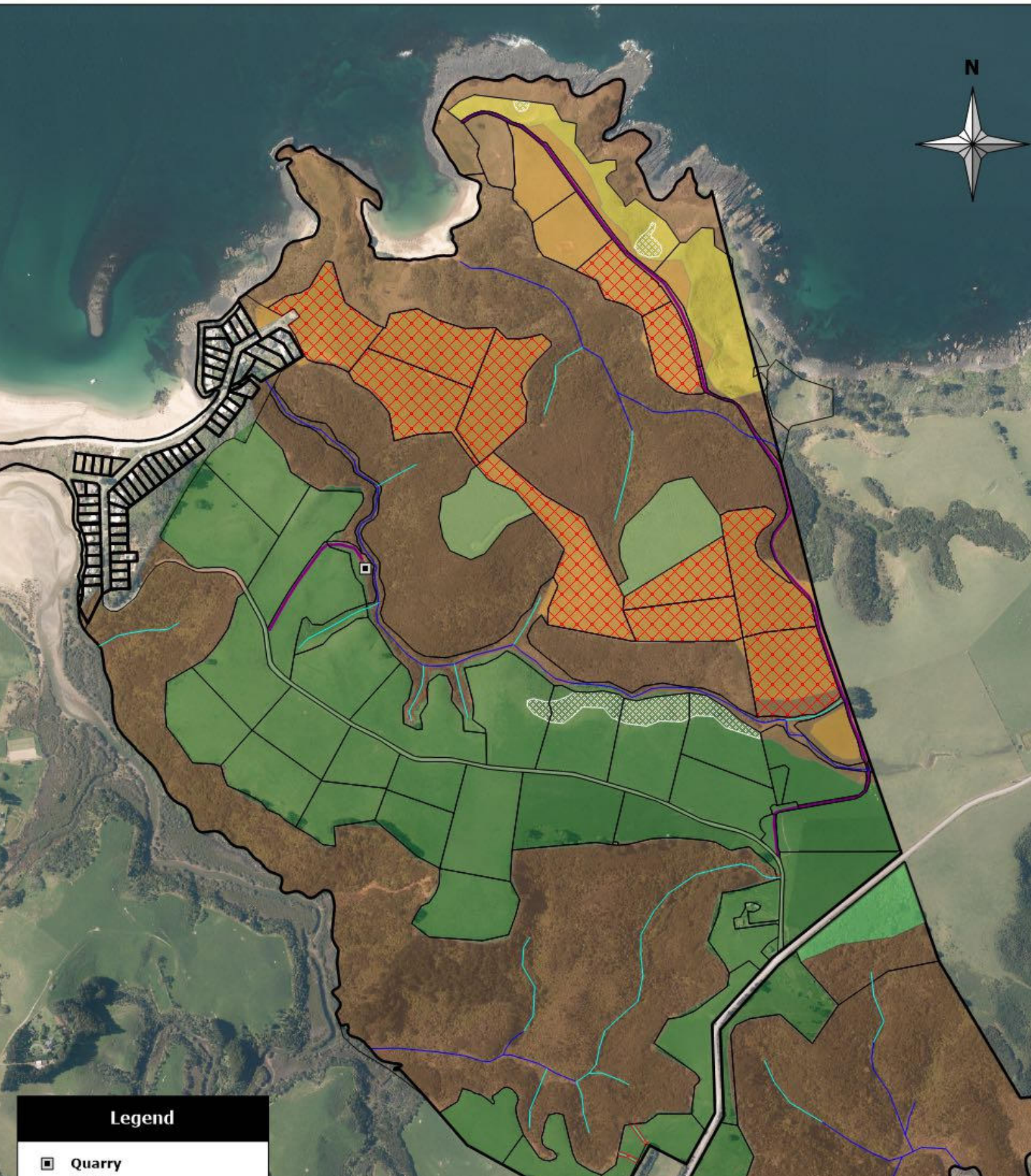
8.7 Actions Plan

Actions required on Tapuaetahi to address the risks to freshwater that have been identified

Map Code	LU	Risk	Action	New/Existing	Action Category	Implementation Timeframe	Regulatory requirement
Intermittent waterway	Easy Volcanics	Low	Exclude stock	New	Catchment action		No
Active erosion	Easy volcanics	Low	Erosion prevention through planting	New	Catchment action		No
Culvert discharge	Easy volcanics	Low	Monitor discharge site – act if erosion begins	New	Catchment action		No
Quarry	Easy volcanics	Medium	Catch any runoff with sediment traps	New	Catchment action		No
Pug prone soils	Podzols	Medium	Stock management	New	Catchment action		No
Active erosion	Coastal hills	Medium	Space plant with poplar poles	New	Supplementary		No

