

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 Schedule 4). Prior to, and during, completion of this application form, please refer to Resource Consent Guidance Notes and Schedule of Fees and Charges — <u>both available on the Council's web page</u>.

1. Pre-Lodgement Meeting			
Have you met with a council Resource Consent representative to discuss this application prior to lodgement? Yes No			
2. Type of Consent being applied for			
(more than one circle can be ticked):			
Land Use	Discharge		
Fast Track Land Use*	Change of Consent Notice (s.221(3))		
Subdivision	Extension of time (s.125)		
Consent under National Environmental Standard (e.g. Assessing and Managing Contaminants in Soil)			
Other (please specify)			
* 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 If we qualify it will be great to have this.			
4. Consultation			
Have you consulted with lwi/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 <u>tehonosupport@fndc.govt.nz</u>

5. Applicant Details

Name/s:

Email:

Phone number:

Postal address:

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

Angela Vujcich - Advance Build



6. Address for Correspondence

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

Name/s:	CppC Planning - Claire Phillips
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:	James Massey and Jane Alison Massey		
Property Address/ Location:	272 Tauranga Bay Rd, Kaeo		
	Postcode		

8. Application Site Details

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

Name/s: Site Address/ Location:	
	Postcode
Legal Description:	Val Number:
Certificate of title:	

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 rearrange a second visit.

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.

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**

13. Draft Conditions:

Do you wish to see the draft conditions prior to the release of the resource consent decision? () Yes () No

If yes, do you agree to extend the processing timeframe pursuant to Section 37 of the Resource Management Act by 5 working days? **Yes No Unless agreed**

14. 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) Advance Build Ltd - Please use our account

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.

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.



15. 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.

15. Important information continued...

Declaration

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

Name: (please write in full)	Angela Vujcich	
Signature:		Date 11-Jun-2025
	. f the application is made by electronic means	;

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 lwi 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
- **V** 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.



PO Box 550, Warkworth 0941 Mobile: 021 302 340 Email: claire.phillips1@xtra.co.nz Web: www.cppcplanning.co.nz

RESOURCE CONSENT APPLICATION FOR ADVANCE BUILD AT A PROPERTY AT 137 WIROA ROAD, KERIKERI

JUNE 2025

DELIVERING QUALITY PLANNING

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Applicant:	Advance Build		
Owner:	James Massey and Jane Alison Massey		
Site Address:	137 Wiroa Road, Kerikeri		
Legal Description:	Lot 1 DP 141315 and Lot 1 DP 174247		
Site Area:	1.9640 hectares		
Consent:	Land Use		
Activity:	Land use consent for a new prebuilt minor dwelling.		
Operative District Plan: Rural Production Airport Noise Buffer			
Proposed District Plan:	Rural Production Airport Protection Surfaces		
Address for Service:	Claire Phillips Consultant Planner CPPC Planning PO Box 550, Warkworth, 0941, New Zealand Mobile: 021302340 Email: <u>claire.phillips1@xtra.co.nz</u>		

Land use consent is being sought pursuant to section 88 of the Resource Management Act 1991 for a Discretionary Activity to relocate a new pre-built minor dwelling at 137 Wiroa Road, Kerikeri within the Airport noise buffer of Kerikeri Airport.

The proposal involves the following elements:

• A new prebuilt single level minor dwelling with a roof area of 73.5m² and a floor area of 54.2m² will contain a bedroom, bathroom, kitchen and living room. Access to the minor dwelling will be off the same driveway from Wiroa Road as the existing principal dwelling. The minor dwelling in this case is located 45 metres to the principal dwelling.



Figure 1: Perspective of dwelling

- Water supply is proposed by way of one 25,000 litre on-site water tanks.
- Effluent is being treated with a new on-site septic system that has been designed in accordance with TP 58.
- The dwelling is located 677 metres from the runway of the Kerikeri Airport. The dwelling has been designed with double glazed windows and suitable cladding to ensure that any airfield noise is mitigated.

The subject property is currently legally described as Lot 1 DP 141315 and Lot 1 DP 174247 having an area of 1.9640 hectares. Access to the property is from Wiroa Road.

There is an existing dwelling and accessory buildings as well as water tanks and on-site effluent disposal system.

The property contains vegetation both exotic and native, with open grassed areas.



Figure 2: Aerial Photo of Locality – Source – FNDC maps



Photo 1: View of driveway access to property – To service both the existing dwelling and minor dwelling



Photo 2: View of minor dwelling location



Photo 3: View of minor dwelling location



Photo 4: View of minor dwelling location

FAR NORTH DISTRICT COUNCIL – OPERATIVE DISTRICT PLAN

The subject site is zoned Rural Production zone and is within the airport noise buffer area as shown on the portion of planning map below:



Figure 3: Zone Map – Source – Far North Operative District Plan

Chapter 8 – Rural Environment – Section 6 – Rural Production Zone

- Minor residential units are a controlled activity under standard 8.6.5.2.3 in the zone provided that:
 - (a) there is no more than one minor residential unit per site;
 - *(b) the site has a minimum net site area of 5000m²*
 - (c) the minor residential unit shares vehicle access with the principal dwelling;

(d) the separation distance of the minor residential unit is no greater than 30m from the principal dwelling.

In this case, all of the above are met, with the exception of (d), given that the minor dwelling is located 45 metres to the principal dwelling. Consent is therefore deemed to be a discretionary activity under 8.6.5.4(c).

Chapter 15 Transportation – Section 2 Airports

• Any new land use is permitted provided it is not a noise sensitive activity within 1.2km radius of the centreline of the runways at the Kerikeri Airport as outlined in rule 15.2.5.1.2. The proposed dwelling is located 677 metres to the runway at Kerikeri Airport, therefore cannot comply with this rule. Any activity that does not comply with the Rule 15.2.1.2 is a Discretionary Activity under Rule 15.2.5.2.

Overall the proposal is considered to be a Discretionary Activity.

FAR NORTH DISTRICT COUNCIL – PROPOSED DISTRICT PLAN

The Far North Proposed District Plan was notified on July 27, 2022. Only some parts of this plan have legal effects and only those rules where relevant are assessed below.

The subject site is zoned Rural Production and Airport Protection surfaces overlay as shown on the portion of planning map below:



Figure 4: Zone Map Source – Far North Proposed District Plan

Part 2 – District Wide Matters – Natural Environmental Values – Ecosystems and indigenous biodiversity

• IB-R1 states that it is a permitted for vegetation pruning, trimming and clearance provided it is outside the SNA. The site for the minor dwelling is clear of vegetation and is a permitted activity.

Part 2 – District Wide Matters – Natural Environmental Values – Natural Features and Landscapes

• The site is not within an ONL or ONF, chapter not relevant.

Part 3 – Area-Specific Matters – Special Purpose Zones – Airport Zone

• AIRPZ-S2 states that ...All buildings or structures, or extensions or alterations to an existing building or structure and planted vegetation within the airport protection surface areas identified on the planning maps do not penetrate the airport protection surfaces shown in APP4 Airport protection surfaces." This rule however is not operative.

Part 3 – Area-Specific Matters – Zones – Rural Zones – Rural Production

 In reviewing the proposed plan, there are no operative rules that relate to the project under the Rural Production Zone. It is noted that a minor dwelling is controlled activity under RPROZ-R19 provided that it meets the standards in CON-1 – CON-5. It is noted that the proposal would fail to comply with CON-5 as the minor dwelling exceeds 15 metres separation and would be a non-complying activity. However this rule is not operative.

PUBLIC NOTIFICATION ASSESSMENT

ASSESSMENT OF STEPS 1 TO 4 (SECTION 95A)

Section 95A specifies the steps the council is to follow to determine whether an application is to be publicly notified. These steps are addressed in the statutory order below.

STEP 1: MANDATORY PUBLIC NOTIFICATION IN CERTAIN CIRCUMSTANCES

Step 1 states that no mandatory notification is required as:

- the applicant has not requested that the application is publicly notified (s95A(3)(a));
- there are no outstanding or refused requests for further information (s95C and s95A(3)(b)); and
- the application does not involve any exchange of recreation reserve land under s15AA of the Reserves Act 1977 (s95A(3)(c)).

In this case the applicant does not request notification.

STEP 2: IF NOT REQUIRED BY STEP 1, PUBLIC NOTIFICATION PRECLUDED IN CERTAIN CIRCUMSTANCES

Step 2 states that the application is not precluded from public notification as:

- The activities are not subject to a rule or national environmental standard (NES) which precludes public notification (s95A(5)(a)); and
- The application does not exclusively involve one or more of the activities described in s95A(5)(b).

In this case, the proposal is not precluded from notification.

STEP 3: IF NOT PRECLUDED BY STEP 2, PUBLIC NOTIFICATION REQUIRED IN CERTAIN CIRCUMSTANCES

The application is not required to be publicly notified as the activity are not subject to any rule or a NES that requires public notification (s95A(8)(a)).

The following assessment addresses the adverse effects of the activities on the environment, as public notification is required if the activities will have or are likely to have adverse effects on the environment that are more than minor (s95A(8)(b)).

No other effects have been taken into account in this assessment.

STEP 4: PUBLIC NOTIFICATION IN SPECIAL CIRCUMSTANCES

If an application has not been publicly notified as a result of any of the previous steps, then the council is required to determine whether special circumstances exist that warrant it being publicly notified (s95A(9)).

Special circumstances are those that are:

- exceptional, abnormal or unusual, but something less than extraordinary or unique;
- outside of the common run of applications of this nature; or
- circumstances which make notification desirable.

In this instance I have turned my mind specifically to the existence of any special circumstances and conclude that there is nothing exceptional or unusual about the application, and that the proposal has nothing out of the ordinary run of things to suggest that public notification should occur.

EXISTING ENVIRONMENT AND PERMITTED BASELINE

ENVIRONMENT

The 'Environment' includes the 'Existing Environment' which includes all lawfully established activities that exist – and the 'Future Environment' which includes the effects of activities enabled by an unimplemented consent where the consent is 'live' that have not lapsed and there are no reasons why the consent is not likely to be implemented.

These activities and their constituent effects form part of the existing (lawfully established) environment.

In this case the site and locality have been described in the site description above. The site contains the existing shed, water tanks, access and associated on-site effluent disposal.

PERMITTED BASELINE

RMA states that for the purposes of formulating an opinion as to whether the adverse effects on the environment will be minor or more than minor a consent authority may disregard an adverse effect of an activity on the environment if the plan permits an activity with that effect. In this case the site is within Rural Production Zone as well as the Kerikeri Airport Noise Buffer and the following activities are provided for as it relates to this application:

• Buildings that are located 1.2 kilometers from the runway of Kerikeri Airport.

Whilst not a permitted activity, minor dwellings that comply with the standards are a controlled activity, thus Council is going to issue a consent. Notably a minor dwelling within 30 metres of a main dwelling.

UNIMPLEMENTED CONSENTS

There are no known unimplemented consents.

PERSONS WHO HAVE GIVEN THEIR WRITTEN APPROVAL

No persons have provided their written approval to the proposal.

ASSESSMENT OF EFFECTS

Having regard to the above and after an analysis of the application, including any proposed mitigation measures, the adverse effects of the activity on the environment are identified and discussed below.

RURAL CHARACTER AND AMENITY VALUES

The amenity values of an area are those special qualities, in particular natural and physical characteristics that make an area pleasant, unique or different. In this case, the site is within the Rural Production Zone as well as the Kerikeri Airport Noise Buffer. This particular zone is recognized for rural production activities including normal farming and forestry as well as rural and residential lifestyle use.

The rural character of an area is derived from aspects of the surrounding environment such as the amount of open space to buildings, the surrounding activities and infrastructure as well as the predominance of natural features over manmade features, open space and rural elements in the environment.

The proposal involves the construction of a minor dwelling, which in this location is considered to be the type of building and additions characteristic to this locality. The minor dwelling is to be clustered and in close proximity/secondary to the existing dwelling. The minor dwelling is to be constructed out of the similar materials as the existing dwelling and has been located in an existing formed platform that is clear of vegetation and allows the minor dwelling to be sited into the landscape, with a rural backdrop evident.

It is acknowledged that the minor dwelling is 45 metres to the main dwelling, however given the location of existing vegetation and ancillary areas associated with the main dwelling, the proposed location is the best possible outcome for location.

The existing dwelling and location of the proposed minor dwelling is not visible from Wiroa Road given the length of the existing driveway, with screen vegetation providing mitigation from neighbouring sites. Any noise from the minor dwelling will not be audible or over what could be undertaken as a permitted activity.

The proposed minor dwelling maintains a reasonable level of rural-residential amenity and avoids potential reverse sensitivity effects. Given the minor dwelling layout, it is likely to provide accommodation for up to two people.

I am of the opinion that the proposal will generate less than minor adverse rural and landscape character effects and less than minor visual and visual amenity effects given the existing built development in this location.

NOISE

The application site is located within the Kerikeri Airport Noise buffer, with the minor dwelling being located approximately 677 metres from the runway at Kerikeri Airport. The minor dwelling has been designed with double glazed 8.5mm sound stop laminate windows and suitable cladding to ensure that any airfield noise is mitigated. Further the dwelling is to be suitably insulated to a higher grade within the ceiling and walls.

The applicants acknowledge that they are within this noise buffer and understand the reverse sensitivity implications of location of building within this sensitive noise area. The dwelling and associated uses will not impact on the ongoing operation of Kerikeri Airport.

CULTURAL/HISTORIC HERITAGE

There are no known heritage sites or archaeological sites within the area adjacent to the application site. As shown in the map below, there is a history of occupation around the coastal area. There are a variety of structures adjacent to the coastal marine area, such as stairs and paths, with the historical access to the river evident.

In accordance with standard protocols accidental discovery, work must cease immediately, and Council and Heritage NZ notified should any archaeological or heritage site be uncovered during the earthworks. Given this standard and the relatively unlikely nature of any archaeological site being uncovered, it is considered that the effects of the proposal on cultural matters will be less than minor.

The proposal will not result in effects on the cultural or heritage values of the area.

TRAFFIC AND ACCESS EFFECTS

Access to the property is from Wiroa Road.

Construction machinery will be delivered to the site for the earthworks and once the earthworks and associated impervious surfaces are completed the construction machinery will be removed. The traffic movements to and from the site will be minimal and not outside the level anticipated in a Coastal Living zone.

The proposal involves the provision of two car parking spaces.

It is considered that any adverse traffic or roading effects will be less than minor.

SUMMARY

In summary, having assessed the adverse effects of the activity on the environment, it is considered that the proposed new pre-built dwelling with associated access within the airport noise buffer area will have no more than minor adverse effects on the environment.

ASSESSMENT OF STEPS 1 TO 4 (SECTION 95B)

If the application is not publicly notified under s95A, the council must follow the steps set out in s95B to determine whether to limited notify the application. These steps are addressed in the statutory order below.

STEP 1: CERTAIN AFFECTED PROTECTED CUSTOMARY RIGHTS GROUPS MUST BE NOTIFIED

Step 1 requires limited notification where there are any affected protected customary rights groups or customary marine title groups or affected persons under a statutory acknowledgement affecting the land (ss95B(2) and 95B(3)).

The application site is not affected by customary rights.

STEP 2: IF NOT REQUIRED BY STEP 1, LIMITED NOTIFICATION PRECLUDED IN CERTAIN CIRCUMSTANCES

Step 2 describes that limited notification is precluded where all applicable rules and NES preclude public notification; or the application is for a controlled activity (other than the subdivision of land) or a prescribed activity (ss95B(5) and 95B(6)).

The proposal is a Restricted Discretionary activity and there are no rules precluding notification.

STEP 3: IF NOT PRECLUDED BY STEP 2, CERTAIN OTHER AFFECTED PERSONS MUST BE NOTIFIED

Step 2 requires that where limited notification is not precluded under step 2 above, a determination must be made as to whether any of the following persons are affected persons:

- In the case of a boundary activity, an owner of an allotment with an infringed boundary;
- In the case of a prescribed activity under s360H(1(b), a prescribed person; and
- In the case of any other activity, a person affected in accordance with s95E.

The application is not for a boundary or prescribed activity, and therefore an assessment in accordance with s95E is required. This assessment is set out below.

Overall, it is considered that any adverse effects in relation to adjacent properties will be less than minor, and accordingly that no persons are adversely affected.

STEP 4: FURTHER NOTIFICATION IN SPECIAL CIRCUMSTANCES

In addition to the findings of the previous steps, the council is also required to determine whether special circumstances exist in relation to the application that warrant notification of the application to any other persons not already determined as eligible for limited notification.

There are not considered to be any special circumstances that would warrant notification.

SECTION 95E STATUTORY MATTERS

As required by step 3 above, certain other affected persons must be notified, and the following assessment addresses whether there are any affected persons in accordance with s95E. A person is affected if the effects of the activity on that person are minor or more than minor (but not less than minor).

In deciding who is an affected person under section 95E:

Adverse effects permitted by a rule in a plan or NES (the permitted baseline) may be disregarded.

It is considered that there is no useful baseline that can be applied as the land needs to be earth worked to provide building platforms and subdivision of the land would also require resource consent.

The adverse effects on those persons who have provided their written approval must be disregarded.

Because of the minor scale of the proposal no written approvals have been sought for this proposal.

The sections below set out an assessment in accordance with section 95E, including identification of adjacent properties, and an assessment of adverse effects.

ADJACENT PROPERTIES

The adjacent properties to be considered in the limited notification assessment under section 95B and 95E are set out below:

The applicant is undertaking consultation with Far North Holdings Ltd.

No other persons are considered to be adversely affected by the activity because:

- The design of the proposal has been designed to be sympathetic with the rural environment, through nestling into the site. The infringements to standards will not result in a dominant building over and above what would be expected associated with a permitted dwelling. The proposal is considered to be sited in a manner that will not compromise the existing rural and landscape character and amenity values within this particular locality.
- The proposed minor dwelling is to be sited in a manner that will not compromise the existing landscape and rural character and amenity values within this particular locality and finished in appropriate materials to ensure that the building is integrated into this rural locality.
- Subject to the improved insulation within the walls and ceiling, the improved window glazing the dwelling will not result in acoustic implications and are away of the on-going operations of the Kerikeri Airport.

 The proposal retains sufficient separation distances between the neighbouring dwellings (consistent with other locations within this locality) and will not compromise the existing levels of amenity or residential character enjoyed by adjacent properties to a minor or more than minor extent.

SECTION 104 MATTERS

The matters that require consideration in assessing this application are set out in section 104 of the Resource Management Act 1991. These matters include the actual and potential effects of the allowing the activity on the environment and the relevant rules and assessment criteria.

ASSESSMENT CRITERIA

FAR NORTH DISTRICT PLAN

The following assessment criteria are considered relevant to the application and provide a reliable basis to determine the effects of the proposal. As demonstrated above, the proposal is considered to be consistent with these assessment criteria.

11.1	Residential Intensity		
	Requirement	Comment	Compliance
	(a) The character and appearance of building(s) and the extent to which the effects they generate can be avoided, remedied or mitigated, consistent with the principal activity on the site and with other buildings in the surrounding area.	The new minor dwelling and existing dwelling are considered to be secondary to one another and do not appear above the density allowable in this area. The new minor dwelling maintains a reasonable level of rural-residential amenity and avoids potential reverse sensitivity effects. The amenity of the surrounding area is made up of large separation distances and landscaping, as sense of openness and privacy. The additional traffic and noise levels generated from the minor dwelling are unlikely to significantly exceed levels expected from a dwelling activity as well as permitted	Compliant

	rural production activities on a rural site. Overall, it is anticipated that the retention of the existing dwelling and new minor dwelling will not have adverse effects in terms of rural character, scale and amenity values and will be considered less than minor	
(b) The siting of the building(s), decks and outdoor areas relative to adjacent properties and the road frontage, in order to avoid visual domination and loss of privacy and sunlight.	The minor dwelling is to be sited to ensure that they do not visually dominate the road and adjacent properties. Further the scale of the buildings do not result in the loss of privacy or sunlight.	Compliant
(c) The size, location and design of open space and the extent to which trees and garden plantings are utilised for mitigating adverse effects.	The minor dwelling will have sufficient open space areas to enable garden plantings etc.	Compliant
(d) The ability of the immediate environment to cope with the effects of increased vehicular and pedestrian traffic.	It is considered that this community/environment can accommodate the proposed minor dwelling as well as increased vehicular movements.	Compliant
(e) The location and design of vehicular and pedestrian access, on site vehicle manoeuvring and parking areas and the ability of those to mitigate the adverse effects of additional traffic.	Access is located on the existing crossing. The additional vehicle movements can be adequately accommodated within the roading environment. Further there is sufficient car parking and manoeuvring on site.	Compliant

 (f) Location in respect of the roading hierarchy – the activity should be assessed with regard to an appropriate balance between providing access and the function of the road. (a) The extent to which 	Wiroa Road provides access to the site. The proposal rationalises an existing crossing for access, thus protecting the on-going use of the state highway and function.	Compliant
<i>(g) The extent to which hours of operation are appropriate in terms of the surrounding environment.</i>		Compliant
(h) Noise generation and the extent to which reduction measures are used.	No excess noise is envisaged form the residence. The minor dwelling itself is double glazed.	Compliant
(i) Any servicing requirements and/or constraints of the site – whether the site has adequate water supply and provision for disposal of waste products and stormwater.	On site servicing is available.	Compliant
(j) Whether the development is designed in a way that avoids, remedies or mitigates any adverse effects of stormwater discharge from the site into reticulated stormwater systems and/or natural water bodies.	Stormwater will be caught and controlled by way of water tank.	Compliant
(k) The ability to provide adequate opportunity for landscaping and buildings and for all outdoor activities associated with the residential unit(s) permitted on the site.	There is the ability within the site for landscaping if necessary.	Compliant

 (I) The degree to which mitigation measures are proposed for loss of open space and Vegetation. (m)Any adverse effects on the life curporting 	The property will maintain significant open space areas and will not result in the loss of any vegetation. The property is not prime or alite sails being class 2 and 6	Compliant Compliant
capacity of soils.	soils, with the remainder of the property allowing for lifestyle activities.	
(n) The extent of visual and aural privacy between residential units on the site and their associated outdoor spaces.	Visual privacy can be achieved through landscaping if necessary.	Compliant
<i>(o) Visual effects of site layout on the natural character of the coastal environment.</i>	The property is not within the coastal environment.	Compliant
(p) The effect on indigenous vegetation and habitats of indigenous fauna.	There are no indigenous habitats or fauna affected within the site by the proposal.	Compliant
(q) 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.	There are no known natural hazards affecting the proposal.	Compliant
(r) Proximity to rural production activities and potential for incompatible and reverse sensitivity effects.	There are no sensitive activities in the locality.	Compliant
(s) When establishing a minor residential unit	NA	Compliant
(t) With respect to access to a State Highway (SH) that is a Limited Access Road, the effects on the safety and/or efficiency on any SH and its connections to the local roading network and the provision of written	The site is not access from a State Highway or Limited Access Road.	Compliant

		approval from the NZ Transport Agency.		
--	--	---	--	--

15.2.6.2	Noise		
	Requirement	Comment	Compliance
	(a) Whether the proposed land use is a noise sensitive activity which could limit airport operations.	The applicants acknowledge that they are within this noise buffer and understand the reverse sensitivity implications of location of building within this sensitive noise area. The dwelling and associated uses will not impact on the ongoing operation of Kerikeri Airport.	Compliant
	<i>(b) Whether acoustic insulation should be required as a condition of consent.</i>	The application site is located within the Kerikeri Airport Noise buffer, with the dwelling being located approximately 677 metres from the runway at Kerikeri Airport. The dwelling has been designed with double glazed 8.5mm sound stop laminate windows and suitable cladding to ensure that any airfield noise is mitigated. Further the dwelling is to be suitably insulated to a higher grade within the ceiling and walls.	Compliant

OBJECTIVES AND POLICIES

The following objectives and policies are considered relevant when considering this application:

Chapter 8.6 Rural Production Zone

- Objectives 8.6.3
- Policies 8.6.4

The objectives and policies seek to enable the efficient use and development of the Rural Production Zone in a way that enables people and communities to provide for their social, economic, and cultural well being and for their health and safety; to promote the maintenance

and enhancement of the amenity values of the Rural Production Zone to a level that is consistent with the productive intent of the zone.

The proposed minor dwelling is considered modest and appropriate for this Coastal Living and consistent with the above objectives and policies.

Chapter 15.2 Airports

- Objectives 15.2.2
- *Policies 15.2.3*

The objectives and policies seek to maintain the safe and efficient operation of airports in the District. The application site is located within the Kerikeri Airport Noise buffer, with the minor dwelling being located approximately 677 metres from the runway at Kerikeri Airport. The minor dwelling has been designed with double glazed 8.5mm sound stop laminate windows and suitable cladding to ensure that any airfield noise is mitigated. Further the minor dwelling is to be suitably insulated to a higher grade within the ceiling and walls. The applicants acknowledge that they are within this noise buffer and understand the reverse sensitivity implications of location of building within this sensitive noise area. The minor dwelling and associated uses will not impact on the ongoing operation of Kerikeri Airport.

In summary it is concluded that this proposal satisfies the relevant matters requiring consideration under section 104.

FAR NORTH DISTRICT COUNCIL – PROPOSED DISTRICT PLAN

Part 3 – Area-Specific Matters – Special Purpose Zones – Airport Zone

- Objectives TRAN-01 to TRAN-06
- Policies TRAN-P1 to TRAN-P8

The objectives and policies seek to maintain the safe and efficient operation of airports in the District. The application site is located within the Kerikeri Airport Noise buffer, with the minor dwelling being located approximately 677 metres from the runway at Kerikeri Airport. The minor dwelling has been designed with double glazed 8.5mm sound stop laminate windows and suitable cladding to ensure that any airfield noise is mitigated. Further the minor dwelling is to be suitably insulated to a higher grade within the ceiling and walls. The applicants acknowledge that they are within this noise buffer and understand the reverse sensitivity implications of location of building within this sensitive noise area. The minor dwelling and associated uses will not impact on the ongoing operation of Kerikeri Airport.

Part 3 – Area Specific Matters / Zones / Rural Zones / Rural Production

- Objectives PRPOZ-01 to PRPOZ-04
- Policies PRPOZ-P1 to RPROZ-P7

The above objectives and policies seek to ensure that the Rural Production zone is managed ensuring availability of primary production activities, protection of highly productive land, protects reverse sensitivity impacts, does not compromise farming or exacerbate natural hazards. Also seeks to ensure that rural character and amenity values are maintained.