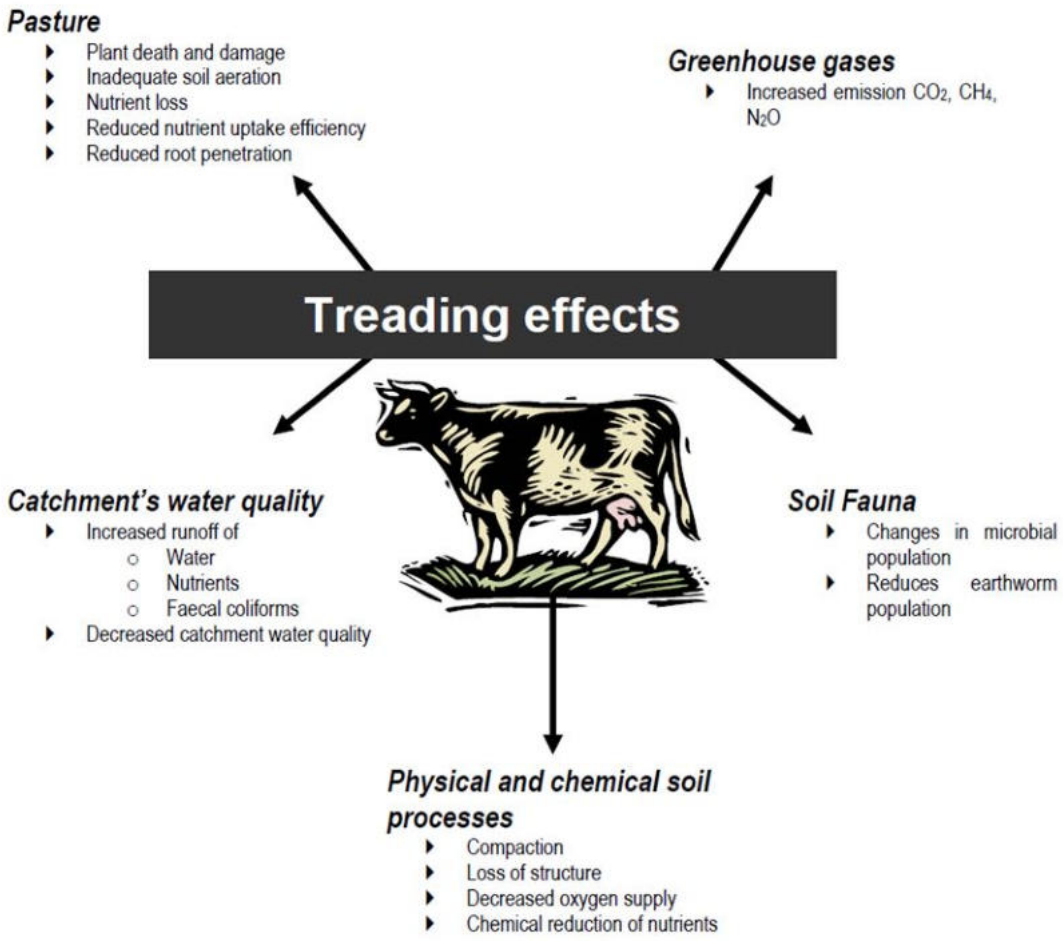
This table is accompanied by the Action Plan Map on the following page.

Tapuaetahi Action Plan



9.0 APPENDICES

9.1 Appendix 1 – The Effects of Pugging

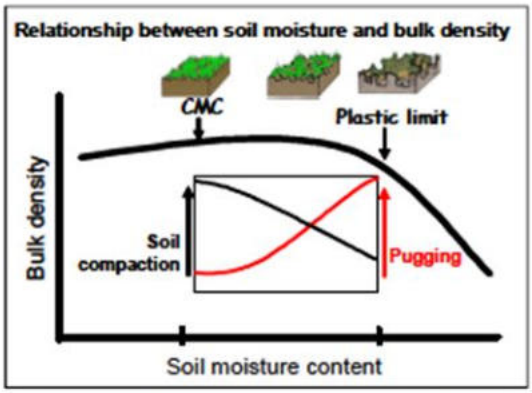


Managing the impacts of Livestock Treading: Both Compaction and Pugging

Soil Characteristics: Soil is comprised of solids, both minerals and organic matter, and pore spaces that contain either water or gases. The aggregation of the minerals and organic matter provide structure that supports the roots and creates the pore spaces.