The new minor dwelling maintains a reasonable level of rural amenity and avoids potential reverse sensitivity effects. The amenity of the surrounding area is made up of large separation distances and landscaping, as sense of openness and privacy. The intensity of development will not exceed the allowable building coverage or impervious surfaces. Overall it is considered that the proposal will maintain the intent and direction of the objectives and policies for the Rural Production Zone.

In summary it is concluded that this proposal satisfies the relevant matters requiring consideration under section 104.

NATIONAL POLICY STATEMENTS

THE NATIONAL POLICY STATEMENT FOR ASSESSMENT AND MANAGING CONTAMINANTS TO SOIL

The National Environmental Standard for assessing and managing contaminants to soil to protect human health is relevant to the application. A report by Bay Ecological Consultancy Ltd (Preliminary Site Investigation) which makes the following conclusion ... *It is highly unlikely that there is any risk to human health from the change of use activity, which may proceed as permitted activity in this regard.*

Soil disturbance for the proposed residential occupation is given as 37.17 m³ is within permitted activity limits as per NES- CS Regulation (3)c of 271.65m³."

A consent is therefore considered not to be triggered by this application for a new dwelling and associated earthworks.

THE NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT 2020

The National Policy Statement for Freshwater Management 2020 (NPSFM) came into effect on 3 September 2020 It replaced the first generation NPSFM, most recently amended in 2017. The proposal does not trigger any consents under the NESFM.

THE NATIONAL POLICY STATEMENT FOR HIGHLY PRODUCTIVE LAND 2022

The NPS-HPL came into force on 17 October 2022, with most provisions having immediate effect, placing restrictions on rezoning, subdivision and land-use proposals on land that meets the transitional definition of HPL (Land Use Capability (LUC) classes 1–3, with some exceptions).

The application site has class 3 and 6 soils as per the Our Environment Website, which can be found at the below link.

https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/Iri luc main

Policy 3.9 of the HPS-HPL provides for the protection of highly productive land from inappropriate use and development. In particular the policy states (2) (a) *it provides for supporting activities on the land...* and (g) ... *it is a small-scale or temporary land-use activity that has no impact on the productive capacity of the land..*

The property contains an existing dwelling. The property currently contains some horticulture, with the remainder of the site utilized for rural residential living. Given the size of the property being well below 4 hectares, there is no risk to loss of production as the site is already non-productive in terms of economic factor.

Therefore the proposal does not trigger any consents under this document.

SECTION 104(1)(C) RMA- ANY OTHER RELEVANT MATTER

There is not considered to be any other matter that is relevant and requires consideration in determining this application.

PART II OF THE RESOURCE MANAGEMENT ACT

Part II of the Act sets out the Purpose and Principles. This proposal is in keeping with Part II as the effects of the proposal on the environment will be minor and the proposal will not compromise the ability of this site to be used by existing and future generations, also the life supporting capacity of air, water, soil and ecosystems will not be compromised.

Section 5 of the Resource Management Act 1991 (the Act) describes the Purpose and Principles of the Act and provides a definition of 'sustainable management' which includes reference to managing the use and development of natural and physical resources at a rate that allows people and communities to provide for their wellbeing, whilst avoiding, remedying and mitigating any adverse effects of activities on the environment.

This involves sustaining resource potential (excluding minerals), safeguarding the life supporting capacity of air, water, soil and ecosystems and avoiding, remedying or mitigating adverse effects. The effects of this proposal on the environment have been described above.

The proposal is considered to be consistent with the Purposed and Principles outlined above as the effects on character and amenity will be no more than minor. Further any potential effects can be adequately avoided, remedied and mitigated.

Section 6 of the Act requires all persons exercising functions and powers under the Act to recognise and provide for matters of national importance in relation to the natural character of the coastal environment, wetlands, lakes and rivers and the protection of them from inappropriate subdivision use and development. Outstanding natural features and landscapes are also to be protected from inappropriate subdivision, use and development.

The proposal is considered to be consistent with section 6 of the Act as there are considered to be no matters of national importance on this site.

Section 7 relates to other matters that are to which regard must be had in achieving the sustainable management of natural and physical resources: The proposed shed is considered to be consistent with the provisions of the section of the Act.

Section 8 requires that account shall be taken of the principles of the Treaty of Waitangi. The proposal is considered to be consistent with the matters outlined in Section 8.

Overall, it is considered that the proposal is in keeping with Part II of the Resource Management Act 1991.

CONCLUSION

It is concluded that the proposal to construct a new minor dwelling and associated works within the airport noise buffer will have less than minor adverse effects on the surrounding environment. Further the proposed activity is considered to be in keeping with the relevant assessment criteria, objectives and policies set out in Far North District Plan.

As a result of the above granting consent to this proposal will be in keeping with the provisions set out in Part II of the Resource Management Act 1991 and sections 104 and 104B.


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

IdentifierNA105D/315Land Registration DistrictNorth AucklandDate Issued05 August 1996

Prior References NA106D/949

NA83D/521

Estate	Fee Simple
Area	1.9640 hectares more or less
Legal Description	Lot 1 Deposited Plan 141315 and Lot 1 Deposited Plan 174247

Registered Owners

James Massey and Jane Alison Massey

Interests

Subject to Section 241(2) and Section 242(1) and (2) Resource Management Act 1991

C581456.2 Mortgage of part to The National Bank of New Zealand Limited - 23.3.1994 at 2.58 pm



NA105D/315



NA105D/315



Proposed New Dwelling

137 Wiroa Road, Kerikeri

For: Alice Massey & Lee Caton



P01

Concept Plans Concept 7 April 2025

FINAL WORKING DRAWINGS TAKE PRECEDENCE OVER CONCEPT PLANS, ALL LANDSCAPING. PLANTING, LIGHTING & FENCING IS SHOWN FOR IMAGING PURPOSES ONLY

REVISION: PROJECT NO. DRAWN BY: HC:

Advance build

A smarter move

CONTENTS



C071164 JBD TKD



NB: Boundary Lines are Indicative Only



REVISION:	BY:	DATE:
Drawn	JBD	Sep 5 2022
Rev	JBD	Dec 1 2022
Rev	JBD	Nov 27 2024



Proposed New Home for: Alice Massey & Lee Caton 137 Wiroa Road, Kerikeri

SHEET TITLE: Site Location Plan

SCALE: NTS

PROJECT #: PAGE: REVISION:

1164

01 C07



REVISION:	BY:	DATE:
Drawn	JBD	Oct 25 2022
Rev	JBD	Dec 1 2022
Rev	JBD	Nov 27 2024
Rev	JBD	Dec 3 2024
Rev	KAT	Dec 11 2024
Rev	JBD	Feb 4 2025
Rev	JBD	Mar 5 2025
Rev	JBD	Mar 12 2025
Rev	JBD	Mar 20 2025

SHEET TITLE:
Site Plan





Elevations

REVISION:	BY:	DATE:
Drawn	JBD	Jun 20 2022
Rev	JBD	Oct 17 2022
Rev	JBD	Nov 16 2022
Rev	JBD	Feb 27 2023
Rev	JBD	Nov 25 2024
Rev	JBD	Dec 3 2024
Rev	JBD	Feb 4 2025
Rev	JBD	Feb 25 2025
Rev	JBD	Mar 5 2025
Rev	JBD	Mar 12 2025
Rev	JBD	Mar 20 2025

Verify all dimensions on site before commencing work. Refer to figured dimensions. Refer any discrepancies to Advance manufacturing Ltd.

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Proposed New Home for: Alice Massey & Lee Caton 137 Wiroa Road, Kerikeri

SHEET TITLE: Floor Plan

SCALE: 1:75 (A3 Original)

PROJECT #: PAGE: REVISION:

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REVISION:	BY:	DATE:
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Proposed New Home for: Alice Massey & Lee Caton 137 Wiroa Road, Kerikeri

SHEET TITLE: Elevations

SCALE: 1:100 (A3 Original)

PROJECT #: PAGE:

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03



NOTE:

- Single Phase Mains Power Connection

- Power feed for future Spa pool connection





Electrical Legend				
\square	Single Power Outlet	1		
\Rightarrow	Double Power Outlet	14		
-2	Television Outlet			
	Cat6 Outlet	1		
Θ	Light Switch	12		
Q	Batten Holder Light			
HTR	Heated Towel Rail	1		
lnline Fan		1		
LED Down Light		19		
Dimmer Switch				
	Exterior Wall Light			
HP	Heat Pump			
	Spot Light w/ Sensor	2		
\Box	Sgl Ceiling Power Outlet			
0 WP	Weatherproof Power Outlet	1		
- Pendant Light				
0	Meter Box			
	Distribution Board	1		
SD	Battery Smoke Detector	2		

Notes:

- Allow 3x draw-wires to switchboard for future wiring & septic system

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Rev	JBD	Nov 17 2022
Rev	JBD	Nov 23 2022
Rev	JBD	Nov 27 2024
Rev	JBD	Dec 3 2024
Rev	KAT	Dec 12 2024
Rev	JBD	Feb 4 2025
Rev	JBD	Feb 25 2025
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SHEET TITLE: Electrical Plan

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C07

Floorcoverings

W=Wooden Planking Total Area- 41.35m2

T=Tiles

Total Area- 7.61m2

Interior Door Handles

SL=Sliding PS=Passage PV=Privacy DM=Dummy

Exterior Door Handles KL=Keyed Lock

Ceiling Height 2.4m Flat Ceiling - Throughout

Insulate walls

Truck Direction (Reverse In)

All Exterior Doors Rebated for Flush Entry



NOTE: HWC solar connection to be arranged by Owner

Fit Off Legend	
Level Entry Tile Showers	
Acylic Showers	1
Baths	
Vanities	
Basins	
Toilets	1
Toilet Roll Holders	1
Towel Rails	
Heated Towel Rails	1
Laundry Tub	
Hose Tap	2
Cavity Sliders	1
Privacy Handles	2
Passage Handles	1
Dummy Handles	1
Sliding Handles	2
Robe Shelves & Closet Rail	1
Robemaker Double	1
Robemaker Triple	
Linen Shelves (Per Shelf)	
Linen H Frames	
Door Stops	3
Floor Mounted Door Stops	2
Dishwasher	1
Rangehood	1
Oven	1
Smoke Detectors	2

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Proposed New Home for: Alice Massey & Lee Caton 137 Wiroa Road, Kerikeri

SHEET TITLE: Fittings Plan

SCALE: 1:75 (A3 Original)

pressure cylinder to be restrained with 25×1mm SS steel straps tensioned when fixed in place with drain tray under

1164

PROJECT #:



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C07







drawing title: #5903 AB Massey & Caton

LEGAL DESCRIPTION:

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Kitchen





'Aventos' HK lift up door			
	340 mm	_	
	m		
	1760 m		
nm + 750 mm -		_	
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Laundry





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Onsite Wastewater Report (TP58)

Alice Massey & Lee Caton 137 Wiroa Road Kerikeri Far North District Lot 1 DP 174247

Written by:Nicola O'BrienApproved by:Martin O'Brien

Rev:CDate:19th December 2024Job No:2812

Ph: (09) 407 5208 | Mob: 027 407 5208 E-mail: martin@obrienconsulting.co.nz E-mail: nicola@obrienconsulting.co.nz

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Onsite Wastewater Disposal Design Assessment of the Environmental Effects

Executive Summary

Lot 1 DP 174247 is a 5,433m², roughly square shaped, flat to very slightly sloping section with citrus trees located at 137 Wiroa Road, Kerikeri. The owners propose to construct a 1-bedroom dwelling to the south of the property. Onsite wastewater is required to service the dwelling. An additional bedroom may be constructed in the future. The wastewater design is for 2 bedrooms total with a potential occupancy of 4 people.

A secondary treatment system with surface laid dripper lines on a 100mm (minimum) raised mound of topsoil is recommended due to category 6, soils with slow draining characteristics and a groundwater table ranging from 500 - 1000mm depth (based on 3 bore logs over the property). The field is to be extensively planted with water loving plants and mulched.

Recommendations:

- A secondary treatment system with surface laid dripper lines on a minimum 100mm layer of topsoil is recommended.
- Effluent will be disposed of via a robust secondary treatment system which complies with the New Zealand Building Code. The system is to have a high output quality of: BOD5 equal to or less than 20g/m³ and TSS equal or less than 30g/m³, in line with NZS1546.3:2008 and the New Zealand Building Code.
- The proposed wastewater disposal field shall consist of approximately 240m of surface laid dripper line spaced at 1m. 240m² area in total. Dripper lines are to be surface laid, on a 100mm (minimum) raised mound of topsoil, and extensively planted with water loving plants. The dripper line is to be covered by at least 100mm of mulch.
- The wastewater field is to be setback a minimum 5m from any existing or future intermittent stormwater flow path downslope of the field. This includes a 5m minimum setback from existing drains.
- There is adequate area to support a 100% reserve wastewater disposal field.
- The owner is to obtain a maintenance agreement from the manufacturer on purchase of the system. Aeration treatment systems should have an annual maintenance agreement with the supplier as stated in the Far North District Council bylaw 2805.2. This ensures the system operates efficiently and is serviced regularly.
- Correct use and maintenance of the wastewater system is required for it to work effectively and minimise environmental impacts.

1.0 Introduction

1.1 Scope

An on-site effluent disposal investigation, to obtain building consent, has been undertaken in accordance with TP58 On-site Wastewater Systems: Design and Management Manuel Third Edition (2004), Regional Plan for Northland (2019) and the Far North District Plan (2009). An onsite wastewater treatment system and land application method are recommended based on site characteristics including setback distances from surface water, groundwater, and soil type. A wastewater design is provided based on aforementioned documents and site characteristics.