Macropores (diameter >30 µm) are important for the movement of water and gases in the soil. Micropores (diameter <30 µm) are responsible for water storage. A well-structured soil commonly has a macroporosity of 15 - 20%.

Soils become compacted when physical pressure is applied. They differ in their resistance to compaction because of their difference in texture, mineralogy, organic matter content, and water content.

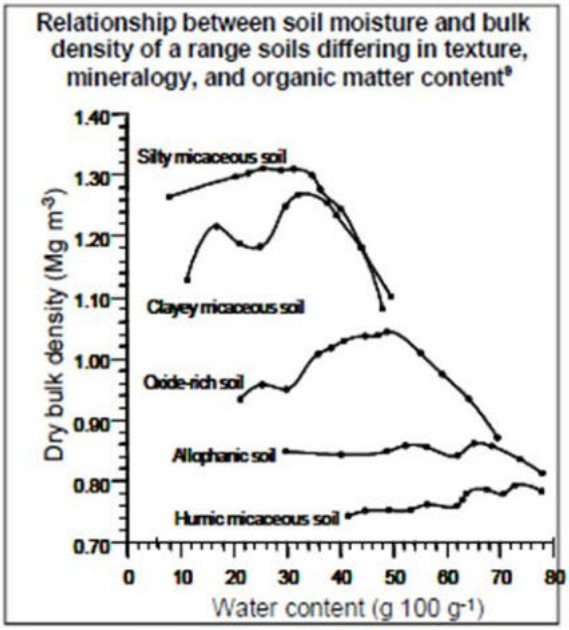


The onset of compaction may not be immediately apparent. The critical moisture content (CMC) of a soil is where maximum compaction occurs and is dependent upon the texture, mineralogy, and organic matter content of the soil. As soil moisture levels increase above the CMC, the hoof penetrates the soil more easily, resulting in deformation or pugging of the soil. In addition to plant damage, a loss of plant number can occur.

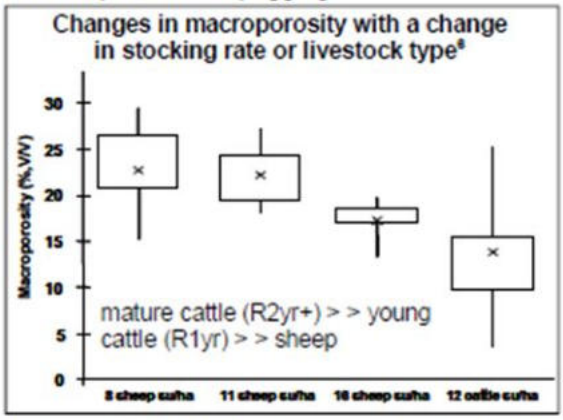
Soil Compaction: Compression of the soil resulting in decreased movement of water and air into and within the soil. The macropores are the first to be lost, when soil is compacted.

Pugging: Deformation of the soil, which results in the loss of pore functions, caused by severe livestock treading. At the moisture content at which pugging occurs, soil compaction is less, because the pores are full of water and cannot be further compressed.

Even apparently 'physically-ideal' soils such as volcanic ash soils are susceptible to long-term effects from compactions and pugging damage.

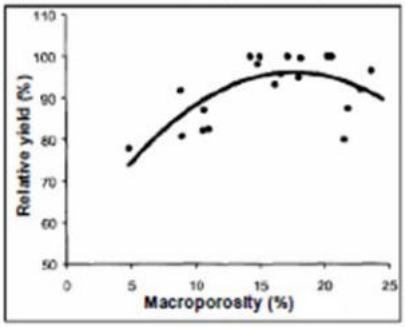


Impact of farming systems: As total animal live weight per ha increases, macroporosity of the soil decreases and soils will become more susceptible to soil compaction and pugging.