1.2 Proposal

A secondary treatment system with surface laid dripper lines is proposed to service a 2-bedroom dwelling (includes possible future bedroom for wastewater calculations).

1.3 Site Description

Lot 1 DP 174247 is located at 137 Wiroa Road, Kerikeri and is zoned Rural Production in the Far North District Plan. Access to the property is gained via 137 Wiroa Road which runs along the northwest boundary. Refer to the Northland Regional Council (NRC) Property Map, Section 1.4, showing Lot 1 DP 174247 and the surrounding area.

Lot 1 is a roughly square shaped, flat to very slightly sloping section with citrus trees and shelter belt as shown in Photograph 1. In the area proposed for wastewater disposal the trees are to be removed and the area to be covered with a raised mound 100mm (minimum) of topsoil. The field is to be planted extensively with water loving plants.

Drains have been installed on the property to improve drainage. Drains run along the southeast and northeast property boundaries and through the middle of the section. A drain runs along Wiroa Road, and a shallow recess/drain runs along the right of way along the southwest boundary. The wastewater disposal field is to be situated a minimum 5m from any existing or future intermittent stormwater flow path downslope of the field as per the Regional Plan for Northland (2019), Section C.6.1.3, Table 9. This includes a 5m setback from all existing and future drains. Refer to the Site Plan, Section 8 showing the location of drains and setback requirements.

A 1.5m setback from boundaries and buildings is required as per TP58, (2004), Table 5.2. A 3m setback of the system from buildings is recommended. Refer to TP58, (2004), Table 5.2, The Regional Plan for Northland, (2019), Section C.6.1.3 and the Far North District Plan, Section 12.7.6.1.2, 12.7.6.1.4(b) for all wastewater setback requirements. The Site Plan, Section 8 shows the location of the proposed field and reserve along with setback requirements specific to the site.



Photograph 1: Showing existing citrus trees and shelter belt on the flat to slightly sloping site.

1.4 Northland Regional Council Map



2.0 Methodology

2.1 Site Visit

The site investigation was undertaken on 6th September 2022 and comprised of a visual assessment of the proposed wastewater disposal field and the surrounding area. 3 x 50mm boreholes were taken to acquire soil samples and to establish groundwater depth. USDA feel method was used to determine soil texture, soil structure and soil category. The test location is indicated on the attached Site Plan, Section 8.

2.2 Desk Study

A desk study of available information and site characteristics was undertaken. The following sources were reviewed, TP58 (2004), Regional Plan for Northland (2019), Section C.6.1.3, Far North District Plan, Section 12.7.6.1.4(b), Far North and Northland Regional Council Maps, Whangaroa - Kaikohe Soil Map and Google Earth images.

3.0 Site Evaluation

3.1 Soil Profile

Geological Map Reference Number: NZMS 290 Sheet P 04/05 describes the soils over the property as Okaihau gravelly friable clay (OK) with well to moderately well drained soils of the rolling and hill land.

The borehole logs showed soils to be category 6 clay with slow draining characteristics. Refer to the Borehole Logs, Section 9 and Photograph 2 showing soil layers.



Photograph 2: Borehole 3 showing 300mm of category 5, slightly moist, brown topsoil followed by category 5, moist, brownish orange, silty clay to a depth of 600mm. From 600mm soils were moist, category 6, orange, silty clay. Soils were saturated with groundwater at this location at 1000mm depth.

3.2 Groundwater

The Regional Plan for Northland (2019), Section C.6.1.3, Table 9 requires a 600mm separation distance of secondary treated wastewater from groundwater. TP58 (2004), Table 5.2 recommends a more conservative separation distance of 900mm in category 6 soils.

3 Boreholes were taken due to the interception of groundwater at 500mm depth (BH 1). Borehole 1 showed groundwater at 500mm depth, BH 2 at 600mm depth whilst the 3rd log found groundwater at 1000mm depth (BH 3). Refer to the Site Plan, Section 8 showing the location of the bore logs and the Borehole Logs, Section 9. The tests were taken following a period of prolonged heavy rain during Spring, 6th September 2022. As the groundwater fluctuates over the site the 500mm reading is taken. A 100mm layer of topsoil is required over the area to ensure a separation distance of 600mm is achieved. Lines are to be surface laid.

No freshwater bores were noted on NRC Water Resources map in the near vicinity of the proposed wastewater disposal field meeting the 20m setback from a freshwater bore required by the Regional Plan for Northland (2019), Section C.6.1.3, Table 9. The closest mapped active bore is located approximately 350m to the southeast on neighbouring Lot 2 DP 198777.

3.3 Surface water

No surface water bodies were noted in the near vicinity of the proposed wastewater disposal field (30m radius) meeting the 15m separation distance required by the Regional Plan for Northland (2019), Section C.6.1.3, Table 9 and the more conservative 30m separation distance outlined in the Far North District Plan, Section 12.7.6.1.4(b).

The wastewater disposal field and reserve are to be setback a minimum 5m from any existing or future intermittent stormwater flow path such as an overland flow path, drain or stormwater spreader as per the Regional Plan for Northland (2019), Section C.6.1.3. A 5m setback is required from all existing drains shown on the Site Plan, Section 8.

3.4 NRC Hazard Map - Flooding

According to Northland Regional Council maps the property is not identified as being in a flood area.

4.0 On-site Effluent Disposal Design

4.1 System Requirements

Effluent will be disposed of via a robust secondary treatment system which complies with the New Zealand Building Code. The system is to have a high output quality of: BOD5 equal to or less than 20g/m³ and TSS equal or less than 30g/m³, in line with NZS1546.3:2008 and the New Zealand Building Code. The system is to have emergency storage and be fitted with an alarm to protect against system failure.

The owner is to obtain a maintenance agreement from the manufacturer on purchase of the system. Aeration treatment systems should have an annual maintenance agreement with the supplier as stated in the Far North District Council bylaw 2805.2. This ensures the system operates efficiently and is serviced regularly.

The system is to be installed by a registered installer to manufacturer's instructions. It is imperative that a maintenance contract be obtained at the point of installation to avoid problems with the system. Installation and maintenance notes can be found at the back of this report, Section 10 and 11.

Proposed system: Econotreat VBB-P-2000 (plastic) or Econotreat VBB-C-2000 (concrete)



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4.2 Proposed Effluent Disposal Field

Wastewater calculations as follows:

Potential occupancy of the dwelling with a future bedroom x litres per person per day / loading rate = area of wastewater field

4 x 180 litres / 3 = 240m²

The proposed effluent field shall consist of approximately 240m length of surface laid dripper line spaced at 1m in a 240m² area. Dripper lines are to be surface laid on a 100mm (minimum) mound of level topsoil and planted extensively with water loving plants. Section 10.3 provides a list of native NZ plants suitable for wastewater disposal fields. Dripper line should be covered by at least 100mm layer of mulch or leaf litter. Refer to the attached Site Plan, Section 8.

The wastewater disposal field should not be grazed, driven on or built over. These activities can result in damage to and failure of the effluent field.

180 litres of wastewater produced per person per day with tank water is allocated, in line with TP58 (2004), Table 6.2, p.52. A loading rate of 3 is assigned due to category 6 soils with slow draining characteristics as per TP58 (2004), Table 9.2, p.150.

Installation and maintenance notes can be found at the back of this report, Section 10 and 11, as a guide to the upkeep of the system and disposal field.

4.3 Reserve Area

The site has adequate area to support a 100% reserve wastewater disposal field, greater than the 30% minimum required by the Northland Regional Plan (2019). The purpose of the reserve is to provide additional area for wastewater disposal, for example in the event of failure of the original field or future expansion of the proposed development. The reserve disposal field must be protected from any development that would prevent its use in the future.

4.4 Stormwater Management

The property does not benefit from a connection to the town main water supply. Stormwater from the roof of the dwelling will be collected in a water tank. The overflow from the tank is to be directed well away from the proposed wastewater disposal field.

The property is flat with high groundwater. Drains have been installed on the property to improve drainage. A drain runs along Wiroa Road, and a shallow recess/drain runs along the right of way along the southwest boundary.

A cut of drain is not required due to existing drains and flat topography.

5.0 Council Requirements for new Building Consents

5.1 Smoke Alarms

Smoke alarms shall be installed in accordance with the New Zealand Building Code. This is a requirement by the Far North District Council for all new Building Consents. Interconnected smoke alarms as per NZS 4514:2021 are required as per NZ Building Code - Smoke Alarm Requirements | Cavius NZ, NZ-Building-Code.pdf (cavius.co.nz).

5.2 Earthworks

The proposed works which are being proposed will comply with Earthworks EW-S3 Accidental Discovery Protocol and Earthworks EW-S5 Erosion and Sediment Control – Auckland Council Guideline Document GD005 GD05 Erosion and Sediment Control. Pdf (aucklanddesignmanula.co.nz).

5.3 Hazardous Activities and Industries List (HAIL)

A Preliminary Site Investigation report is not currently available for Lot 1 DP 174247.

6.0 Summary

A secondary treatment system with 240m² of surface laid dripper lines on a minimum 100mm mound of topsoil is recommended due to category 6 soils with groundwater ranging from approximately 500-1000mm depth. The field is to be extensively planted with water loving plants. A 100% reserve area is available.

Setback distances from surface water and intermittent stormwater flow paths have been achieved. With the addition of 100mm (minimum) of topsoil groundwater separation will be achieved.

7.0 TP58 3rd Edition, Appendix E

PART A: Owners Details

1. Applicant Details:

Applicant Name:	Alice Massey & Lee Caton
Company Name:	
Property Owner Name:	Alice Massey & Lee Caton
Nature of Applicant	Owners

2. Consultant / Site Evaluator Details:

Consultant/Agent Name	O'Brien Design Consulting Ltd	
Site Evaluator Name	Martin and Nicola O'Brien	
Postal Address	O'Brien Design Consulting Ltd	
	153B Kerikeri Inlet Road	
	Kerikeri	
Contact Details	Phone	09 407 5208
	Mobile	027 4075208
Name of Contact Person	Martin O'Brien	
E-mail Address	nicola@obrienconsulting.co.nz	
Website	www.obriendesignconsulting.co.	nz

3. Are there any previous existing discharge consents relating to this proposal or other waste discharge on this site?

No	

4. List any other consent in relation to this proposal site and indicate whether or not they have been applied for or granted?

None	

PART B: Property Details

1. Property for which this application relates:

Physical Address of Property	137 Wiroa Road		
	Kerikeri		
Territorial Local Authority	Far North District Co	uncil	
Regional Council	Northland Regional	Council	
Legal Status of Activity	Permitted: V	Controlled:	Discretionary:
Relevant Regional Rule(s) (Note 1)			
Total Property Area (m ²)	5,433m ²		

2. Legal description of land (as shown on Certificate of Title)

Lot No.	Lot 1	DP No.	DP 174247	CT No.	
Other:					

Please ensure copy of Certificate of Title is attached

PART C: Site Assessment - Surface Evaluation

Has a relevant property history study been conducted?

Please Tick No V Yes

If yes, please specify the findings of the history study, and if not please specify why this was not considered necessary.



1. Has a <u>Slope Stability</u> Assessment been carried out on the property?

Please tick	No	V	Yes	
If No, state why?				
The slope in the area of the proposed wastewater disposal field is flat to slight at <3° and showed no sign of				
slippage or instability.				
If Yes, please give detai	ls of report (and if possib	ole, please attach report)	: fill out if you said yes	
Author:				
Company/Agency:				
Date of Report:				
Brief Description of Rep	oort Findings: -			

2. <u>Site Characteristics:</u>

Provide descriptive details below:
Performance of Adjacent Systems:
Unconfirmed.
Estimated Rainfall and Seasonal Variation:
Information available from N.I.W.A MET RESEARCH
Northland = 112.6mm average per month during 1981-2010
Vegetation / Tree Cover:
Grass.
Slope Shape: (Please provide diagrams)
Flat to very slightly sloping.
Slope Angle:
<3°
Surface Water Drainage Characteristics:
A flat to very slightly sloping property. Existing drains will assist in diverting stormwater away from the
development following heavy rain events.
Flooding Potential: YES/NO
No.
Surface Water Separation:
Refer to Section 3.3

3. Site <u>Geology</u>

Okaihau gravelly friable clay (OK) with well to moderately well drained soils of the rolling and hill land.

Geological Map Reference Number	NZMS 290 Sheet P 04/05
---------------------------------	------------------------

4. What <u>Aspect(s)</u> does the proposed disposal system face?

North	V	West	
Northwest		Southwest	
Northeast		Southeast	
East		South	

5. <u>Site clearances</u>

Separation Distance from	Treatment Plant Separation Distance (m)	Disposal Field Separation Distance (m)
Boundaries	1.5m minimum	1.5m minimum
Stormwater flow paths e.g. drains	5m minimum	5m minimum
Surface water	15m minimum	15m minimum
Groundwater	-	0.9m minimum
Stands of trees/shrubs	Outside tree canopy	Within or outside tree canopy
Wells & potable water bores	20m minimum	20m minimum
Lakes, rivers, wetland & the coastline	30m minimum	30m minimum
Buildings	3m minimum	1.5m minimum
Flood area	Ensure sealed unit no setback	Outside the 100yr ARI flood event
Other:		

PART D: Site Assessment - Subsoil Investigation

1. Please identify the soil profile determination method:

Borehole	Hand Augured	1200mm deep	No of Boreholes	1
Other:	USDA feel method to determine soil texture and soil			
Soil Report attached?				
Please Tick	Yes	V	No	

2. Was fill material intercepted during the subsoil investigation?

Please Tick	Yes	No	V	
If yes, please specify the effect of the fill on wastewater disposal				

3. Percolation Testing (mandatory and site specific for trenches in soil type 4 to 7)

Not required			
Test Report Attached?	Yes	No	V

4. Are surface water interception/diversion drains required?

Please tick	Yes		No	V
A cut off drain is not required due to flat topography and existing drains.				