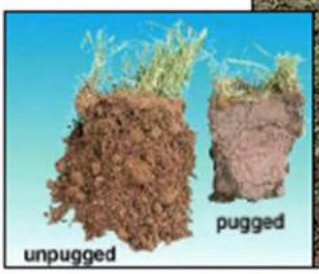
The relationship between macroporosity and plant growth is strong.[4]

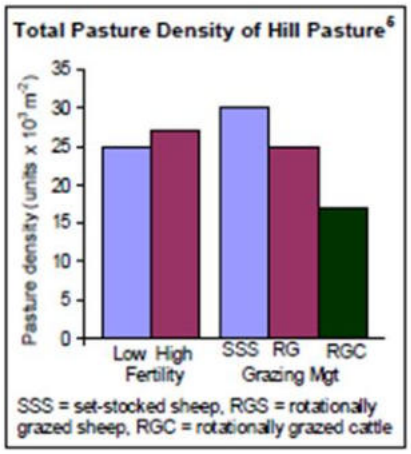
Macroporosity is a better measure of a change in pore function than bulk density.

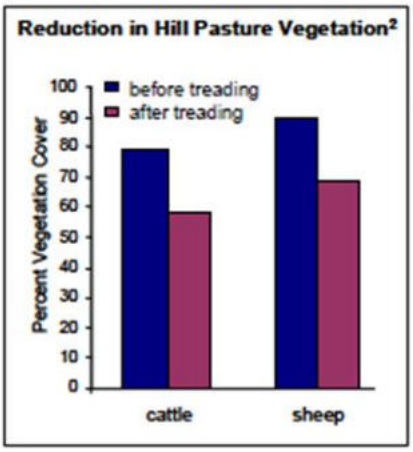


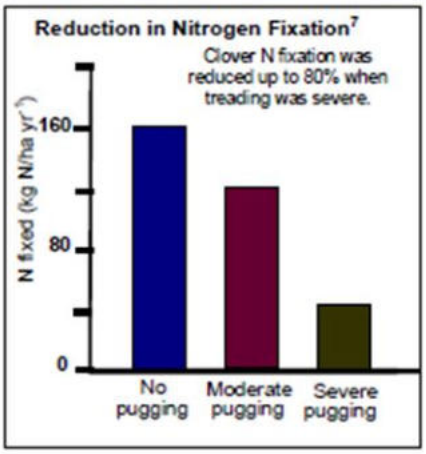
Pasture damage: The potential for pasture damage from pugging increases as the moisture content of the soil increases above the CMC. Additionally, damage due to pugging is increased with increasing stock densities, animal size, and grazing duration. Mature cattle (R2yr+) > > young cattle (R1yr) > > sheep. Pugging results in immediate loss of pasture production, through a loss in plant number, tiller number, and reduction in nitrogen fixation – limits N supply, pasture production (kg of dry matter ha^{-1}) and subsequently animal production.

Depending upon the severity of the treading event, soil texture, pasture characteristics and subsequent management; recovery of pasture growth could take weeks to months. Soil recovery is much slower and may take months to years.