4a. Are subsurface drains required?

Please tick Yes No	٧
--------------------	---

5. Please state the depth of the seasonal water table:

Winter	~500 - 1000mm
Spring	~500 -1000mm
Summer	>1000 mm
Autumn	>1000 mm

Measured		Estimated	٧
Measured	V	Estimated	
Measured		Estimated	V
Measured		Estimated	V

6. Are there any potential storm water <u>short circuit paths</u>?

Please Tick	Yes	No	٧

7. Based on results of subsoil investigation above, please indicate the disposal field soil category

Is Topsoil Present? Yes		Yes	If so, Topsoil Depth?	300mm
Soil Category	Description		Drainage	Tick One
1	Gravel, coar	se sand	Rapid draining	
2	Coarse to medium sand		Free draining	
3	Medium-fine & loamy sand		Good drainage	
4	Sandy loam, loam & silt loam		Moderate drainage	
5	Sandy clay-loam, clay loam & silty clay-loam		Moderate to slow drainage	
6	Sandy clay, non-swelling clay & silty clay		Slow draining	٧
7	Swelling clay, grey clay, hardpan		Poorly or non-draining	

Reasons for placing in stated category

During the borehole logs approximately 300mm of category 5, slightly moist, brown topsoil was noted followed by
category 5, moist, brownish orange, silty clay to a depth of 600mm. From 600mm soils were moist, category 6,
orange, silty clay. Soils are described as slow draining.

PART E: Discharge Details

1. Water supply source for the property:

Rainwater (roof collection)	V
Bore/well	
Public supply	

2. Calculate the maximum daily volume of wastewater to be discharged, unless accurate water meter readings are available (Refer TP58 Table 6.1 and 6.2)

Number of Bedrooms – dwelling	2	(Possible future bedroom included)
Design Occupancy	4	(Potential number of people)
Per capita Wastewater Production	180	(Litres per person per day)
Total Daily Wastewater Production	240	(Litres per day)

3. Do any special conditions apply regarding water saving devices?

a) Full Water Conservation Devices?	Yes		No	v	(Please tick)
b) Water Recycling - what %?	0%				(Please tick)
If you have answered yes, please state what cor	nditions apply ar	nd include	e the estim	ated reduction ir	n water usage:

4. Is Daily Wastewater Discharge Volume more than 2000 litres:

Please tick	Yes		No	V
Note if an average to the scheme is used on N.D.C. was to water discharge a service to service d				

Note if answer to the above is yes, an N.R.C wastewater discharge permit may be required

PART G: Secondary and Tertiary Treatment

1. Please indicate the type of additional treatment, if any, proposed to be installed in the system:

Secondary Treatment			
Home aeration plant	V	Refer to Section	4.2
Tertiary Treatment			
Ultraviolet disinfection			
Other		Specify	

PART H: Land Disposal Method

1. Please indicate the proposed loading method:

Gravity	
Dosing Siphon	
Pump	٧

2. High water level alarm to be installed in pump chambers

Please tick	Yes	V	No	
If not to be installed, explain why:				

3. If a pump is being used, please provide the following information:

Total Design Head	32	(m)
Pump Chamber Volume	150	(Litres)
Emergency Storage Volume	1000	(Litres)

4. Please identify the type(s) of land disposal method proposed for this site:

Surface Dripper Irrigation	V	
Sub-surface Dripper Irrigation		
Mound with Dripper Irrigation		A

s Per Attached Plan

at 1m at 1m

5. Please identify the loading rate you propose for the option selected in Part H, Section 4 above, stating the reasons for selecting this loading rate:

Loading Rate	3		(Litres/m²/day)
Disposal Area	Design (m²)	240	For driplines spaced
	Reserve (m ²)	240	For driplines spaced

Explanation (*Refer TP58 Sections 9 and 10*)

Loading rate of 3 due to category 6 soils with slow draining characteristics as per TP58 (2004), Table 9.2, p.150.

6. What is the available reserve wastewater disposal area

(Refer TP58 Table 5.3)

Reserve Disposal Area (m ²)	240	For dripper lines spaced at 1m
Percentage of Disposal Area (%)	100%	

7. Please provide a detailed description of the design and dimensions of the disposal field and attach a detailed plan of the field relative to the property site:

Description and Dimensions of Disposal Field:

Refer to Proposed Wastewater Disposal Field, Section 4.2 and the Site Plan, Section 7.						
Plan Attached?	Yes	٧	No		(Please tick)	

PART I: Maintenance & Management

(Refer TP58 Section 12.2)

1. Has a maintenance agreement been made with the treatment and disposal system suppliers?

Please tick	Yes	No	V

The owner is to obtain a maintenance agreement from the manufacturer on purchase of the system. Aeration treatment systems should have an annual maintenance agreement with the supplier as stated in Far North District Council bylaw 2805.2. This ensures the system operates efficiently and is serviced regularly. *Client to enter into agreement with chosen system supplier as per FNDC bylaw*

PART J: Assessment of Environmental Effects

1. Is an assessment of environmental effects (AEE) included with application? (*Refer to TP58 Section 5. Ensure all issues concerning potential effects addressed*)

Please tick Yes V No

PART K: Is Your Application Complete?

1. In order to provide a complete application have you remembered to:

Fully Complete this Assessment Form	٧
Include a Location Plan and Site Plan (with Scale Bars)	v
Attach an Assessment of Environmental Effects (AEE)	V

2. Declaration

I hereby certify that, to the best of knowledge and belief, the information given in this application is true and complete.

Name: Martin O'Brien	Signature	MOIS
Position: Director	Date	19 th December 2024

Note:

Any alteration to the site plan or design after approval will result in noncompliance.

Building consent must be approved before work commences.



NOTES

- 1. Contour lines at 1m increments, sourced from NRC .
- All drainage to comply with AS/NZS3500 & NZBC G13/AS1. All drainage is diagrammatical, drainlayer to determine on site drainage layout and provide asbuilt plan when complete.
- Length of dripper lines to be no more than 100m between feed points.
- 4. Dripper lines to follow contour lines
- 5. Dripper lines to be setback:
- 1.5m from buildings
- 1.5m from property boundaries
- 5m from any intermittent storm water flow path such as a drain or overland flow path down slope of the field
- Smoke alarms to be installed to NZS 4514:2021, refer to TP58 report for details.
- The works which are being proposed will comply with Earthworks EW-S3 Accidental Discovery Protocol and Earthworks EW-S5 Erosion and Sediment Control - Auckland Council Guideline Document GD005 GD05 Erosion and Sediment Control.pdf (aucklanddesignmanual.co.nz)

Verify all dimensions on site before commencing work & do not scale from drawings. Refer any discrepancies to O'Brien Desig Consulting Ltd.

All work to be done in accordance with NZS 3604: 2011 and the NZ Building Code unless specifically designed.

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T 09 407 5208 | martin@obrienconsulting.co.nz

- Alice Massey & Lee Caton 137 Wiroa Road Kerikeri
- Lot 1 DP 174247

Sheet Title

Site Plan

Drawn Project No

2812

10 December 2024

			-
θV		Sheet	
С		A	01
Scale (A3	Origin	^{ial)} 1:	250
2.5 1.25	0	2.5	5

Aeration treatment system with power cable from house





- 1. All drainage is diagrammatical, do not scale from drawing.
- 2. Length of dripper lines to be no more than 100m between feed points.
- 3. Dripper lines to follow contour lines
- 4. Dripper lines to laid on even ground, laying dripper lines on gully's or humps in the ground can cause ponding.
- 5. Air release valve to be at the high point in the disposal field or at the system if that is a higher elevation, locations shown on detail are indicative.
- The works which are being 6. proposed will comply with Earthworks EW-S3 Accidental Discovery Protocol and Earthworks EW-S5 Erosion and Sediment Control -Auckland Council Guideline Document GD005 GD05 Erosion and Sedimen Control.pdf (aucklanddesignmanual.co.nz)



9.0 Borehole Logs

O'BRIEN DESIGN CONSULTING BOREHOLE LOG					9 1	WWW disk got as	
Client		Alice Massey & Lee Caton		Job No.	2812		
Project		Installation of onsite wastewater		Date Drilled	6/09/2022		
Site Address		137 Wiroa	Road, Kerikeri	Drilled By	M O'Brien		
Legal Description		Lot 1 DP 1	74247	Drill Method	50mm hand auger		
Depth mm	GWL	Soil Map Reference	Graphic Log	Field D	Description	Soil Category	
100		_					
200	d e	elly OK)		Slightly moi	st brown topsoil	5	
300	dwat epte	grav ay ((
400	ound	au g e clà					
500	int Gr	caih iabl		Moist brownish	orange silty CLAY	5	
500		ο Ξ		Saturated orange silty CLAY at 500mm		6	
700			<u>'''</u>				
700							
800							
900							
1000							
1100							
1200							
1300							
1400			-		EOB		
1500			-				
1600			-				
1/00							
1800							
1900							
2000			-				
2100			-				
Graphic Log Legend					The subsurface data described above has been determined at this specific borehole location and will not identify any variations away from this location. The data is for the determination of soil type for wastewater disposal applications only and is not to be		

	O'BRIEN DESIGN CONSU		32	NUMBER OF THE OWNER			
Client			Alice Mass	sey & Lee Caton	Job No.	2812	
Project	Project Installation of onsite wastewater		Date Drilled	6/09/2022			
Site Add	dress		137 Wiroa Road, Kerikeri Drilled By		Drilled By	M O'Brien	
Legal D	escriptio	on	Lot 1 DP 1	74247	50mm hand auger		
Depth mm	GWL	Soil Map Reference	Graphic Log	Field D	escription	Soil Category	
100 200 300	intercepted	elly friable DK)		Slightly moi	st brown topsoil	5	
400 500 600	Broundwater	(aihau grav clay (Moist brownish	orange, silty CLAY	5	
700	0	ð		Saturated orange	silty CLAY at 600mm	6	
800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 2000 2100					EOB		
Graphic Log Legend					The subsurface data described above has been determined at this specific borehole location and will not identify any variations away from this location. The data is for the determination of soil type for wastewater disposal applications only and is not to be used for geotechnical purposes.		
	O'BRIEN DESIGN CONSU			WWW.dbh.gov.n			
--	----------------------------	--------------	----------------	----------------------	--	-----------------	--
Client			Alice Mass	sey & Lee Caton	Job No.	2812	
Project			Installation	of onsite wastewater	Date Drilled	6/09/2022	
Site Add	dress		137 Wiroa	Road, Kerikeri	Drilled By	M O'Brien	
Legal D	escriptio	on	Lot 1 DP 1	74247	Drill Method	50mm hand auger	
Depth mm GWL Soil Map Reference			Graphic Log	Field D	Soil Category		
100 200 300	spted	clay (OK)		Slightly moi	st brown topsoil	5	
400 500 600	lwater interce	elly friable		Moist brownish	5		
700 800 900	Ground	kaihau grav		Moist oran	6		
1000		0		Saturated or	6		
1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100					EOB		
Graphic Log Legend					The subsurface data described above has been determined at this specific borehole location and will not identify any variations away from this location. The data is for the determination of soil type for wastewater disposal applications only and is not to be used for geotechnical purposes.		

10.0 On Site Wastewater Installation Guide for the Installer



LINE FLUSHING VALVES:

Line Flushing Valves are used to provide a cleansing action in the dripperline each time the zone is turned on.

- When a zone is turned on, the flush valve begins dumping water into a sump (valve box).
- The dumping of water (additional flow) allows the velocity of water inside the dripperline to increase momentarily helping to clean the inside walls of the tubing and drip inlet filters.
- This action moves sediment out of the zone and into the sump.



AUTOMATIC LINE FLUSHING VALVE:

- Place one Automatic Line Flushing Valve at the furthest point in the drip system.
- For GRID layouts this will typically be in the collecting manifold. On flat sites the Automatic Line Flushing Valve can be installed in the middle of the collecting manifold however in sloping sites the flushing manifolds should be installed at the lowest end.
- For LITE layouts the Automatic Line Flushing Valve will be installed at the midpoint of the tubing layout.
- Use one Automatic Line Flushing Valve for each 45L/M of zone flow.
- All Automatic Line Flushing Valves should be installed in a valve box with a gravel sump adequate to drain approximately 4 litres of water.
- Automatic Line Flushing Valve requires a minimum pressure of 70kPa (7m) to shut off completely.

MANUAL FLUSHING VALVE:

- Allows for manual flushing of lines during system start-up and during season.
- Manual Flushing Valves should be located at each end of the collecting manifold in a GRID system.
- Manual Flushing Valve should be located at the midpoint of a LITE layout.
- Allow 1 second per metre of dripperline & poly pipe in the zone for as a general guide for an adequate flush time.



<u>TECHLINE AS™ DESIGN GUIDE</u>

AIR/VACUUM RELIEF VALVES:

Air/Vacuum relief valve freely allows air into a zone after shut down. It also ensures a vacuum within non Anti Siphon dripperline system doesn't suck debris or dirt back in to the dripperline. It also provides a means of releasing air from the dripperline when the zone is turned on, eliminating air pockets and speeding up the dripperline operation.



- Install Air/Vacuum Relief Valve at the highest point in the drip system.
- Install one Air/Vacuum Relief Valve for every 40L/M of zone flow.
- Ensure that all of the rows of Dripperline can take advantage of the Air/Vacuum Relief Valve; install it/them along a lateral that runs perpendicular to the dripperline laterals. This may be a collecting manifold, or a special lateral connecting all rows of dripperline, such as going over a mound.



All Air/Vacuum Relief Valves should be installed in a valve box with a gravel sump. This
will ensure that the only clean air will enter the drip system.



Note: Larger Air Release valves are available for large projects.

TECHLINE AS™ DESIGN GUIDE

SLOPES AND MOUNDS:

Techline AS[™] has a self regulating dripper with an anti-siphon device built into it which will ensure that it will perform reliably on sites with slopes or mounds. When the drip systems shuts down however remaining water inside Techline AS[™] will drain out which can cause an accumulation of water at the lower reaches of the drip system. This can be further compounded by the natural movement of water down the slope.

When designing a Techline AS[™] system for sloping ground or mounds ensure that:

- Techline AS™ is installed perpendicular to (across) slopes. This helps eliminate water drainage at the lower ends of the drip laterals.
- On large slopes split the slope into two zones; run the top 2/3 on one zone and run the bottom 1/3 on a separate zone. This will allow greater irrigation control and will allow two areas with different water requirements to operate more efficiently.



 Install Dripperline Non Leakage (DNL) device which will hold back water inside the dripperline laterals and manifolds.



NOTE: Netafim UniRam CNL™ is a commercial dripperline that has a "non-leakage device" built into its drippers and prevents water draining out of them when the system is shut-off. It will hold back 1.4m of water within the drip system. This dripperline should be considered for projects where water drainage is undesirable.

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11.0 On Site Wastewater Maintenance for the Owner

11.1 Why regular maintenance

Septic tanks and on-site wastewater treatment systems need regular maintenance to work properly. The impact on the environment is minimal if your system is well-maintained.

Owners are legally responsible for maintaining their on-site wastewater treatment system.

There are health risks for you, your family and your community from poorly maintained wastewater treatment systems. Poor maintenance of treatment systems can cause sewage effluent to rise to the surface or effluent to enter the groundwater system. People and animals can fall sick by coming into contact with raw sewage or by drinking contaminated groundwater. The life of your system depends on how much effluent is discharged each day and other factors such as rainfall and general clogging of pores in the ground. The greatest impact is how you maintain your system and what you put down it.

Components of your system

Your onsite wastewater system comprises of two main parts:

- <u>Wastewater treatment unit</u> generally a septic tank or aerated treatment system.
- <u>A land application system</u> generally trenches, or low-pressure surface or subsurface irrigation drip lines.

Both parts of the system need to be maintained to ensure that no health effects occur.

Do:

- Use biodegradable, low phosphate household cleaners and laundry powders or liquid.
- Use body washes and shower gels, instead of soap, (or non-petroleum based products).
- Use the water and suds saver cycles on your dishwasher and washing machine (if fitted) and put a water saver device on your shower.
- Fix any leaking pipes and toilet systems.
- Clean septic tank outlets and filter when required (usually every 6 months).
- Follow the service and maintenance requirements of your system.
- Scrape all dishes to remove food material before washing.
- Keep all possible solids out of the system.
- Inspect tank annually for sludge and scum levels.
- The tank should be pumped out approximately every 3–5 years. Have tank pumped out when:
 - the top of the floating scum is 75mm or less from the bottom of the outlet
 - sludge has built up to within 250mm of the bottom of the outlet

Don't:

- Use soap-based washing powders that do not biodegrade.
- Install a waste master disposal in your sink.
- Dispose of eggshells, coffee grounds or tea bags. Compost food scraps or put in rubbish.
- Dispose of strong bleaches, chlorine compounds, antiseptics or disinfectants, medicines or disposable nappies, sanitary napkins/pads or condoms into drains.
- Allow fat to be poured down the sink.
- Put petrol, oil, flammable/explosive substances, trade waste or chemicals down the drain.
- Empty a spa or swimming pool into the system.

Signs of trouble

The system is not working correctly if:

- There is a foul smell around tank or land application area.
- The tank, gully trap or tank mushroom is overflowing.
- The ground around the tank is soggy.
- Sinks/basins/toilets are emptying slowly or making gurgling noises when emptying.
- The grass is unusually dark green over the land application area.

11.2 Northland Regional Council Public Information

Aerated Wastewater Treatment Systems

The term 'Aerated Wastewater Treatment Systems (AWTS)' covers a range of types of onsite treatment systems that provide additional treatment to septic tank effluent. Their mechanical pumps require regular maintenance and a continuous power supply.

In general, an AWTS has three parts which may be housed in a single unit or split into more than one unit (see diagram below). This is a generalised diagram of an AWTS. Designs may differ with different brands.



The three main processes that take place in an AWTS are:

Settlement and anaerobic treatment

This takes place in a chamber or tank, and the process is identical to what happens in a septic tank. Solids within the effluent settle and are broken down by anaerobic bacteria (bacteria that live without oxygen).

Aerated treatment

The effluent then enters a second chamber where aerobic bacteria (bacteria that require oxygen to live) break down the solids further and reduce the number of harmful bugs within the effluent. This normally happens by either passing the effluent over, or through, a material that contains aerobic bacteria or by pumping air directly into the effluent. In some AWTS, a combination of both methods may be used.

Final settlement (clarification)

After the aeration treatment, the effluent is allowed to settle before being pumped to a disposal system. An AWTS removes a greater amount of solids from the effluent than a septic tank does and therefore problems within the disposal system caused by clogging are less likely. The additional treatment within the aerobic chamber should result in effluent that has fewer harmful bugs and nutrients, so it is less likely to be harmful to the environment. The installation of an AWTS is particularly useful in areas where there is a high groundwater table that needs protection or where there are poorly draining soils.

Effluent disposal

Effluent from an AWTS is commonly disposed of through dripper irrigation lines, which are flexible pipes with small pressurecompensating drippers installed along their length. The drippers should be self-flushing, which helps prevent them becoming clogged, and there should also be "flushing valves" at the end of each line for maintenance purposes.

Dripper lines are to be surface laid on level ground and planted with water loving plants. Lines are to be mulched with a minimum of 100mm of mulch.

It is recommended that the wastewater disposal area be clearly marked or fenced to minimise the risk to human health and reduce the possibility of damage to the system. The disposal field should not be used to graze animals, be driven on or built over. These activities can result in damage to and failure of the disposal field.

Surface water cut-off drains

If your disposal system is located on a slope, a surface water cut-off drain will usually be installed above the effluent disposal system to prevent stormwater runoff from the slope entering the disposal area. All surface water cut-off drains need to be maintained to make sure they work properly. This may include removing excess grass or plant growth from the drains and making sure there are no other obstructions to prevent the free flow of water.

Prior to winter, it is a good idea to give all surface water cut-off drains a quick visual check and to carry out any required maintenance as soon as possible. If a surface water cut-off drain is not working properly, the excess stormwater entering the disposal area will cause failure of the disposal system and result in effluent flowing down the slope.

11.3 Recommended Plants

Water loving native plants are recommended for the wastewater disposal field.

Native shrubs, trees and ground covers

Kiokio (fern) Blechnum novaezelandiae

Putaputaweta Carpodetus serratus

Sand coprosma (ground cover) Coprosma acerosa

Mingimingi *C. propinqua*

Taupata C.repens

Cabbage tree (fast) Cordyline australis

Karaka (large tree) Corynocarpus laevigatus

Tree fuchsia Fuchsia excorticata

Koromiko, hebe *Hebe stricta*

Houhere, lacebark (fast) Hoheria populnea

Pukatea (large tree) Laurelia novae-zelandiae

Manuka Leptospermum scoparium

Kawakawa Macropiper excelsum

Grass-like plants

Oioi, jointed rush Apodasmia similis

Rengarenga, rock lily Arthropodium cirratum

Rautahi, tussock sedge Carex geminata

Purei, pukio, tussock sedge Carex secta

Toetoe * *Cotaderia fulvida*

Umbrella sedge Cyperus ustulatus

Turutu, NZ blueberry Dianella nigra

Pepepe, toetoe tuhara Machaerina sinclarii

Harakeke, flax (fast) Phormium tenax

* Do not use invasive exotic pampas grasses



12.0 Limitations

- 1. It is imperative that this report be read in full before installation commences. O'Brien Design Consulting Ltd. is to be contacted if there are any variations in subsoil or site conditions from those described in this report. Site conditions may change from the date of the site visit.
- 2. O'Brien Design Consulting Ltd. is to be contacted if for any reason installation of the onsite wastewater system cannot be achieved to the design set out in this document. In this event O'Brien Design Consulting Ltd. reserves the right to revise this document. Should at any time the design be altered, O'Brien Design Consulting Ltd. are to be contacted for written approval before installation commences.
- 3. Our responsibility for this report is limited to the property owner named in Part A of this document. We disclaim all responsibility and will accept no liability to any other person unless that party has obtained the written consent of O'Brien Design Consulting Ltd. O'Brien. Design Consulting Ltd reserves the right to qualify or amend any opinion expressed in this report in dealing with any other party. It is not to be relied upon for any other purpose without reference to O'Brien Design Consulting Ltd.
- 4. Any alteration to the site plan or design will result in noncompliance.
- 5. The wastewater disposal field is designed according to the number of bedrooms, potential occupancy and wastewater volumes produced, as outlined in this report. Any increase in the number of bedrooms, potential occupancy or wastewater volumes produced may result in failure of the field. O'Brien Design consulting take no liability for wastewater volumes produced exceeding that stated in Part E, number 2.
- 6. Recommendations and opinions in this report are based on data obtained from the investigations and site observations. The nature and continuity of subsoil conditions and groundwater at locations other than the investigation bores and test areas are inferred and it should be appreciated that actual conditions could vary over the site.
- 7. This report does not investigate or give recommendations on ground bearing capacity for foundations or slope stability. A geotechnical report may be required. This is the responsibility of the homeowner.
- 8. Following payment to the FNDC your Building Consent documentation will be emailed to you. It is the responsibility of the homeowner/builder to engage a registered drainlayer to install the system and field. The homeowner/builder is responsible for ensuring a printed copy of the issued Building Consent documentation is onsite at every inspection. Plans must be printed in colour and be at least A3 size. The installation is to be inspected by a FNDC inspector or similar suitably qualified person.
- 9. Following completion of the project it is the homeowner's responsibility to apply for Code of Compliance. The system manufacturer and drainlayer should assist you in applying for Code of Compliance. You will need to fill out a Code of Compliance Form as provided in the following link: <u>https://www.fndc.govt.nz/Our-Services/Building-Consents/Building-forms-and-guides/Code-Compliance-Certificate-Form-6</u>. You will also need an As Build diagram from the drainlayer showing installation and a commissioning statement and electrical certificate from the manufacturer.
- 10. The homeowner is responsible for the everyday upkeep of the system and field. Information is provided in the NRC Public Information section of this report. Further information is to be supplied by the manufacturer.
- 11. It is the responsibility of the owner to provide the Far North District Council with a maintenance agreement for the installed system. The maintenance of onsite wastewater systems should be sustained to reduce the risk of system failure.
- 12. Any questions arising from the above or during installation, please call O'Brien Design Consulting Ltd.

13.0 Producer Statement



DESIGN: ON-SITE EFFLUENT DISPOSAL SYSTEMS (TP58)

ISSUED BY: Martin O'Brien......(approved qualified design professional)

TO: Alice Massey & Lee Caton.....(owners)

TO BE SUPPLIED TO: Far North District Council

PROPERTY LOCATION: 137 Wiroa Road, Kerikeri, Lot 1 DP 174247

TO PROVIDE: Design an on-site effluent disposal system in accordance with Technical Paper 58 and provide a schedule to the owner for the systems maintenance.

THE DESIGN: Has been in accordance with G13 (Foul Water) G14 (Industrial Liquid Waste) B2 (durability 15 years) of the Building Regulations 1992.

As an independent approved design professional covered by a current policy of Professional Indemnity Insurance (Design) to a minimum value of \$200,000.00, I BELIEVE ON REASONABLE GROUNDS that subject to:

(1) The site verification of the soil types.

(2) All proprietary products met the performance requirements.

Construction monitoring required:

The proposed design will meet the relevant provisions of the Building Code and 8.15 of The Far North District Council Engineering Standards.

MOIS

Licence Building Practitioner - Design 2, MA, BA with Hons (Professional qualifications) BP103567......(Licence Number or professional Registration number)

Address: 153B Kerikeri Inlet Road, Kerikeri Phone Number: 09 407 5208, 027 407 5208 Date: 19th December 2024

Note: This form is to accompany every application for a Building Consent incorporating a T.P.58. Approval as a design professional is at Councils discretion.