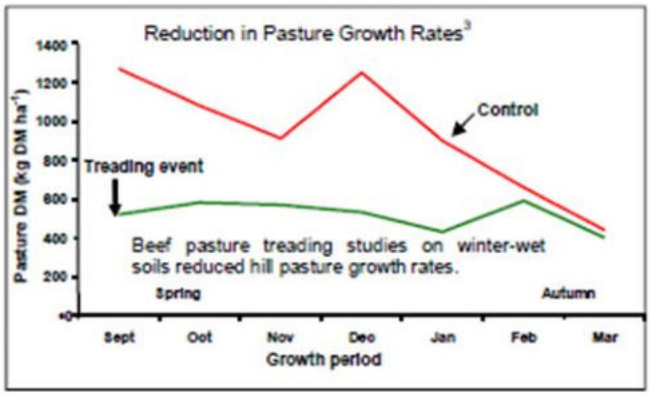


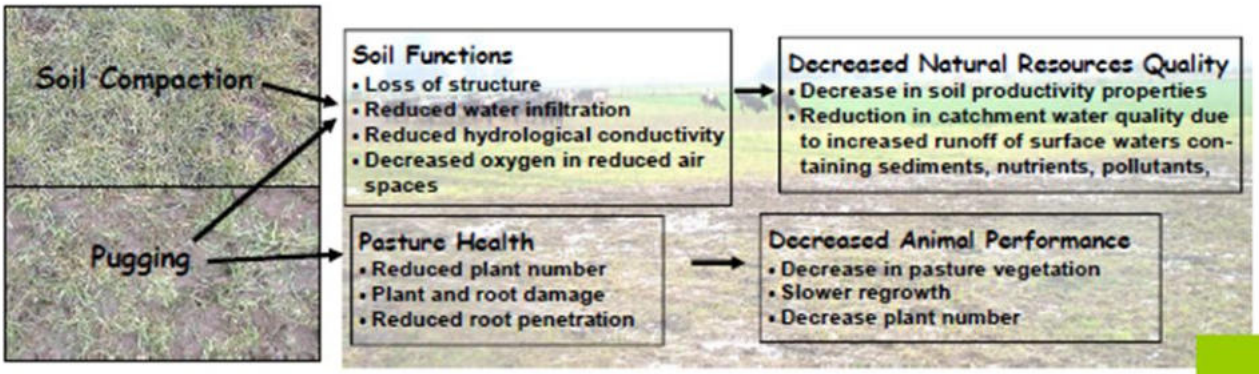




Treading: Research studies found herbage accumulation rates of beef grazed pasture (kg DM/ha/day) was depressed >40% for about 6 weeks following a single severe treading event[8]. Treading effects were similar on hill pasture tracks and slopes and on flat dairy pasture.

Following a severe treading event, a 'break' to allow the pasture to recover may be necessary. Additionally, a change to a lighter animal class or species may be necessary because the soil and pastures are unable to sustain/support heavy weight animals.





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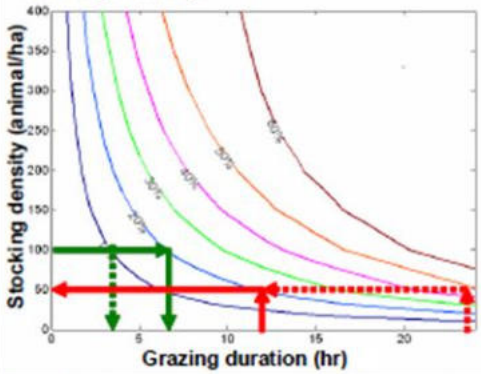
Cost of Treading Damage:

Compacted and pugged soils have notably decreased productivity, but also decreased infiltration rates, greater runoff, and the potential for a greater environmental footprint. As the percent bare ground in the pasture increases with pugging, the chance for nutrient runoff, soil erosion and weed infestations increases.

The TREAD Ready Reckoner is a decision tool that calculates the percent loss of pasture yield potential for the *month* following treading.

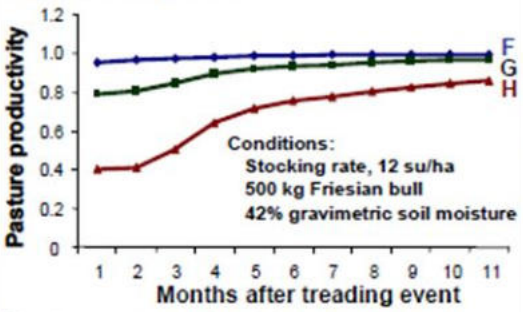


Example 1: If 100 cows/ha remain in an area when the soil is liable to be damaged, after 3.5 hours, 10% of the growth potential would be lost; after 6 hours, 20% of the growth potential will be lost.

Example 2: If cows graze 12 hours and 20% loss of growth potential is acceptable, the stocking rate should be 55 cows/ha. If the 55 cows/has stay for 24 hrs, 50% of the growth potential is lost.

Using TREAD model, the loss of relative potential pasture yield over 11 months was determined for several situations.

Loss of relative potential pasture yield after a single treading event[1]



[1] Treading event occurred on 1 Aug.
F = 100 Friesian bull/ha, grazing for 6 hr; G = 100 Friesian bull/ha, grazing for 12 hr; H = 300 Friesian bull/ha, grazing for 12 hr.