PRELIMINARY SITE INVESTIGATION (PSI)



CHANGE OF USE & SOIL DISTURBANCE LOT 1 DP 174247, KERIKERI



PO BOX 229, Kerikeri 0211518315



DATE: 18 APRIL 2023 SOIL SAMPLING AND REPORT WRITING: REBECCA LODGE SQEP

Limitations

Bay Ecological Consultancy Ltd performed the services in a manner consistent with the normal level of care and expertise, however the conclusions made are unable to account for unknown buried contaminants or unknown historic structures or activity that may have resulted in isolated soil contamination. The PSI methodology was subject to financial constraints, (meaning a reasonable but not exorbitant level of professional fees incurred), but is considered to derive a reputable insight into past land use and contamination to form the corresponding conclusion.

Bay Ecological Consultancy Ltd accepts no responsibility for errors or omissions in any data obtained from certified labs, regulatory agencies, verbal or written statements from outside parties, or negligent land use resulting in situations contrary to the findings and scope of this assessment (for example burning of CCA treated timber).

Should further information become available regarding the conditions at the site, Bay Ecological Consultancy Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable.

Due to the variable nature of soils between sample locations, limitations of chemical analysis, and again financial constraint within reason, there is no investigation that is thorough enough to completely describe a site's characteristics or preclude the presence of materials at the site that presently or in the future may be considered hazardous.

The recommendations are intended to determine a general suitability for the subject activity and therefore may not be used as a recommendation for extended use or alternative activities on that site.

Where any conclusion requires remedial work, the parties carrying out remediation shall be responsible for all such works, including health and safety precautions as appropriate. Bay Ecological Consultancy Limited disclaims all liability whatsoever for any loss or damages, if any, suffered by any party as a result of any remediation works undertaken.

This document is provided for sole use of the client and is confidential to it. No responsibility is accepted for any use a third party makes of this document or damages suffered as a result of decisions or actions based on this document.

Confidentiality

This report is prepared for change of use and associated soil disturbance activity. Under no circumstances should this report or information contained therein be distributed, reprinted or reproduced in any form without the author's approval.

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EXECUTIVE SUMMARY

This Preliminary Site Investigation has been prepared in respect to Resource Management Regulations National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS 2011), for purpose of *change of use* and *soil disturbance* of the subject site (approx. 5433m²) described as Lot 1 DP 174247 (NA105D/135), Wiroa Rd, Kerikeri. It has been requested by the owners James & Jane Massey in response to a Sec37 request from Council (10/ 10/22), to account for *CHANGE OF USE* activity under the NES-CS, the reason given as:

Whole site is orchard cover. Change of Use required from production to residential use

Its requirement is triggered by the likelihood of HAIL activity having occurred on the subject Lot. Due to production activity, the primary HAIL activity was considered

• A10 Persistent pesticide bulk storage or use (HAIL List 2011)

The objective of reporting is to determine whether there is any risk to human health from soil contaminants as a result of *change of use* to a more sensitive residential occupation of the subject Lot, in comparison with the SCSs_(health) Residential 10% Produce scenario, appropriate to size and intended use. Proposal plans have been provided by Advance Build (Rev C01 Nov 22). The site has been in citrus prior to and since its subdivision from the larger parent parcel in 1996. This preceded the NES- CS (2011) and in this regard there is no prior reporting.

Reporting combined the qualitative and quantitative data obtained from both a qualitative desktop review and quantitative soil sampling to draw a conclusion as to the likelihood of a risk to human health resulting from the proposed activity.

No exceedance of the appropriate SCS_(health) Residential 10% standard was found.

Therefore, it is considered highly unlikely there will be a risk to human health if the proposed activity of change of use takes place and this may proceed as a permitted activity in this regard.

Designated soil disturbance is within the permitted level of soil disturbance is 271.65m³.

INTRODUCTION

This report has been prepared to accompany a building application for the Massey property Lot 1 DP 174247 (NA105D/135) at the request of owners. The proposal has been subject to a Section 37 (10/10/2023) for further information from Council in regard to the NES- CS (2011).

Reporting incorporates the requirements for a Preliminary Site Investigation Report as per Contaminated Land Management Guidelines 1: Reporting on Contaminated Sites in New Zealand (MfE 2021 revised). The objective of this report is a broad investigation to determine whether there is any risk to human health from soil contaminants in regard to *change of use* of the subject Lot from production to residential occupation. Comparison of analysis results is made to the SCSs_(health) Residential 10% Produce scenario as the appropriate standard.

Information currently available about the property in question has been reviewed to support the development of the Conceptual Site Model (CSM) including the likelihood of contamination, likely exposure pathways and receptors.

Sources included

- Review of available historic information and photographs
- Preliminary site walkover and inspection
- Review of regional and local authority information
- National soil databases and reports

A sampling and laboratory analysis regime was then designed and incorporated into the study *screening to substantiate the desktop review or infer the need for further investigation*. A site specific Health and Safety plan was designed prior to any physical works being undertaken.

The purpose of the sampling was to:

- Assess soil conditions and the potential presence of contaminants in shallow soils
- Assess the potential risks to human health associated with potential soil contamination

Upon receipt, the laboratory results were evaluated against the SCS_(health), and compared to published datasets and professional experience of local soil characteristics, allowing revision of the Conceptual Site Model (CSM) and the site to be characterized. A conclusion on the likelihood of a risk to human health was made.

The NES-CS (2011) is focused on the protection of human health and broader potential effects of contaminants on ecological receptors is not considered at this reporting level.

REGULATORY REQUIREMENT

The requirement for this PSI is prompted by *change of use* for Lot 1 DP 174247 (NA105D/135) 137 Wiroa Rd, Kerikeri as per the *Resource Management* (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011:

5 APPLICATION

(1) (a) when a person wants to do an **activity** described in any of the subclauses (2) to (6) on **a piece of land** described in subclauses (7) or (8)

The proposed building of a house will engender subsequent *change of use* of Lot 1 from production, in theory, to residential, an activity under Subclause (6) of Regulation 5:

(6) An activity is changing the use of a **piece of land**, which means changing it to a use that, because the land is described in subclause (7), is reasonably likely to harm human health.

As part of a production parcel orchard use **the piece of land** is considered the accessible exposure area to which sub clause (7)(c) is applicable:

Subclause (7)(c)

It is more likely than not that an activity or industry described in the HAIL is or has been undertaken on it.

The primary HAIL activity considered was:

• A10 Persistent pesticide bulk storage or use (HAIL List 2011)

Also applicable is:

Subclause (8) If a piece of land described in subclause (7) is production land, these regulations apply if the person wants to—

• (d) change the use of the piece of land in a way that causes the piece of land to stop being production land.

Change of use and associated soil disturbance are permitted activities only if they uphold Regulation 8:

8 PERMITTED ACTIVITIES

(4) Subdividing land or changing the use of land is a permitted activity while the following requirements are met:

- (a) A preliminary site investigation of the land or piece of land must exist
- (b) The report on the preliminary site investigation must state that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land
- (c) The report must be accompanied by a relevant site plan to which the report is referenced
- (d) The consent authority must have the report and plan

Additionally, in regard to 8 PERMITTED ACTIVITIES

(3) Disturbing the soil of the piece of land is a permitted activity while the following requirements are *met*:

(a) controls to minimise the exposure of humans to mobilised contaminants must-

(i) be in place when the activity begins:

(ii) be effective while the activity is done:

(iii) be effective until the soil is reinstated to an erosion-resistant state:

(b) the soil must be reinstated to an erosion-resistant state within 1 month after the serving of the purpose for which the activity was done:

(c) the volume of the disturbance of the soil of the piece of land must be no more than $25m^3$ per $500m^2$: (d) soil must not be taken away in the course of the activity, except that,—

(i) for the purpose of laboratory analysis, any amount of soil may be taken away as samples:

(ii) for all other purposes combined, a maximum of 5m³ per 500m² of soil may be taken away per year:

(e) soil taken away in the course of the activity must be disposed of at a facility authorised to receive soil of that kind:

(f) the duration of the activity must be no longer than 2 months:

(g) the integrity of a structure designed to contain contaminated soil or other contaminated materials must not be compromised.

The permitted soil disturbance (c) is calculated as: $5433m^2/500m^2 = 10.87$ $10.87 \times 25 = 271.65 m^3$ The permitted soil removal (d)(ii) is calculated as: $5433m^2/500m^2 = 10.87$ $10.87 \times 5 = 54.35 m^3$

Should soil disturbance or removal be in excess of permitted volume, resource consent is required. The proposed soil disturbance volume is given at 37.17m³ (*Refer CONCEPT PLAN CO1 ADVANCE BUILD*). As per NES CS Regulation 8(3)(e) any soil disposed offsite must be to a facility designed to accept soils of that type, with documentation of transport and disposal. For ease of process, given the size of the Lot, any soil excess to fill requirements is designated to be retained onsite for landscaping.

It should be noted, in relation to cleanfills, contaminated soils are defined as:

... all soils with contaminant concentrations greater than natural background levels at the cleanfill site (MfE 2002).

Cleanfill background levels are taken to be those provided by *Predicted Background Concentration* Mapping¹ and provided for local basalt soils in *Table 2* of this report. All natural soils or contaminated soils with concentrations of contaminants below background levels can be accepted at a cleanfill.

¹ Landcare Manaaki Whenua <u>https://lris.scinfo.org.nz/layer/48470-pbc-predicted-background-soil-concentrations-new-zealand/</u>

SITE DESCRIPTION

The subject property is located on the south side of Wiroa Rd, approx. 550m east of the Bay of Islands Airport towards SH10 & Kerikeri township. It is outlined below and illustrated on the concept plan below (*FIG 2 Advance Build*).

FIG 1: SITE LOCATION



TABLE 1: SITE DESCRIPTORS

DESCRIPTION	LOT 1 DP 174247
OWNER	JAMES & JANE MASSEY
ADDRESS	137 WIROA RD KERIKERI
RECORD OF TITLE	NA105D/135
AREA	TOTAL AREA 5433m ²
ZONING	RURAL PRODUCTION
COVER	CITRUS & SHELTERBELTS
	GRASSED MARGINS & CLEARED HOUSE SITE
TRIGGERING HAIL ACTIVITY	A10- PERSISTENT PESTICIDE BULK STORAGE OR USE (HAIL 2011).
RELEVANT SCS(health)	RESIDENTIAL 10% PRODUCE
PROPOSED ACTIVITY	CHANGE OF USE (HOUSE) & SOIL DISTURBANCE
SAMPLE LOCATIONS	REFER APPENDIX 2 : SITE SAMPLE LOCATIONS
SOIL TYPE	OK – OKAIHAU GRAVELLEY FRIABLE CLAY

FIG 2: PROPOSED BUILDING SCHEME (ADVANCE BUILDING NOV 2023)



SITE INSPECTION & CURRENT CONDITION

The overall site has a simple homogenous orchard character and is well kept. The site walkover and inspection revealed no visible signs of contamination by way of odour, ground staining, unexpected bare soil, ACM fragments on soil surface, or unusual plant stress.

Orchard has been present through change of ownership (refer *HISTORIC USE*). There have been no known or visible burns and there are no known burial areas of waste or products that may pose a risk to human health or the environment. Citrus have been cut to ground level in the proposed house area and chipped. Brown patches visible are natural coloration from short mown kikuyu.

SITE PHOTOGRAPHY







Current state is shown below, although area of trees for house in southwestern corner have been removed for house and central hedge has been cut down.



FIG 3: GOOGLE 2022

SURROUNDING LAND USE

Current land use in the immediate area is predominantly rural lifestyle properties, orcharding and light commercial/ industrial. The Bay of Islands Airport is 800m to the west along Wiroa Rd, while Hideaway Lodge backpackers, X Stream Metal Workshop and Marsden Estate Winery are also toward State Highway 10 It is bordered to the north by Wiroa Rd, kiwifruit orchard beyond shelterbelts on Lot 2 DP 174247 directly to the east and Lot 1 DP 141315 directly behind further down gravel shared access. Lot 2 DP198777 to the west is in pasture, formerly mixed production orchard and pasture.

The site is not listed on NRC SLUR Mapping². This does not mean that no HAIL activity has been undertaken onsite, rather that NRC have no recorded knowledge of any.



FIGURE 4: PROXIMATE NRC SELECTED LAND USE REGISTRY PROPERTIES

Communication with NRC Contaminated Land Management Team received the following information on the site (4/4/23)

Regarding your site query for Lot 1 DP 174247 (Wiroa Road, Kerikeri):

The property that you have enquired about is not listed on the NRC Selected Land-use Register (SLR) for any current or historical Hazardous Activities and Industries List (HAIL) activities. Please note that the SLR is not a comprehensive list of all sites that have a HAIL land use history. It is a live record and therefore continually being updated. It is noted that aerial images indicate the presence of horticulture.

There are no environmental incidents or resource consents recorded on the property.

² Selected Land Use Register

NRC has aerial images of the site for the following years that can be provided upon request – 2000, 2007, 2008 and 2014.

The airport to the west is bordered by a large polygon that captures entire property including the runway, buildings and margin. It is classified *F1- Airports*, which captures other individual HAIL activities e.g. fuel storage. All other properties classified in the wider area are mapped *A10: Persistent pesticide bulk storage* The majority of the subject Lot parent parcel and wider Kerikeri/ Wiroa Rd boundary area was at one time in orchard or horticulture and this is not unexpected.

None of these are considered to have any measurable influence on site soils.

ENVIRONMENTAL & GEOPHYSICAL SETTING

The site has a flat contour, at approx. 132 m.s.l. The site is bisected by an artificial drainage ditch to benefit the orchard trees. No saturation was noted despite heavy ongoing rain conditions prior to the site visit.