Table 1. Direct and Indirect Costs of Treading

Direct (Consumable) Costs	Cost($)	
Pasture repair		
Rolling hill with cultivation, seed, fertilizer, weed control (cost/ha)	599	A
Steep hill with oversowing, seed, fertilizer, weed control (cost/ha)	353	B
Steep hill with aerial seed, seed, fertilizer, weed control (cost/ha)	320	C
Fencing costs, labour and materials (cost/m)	3	D
Indirect (Resource) Costs, Loss of income	Loss ($/ha)	
No treading damage[1]	0	E
Little treading damage[1], 100 Friesian bulls[3]/ha, grazing for 6 hrs	0	F[2]
Some treading damage[1], 100 Friesian bulls[3]/ha, grazing for 12 hrs, 7% reduction in pasture productivity over a 7 month period, stocking rate reduction of 1 bull/ha	81.73	G[2]
Severe treading damage[1], 300 Friesian bulls[3]/ha, grazing for 12 hrs, bulls replaced with sheep[4] for one year, stocking rate reduction of 4 su/ha, remediation required	593	H[2]

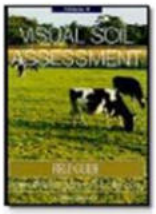
[1] Damaged pasture was defined as pasture productivity less than 95% of production in untreaded pastures
[2] F = 100 Friesian bull/ha, grazing for 6 hr; G = 100 Friesian bull/ha, grazing for 12 hr; H = 300 Friesian bull/ha, grazing for 12 hr
[3] Gross margin, beef - Friesian bulls purchased as weaners, sold at 19-24 month, $81.73/su
[4] Gross margin, sheep - cross bred ewe flock, hill country, $48.47/su

Case Study: Bulls grazing on 100 ha of rolling to level land cause treading damage; 50 % of the area has no damage, 20% of the area has little damage, 20 % of the area has some damage, 10 % of the area has severe damage on rolling hills needing renovation; severely damaged area was fenced. Total cost was calculated using Table 1.

Total cost of damage = 50 ha(E) + 20 ha(F) + 20 ha(G) + 10 ha(H) + 10 ha(C) + 1264 m(D) = 0 + 0 + $1635 + $5930 + $3200 + $3792.

Total cost of damage = $146/ ha

Tools for assessing soil physical conditions:



Visual Soil Assessment (VSA)

The VSA is used to assess the key soil and plant performance indicators of soil quality. Those indicators include the degree of soil erosion, surface relief, topsoil depth, humus type, soil colour and mottling, and earthworm count. A reference sample of soil from under the fence should be used. Ref: The *VSA Field Guide*.

Macroporosity Test:

The soil's macroporosity value is the percentage of the soil volume occupied by large pores that are important for root growth, aeration, and water movement. The sampling tool is used to press the core liner, a plastic ring with a 50 mm diameter, into the soil. The core is removed and sent to be analysed at an appropriate lab. Ref: ***Managing Treading Damage on Dairy and Beef Farms in New Zealand, AgResearch***

Soil Condition Score (SCS):

SCS is based on size of soil aggregates, in a sample from 10-cm depth. A sample with large (> 4 cm) clods that are difficult to break and with few roots penetrating the clod, suggests that soil is compacted and unlikely to withstand treading. With ideal soil conditions the clods easily break and many roots are growing in and around the medium clods. Ref: *Crop & Food Ltd.*

Strategic, long term solutions

Know the soils on the farm: Soils with good drainage, good strength and stable structure and high organic matter levels are more resistant to pugging. Target the more resistant dry soils for grazing during the wet winter months.

Know the impact of animal class or species (mature cattle (R2yr+) > > young cattle (R1yr) > > sheep), stocking density and grazing behaviour on pugging

Establish a grazing strategy

Methods for remediation:

Allow time for the soil and pasture damage to recover

Loosen topsoil using an aerator

Undersow areas with bare soil with forage plants

Use damaged paddocks for growing a summer crop

Remove weeds in damaged area to encourage the spread of pasture species

Tactical, short term solutions

Monitor weather and soil moisture levels.

Maintain good pasture cover and feed supplements to prevent animals milling around.

Reduce effluent applied to pastures leading into winter, keep soil moisture low.

Use the penetrometer for predicting the potential for pugging. If the probe penetrates to a depth of 2 cm or more, within six out of 20 test samples, pugging is likely to occur and the Tread Ready Reckoner should be used to determine optimum livestock management.

Additional Reading on Managing Treading:

Best Management Practice for Grazing Dairy Cows: Using the Dairy Soil Management System, AgResearch

Drewry, J..J. 2006. Natural recovery of soil physical properties from treading damage of pastoral soils in New Zealand and Australia: A review. Agric, Eco, and Env. 114:159-169.

Managing Treading Damage on Dairy and Beef Farms in New Zealand, AgResearch

Soil Science, R.G. McLaren, K.C. Cameron, Oxford Press.

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