The open water is approx. 180m south. Several ponds are visible in aerial photography, likely connected hydrologically to the headwaters of the Waihaua Stream approx. 410m south of the subject site, tributary to the Waitangi. No seepage or wetland areas are present as per the recently updated *natural inland wetland* definition (NPS-FM 2020), including in the drainage ditch, with consideration also given 100m south downslope onto Lot 1 DP 141315.

Depth to groundwater is estimated below 7m from the closest registered bores on similar geology.³ Contaminants levels compliant with residential SCS_(health) scenarios are not considered to pose a threat to groundwater sources (NEPM 2013). No groundwater was reported encountered during sampling for this report.

The site soils are mapped as Okaihau Gravelley Friable Clay (*OK*), old volcanic basalt soils of the Kiripaki suite⁴, somewhat excessively to well drained.

As there have previously been no published background levels for Northland, results are often compared to the soil data for the Auckland Region of similar geological origin. Recently, background soil levels have been published for Northland for heavy metals as part of a wider national report⁵ and now available through interactive database via the LRIS Portal⁶ Results for the sites basalt soils are given below, although it should be noted these are based on an area of 5339 km² and a limited number of samples. Background concentration for other soil types in the immediate area may vary e.g. sandstone or mudstone parent material.

These background soil concentration predictions were developed from geostatistical analysis of trace element data from regional councils, national soils database and GNS Science, identifying associations with geological parameters adapted from the GNS Science QMAP geological map dataset. The premise is that underlying geology is generally regarded as a major contributor to the geochemical signals in soils and surficial material. They are intended to provide a "first pass" initial assessment of background levels. It is noted that the accompanying report to this dataset recommends further refinement of results to accommodate local soil types.

Although chromium values given are total chromium, they are taken to represent CrIII rather than CrVI, as the only valency state normally found in aerobic soils (MfE 2011 Methodology).

³ https://services2.arcgis.com/J8errK5dyxu7Xjf7/arcgis/rest/services/Bore_Logs_/FeatureServer

⁴ www. lris.scinfo.org.nz/layer/48066-nzlri-soil accessed 5/4/2023

⁵ Cavanagh, J. McNeill, S. Arienti, C. & Rattenbury, M. (2015) Background soil concentrations of selected trace elements and organic contaminants in New Zealand. Envirolink Tools Grant: C09X1402. Landcare Research

⁶ https://lris.scinfo.org.nz/layer/48470-pbc-predicted-background-soil-concentrations-new-zealand/ accessed 3/4/2023

TABLE 2: PREDICTED BACKGROUND SOIL CONCENTRATIONS HEAVY METALS BASALT PARENT ROCK

As_n	41
As_Medpred	2.12
As_U95pred	8.87
Cd_n	18
Cd_Medpred	0.101
Cd_U95pred	0.51
Cu_n	35
Cu_Medpred	25.27
Cu_U95pred	108.3
Cr_n	76
Cr_Medpred	26.56
Cr_U95pred	128.5
Pb_n	52
Pb_Medpred	15.5
Pb_U95pred	56.34
Ni_n	72
Ni_Medpred	13.74
Ni_U95pred	77.43
Zn_n	20
Zn Medpred	71.29

HISTORICAL SITE USE

Information in this section has been obtained from a variety of public information sources including published and online, complimented by historic aerial photography. There has been no previous NES- CS reporting for the Lot. The subject Lot was initially considered a HAIL site due to production history, first pastoral then orcharding, illustrated in the *Historical Aerial Photography Appendix 1*, corroborated by anecdotal information and a review of historic titles.

In reference to the historical title search the following are considered relevant:

TABLE 3: CHRONOLOGICAL SITE HISTORY

DATE	RECORD OF TITLE	OF TITLE AREA OWNERS		USE (Inferred from aerial/ map review)
23/71969	NA490/487	8.2379ha	R D Glass	In pasture
15/5/ 1991	17D/1057	6.8172ha	K Lupi	Orchard
5/8/1996	NA105D/315	5433m ²	James & Jane Massey	Lifestyle

The Lot was originally part of farmland within the Wiroa C2 Blk (105.56ha). At the time of its subdivision to smaller Lots in 1969 orcharding was already well established in Kerikeri, however land along Wiroa Rd (formerly Kerikeri – Okaihau Rd) was considered less suitable and the area was more exposed. Orchard was however suggested as a reason for subdivision in the application, for apples. The subject Lot was contained in parent parcel Lot 2 DP 61960 (CT 17D/1057).

The site remained in pasture/ scrub until kiwifruit and citrus plantings were undertaken by owner K Lupi in the early 1980s on the parent parcel, after moving on a house in 1977 (BP63927 & PA362 now rear Lot 1 DP 141315). Anecdotal evidence from the current owners gives the subject Lot 1 DP 174247 as in citrus. In 1991, after extensions in 1981 & 1984 (BP 1149124; BP 332924), the residence and gardens were subdivided forming Lot 1 DP 141315 to the rear of the subject site, which remains in the same configuration. The scheme plan from this activity shows the subject Lot in citrus, and kiwifruit to the east. The implement shed that serviced the orchard also on this Lot (BP8156937).

Further subdivision of the remnant production parcel Pt Lot 2 DP 61960 in 1996 resulted in the current subject site Lot 1 DP 174247 containing the citrus block and neighbouring Lot 2 DP 174247 with the kiwifruit the east adjacent Wiroa Rd as todays configuration.

The Masseys have been in ownership since 1996, currently residing in the residence to the rear on Lot 1 DP 141315. The trees have only be subject to fertilizer and copper fungicide during this time.

No high risk locations are indicated in the review. There have been no stock treatment areas apparent on the subject area. No burn piles were visible in the aerial photography or onsite during walkover. The original home and sheds were contained within now Lot 1 DP 141315, visible in aerial photography.

HISTORIC AGRICHEMICAL USAGE IN NZ

The subject Lot is considered a HAIL site due to the historic production use. Extensive use of persistent agrichemicals on production land in NZ occurred as routine over the last 100 years. By 1975, application of the majority of SCS_(health) priority contaminants had been discontinued in NZ. However, use of persistent

organochlorines were not completely deregistered until 1989⁷. Within this time frame there was production activity across the wider site as established above.

The persistent contaminants most frequently found at high levels in NZ soils that have been subject to production are considered to be copper, arsenic, lead and DDT residues.⁸ Government endorsed spray programmes incorporated these as common products through the early and midcentury⁹, prescribing treatment for growers and pastoral use as routine.

Arsenic pentoxide was a primary herbicide, widely used to combat the 4 early agricultural major weed species – gorse, blackberry, ragwort and native bracken. Lead arsenate was the most common poison for the control of chewing insects across all production sectors from the late 1800s until the advent of organochlorines in the 1950s, and finally withdrawn in the early 1970s. The most common compound form in NZ was PbHAsO₄, applied routinely in powder form and as a liquid. It is typically the cause of residual elevated arsenic in ex production soils.

Prolonged use, outdoor storage or incineration of CCA treated timber can also commonly contribute arsenic to soil in sufficient quantities to fail SCS_(health) scenarios, with accompanying elevations of chromium and copper.

Residual lead levels may also result from fertilisers and fuel additives, as well as lead paint from deteriorated early structures or repainting/ alteration of a residence.

Cadmium (Cd) is commonly elevated in NZ production soils in comparison to national natural background levels (0.16mg/kg⁻¹). Natural variation exists due to underlying geology and weathering. The prolonged or extensive use of phosphate fertilisers represents the major anthropogenic source of elevated cadmium on production land throughout NZ¹⁰ especially for the period of use 1952–1996, during which the site was in active production. During this era the phosphate rock (PR) used in the manufacture of superphosphate in New Zealand was naturally enriched with Cd up to 550 mg Cd/kg⁻¹ P¹¹. In addition to Cd, phosphate fertiliser may also contain Pb, As, Cr and Cu as trace element impurities.

Organochlorines e.g DDT; Lindane, were widely used to control chewing and sucking insects such as thrips and leafroller, pests of orchards. This was not confined to vegetable or fruit production. DDT and other organochlorines were often mixed with fertiliser and lime for broad use on pastoral insects e.g. grassgrub and actively used throughout New Zealand for stock treatment between1945 – 1961. They then underwent restrictions with last registered use of DDT extending into the 1980s. The 1980s carries possible risk of additional lag use of DDT on pasture/ fruit trees despite being withdrawn, dependent on individual management practice.

Dieldrin, listed in the $SCS_{(health)}$ and known even in the 1950s to be the most toxic of the available chlorinated compounds¹², was used in NZ to control stock, pastoral and horticultural pests until the 1960s.

⁷ James, T. & Gaw, S. (2015a) Review of potential soil contamination issues from pesticide use in productive land and sports fields. Envirolink Report 1472 TSDC 103 for Tasman District Council

⁸ Gaw, S. K (2006) Trace element and DDT concentrations in horticultural soils from the Tasman, Waikato and Auckland regions of New Zealand. Science of the Total Environment 355: 31–47.

⁹ Aitkinson, J.D et al (1956) Plant protection in New Zealand. R. E. Owen, Government Printer, Wellington. 699 pp.

¹⁰ McDowell, R. (2012) The rate of accumulation of cadmium and uranium in a long-term grazed pasture: Implications for soil quality. New Zealand Journal of Agricultural Research 55(2):133-146

¹¹ MAF (2008) Report One: Cadmium in New Zealand Agriculture. Report of the Cadmium Working Group August 2008

¹² Aitkinson, J.D et al (1956) Plant protection in New Zealand. R. E. Owen, Government Printer, Wellington. 699 pp.

Copper based fungicides were widely used in historic horticultural spray programmes, particularly in the form of Bordeaux mixture. Prolonged use, continuing in the industry to the present, has resulted in residual levels of up to 523 mg/kg⁻¹ in NZ production soils and orchards typically have the highest levels compared to other horticultural uses¹³.

In summary, as part of a former production land the potential inputs from both early farming and then orchard/ horticulture were considered primarily organochlorines and the inorganic metals. It is assumed potential contaminants would have been distributed homogenously across orchard and the pasture prior from general use. No known stock treatment areas were visible and sheds were offsite.

Typical modern agrichemicals associated with orcharding including synthetic pyrethroids and organophosphates are not considered **persistent** under normal broad acreage conditions as defined by international criteria¹⁴. Additionally, given the length of time since the orchard may have been commercially treated they are not considered any potential risk in this investigation. Copper and cadmium are the most likely to show any elevation.

¹³ Gaw, S. K (2006) Trace element and DDT concentrations in horticultural soils from the Tasman, Waikato and Auckland regions of New Zealand. Science of the Total Environment 355: 31–47.

¹⁴ United Nations Environmental Programme (UNEP) & European Union Definition - half life greater >6 months in soil (Reg. EC No 1107/2009)

SAMPLING & ANALYSIS PLAN (SAP)

CONCEPTUAL SITE MODEL

Development of the conceptual site model (CSM) incorporated a review of site specific information; proximate NES -CS reporting and generalities of historic production use land in New Zealand to profile the site's *potential* contaminants, receptors and the exposure pathways between.

- Without sampling and subsequent analysis there is no sure way of determining whether a given site is contaminated or not (ANZECC 1992).
- Investigation need only be undertaking for contaminants of concern, particular to a site (MfE 2012).
- In the absence of a complete exposure pathway of a contaminant above a specified concentration to a receptor there is no risk to human health.

POTENTIAL CONTAMINANTS

Potential contaminants were considered to be those that may be residual in the broad acreage as persistent contaminants including those listed in the $SCS_{(health)}$, routinely used as components of pasture and orchard protection. These are the heavy metals and organochlorines.

Samples were also not analysed for boron, mercury, PAHs (BaP), Pentachlorophenol (PCP) or the dioxins included in the SCS_(health) as there were no indicators of significance commonly associated with their inputs.

EXPOSURE PATHWAYS

Soil ingestion and additionally produce consumption are the major SCSs_(health) contaminant exposure pathways in residential scenarios. Soil ingestion can occur through inadvertent hand to mouth transfer, ingestion of soil attached to produce and mouthing of objects by children.

Groundwater is not considered to be a contaminant pathway as it is expected at depth >7m and there are no groundwater takes.

RECEPTORS

Potential receptors were considered primarily to be future residential occupants. The *qualitative* CSM illustrating *potential* contaminant – receptor pathways is considered as below:

FIG 5: PRELIMINARY QUALITATIVE CSM



In summary, it was considered that the subject Lot had *more likely than not* been associated with a production history potentially involving contaminants listed in the SCS_{(health).} It was considered a low but potential risk, warranting soil sampling over the broad acreage to substantiate the qualitative conclusion, quantifying and refining the potential risk to human health. This low risk assessment was bolstered by

extensive professional knowledge of the Kerikeri historic orcharding area, Sheds located offsite and no stock treatment areas apparent from historic photography.

It was considered a cost effective analysis to use the selective organochlorine and heavy metal suites to capture the common $SCS_{(health)}$ components of historic sprays, amendments and common ash contaminants.

DESIGN

The CSM was considered in the design of the sample plan. Eighteen samples were obtained from the site on the 4th April 2023 in accordance with NES Users Guide (2012) and CLMG 5. (2021).

As a Preliminary Site Investigation, the data quality objective of soil sampling was to *substantiate the findings of the desktop study or infer the need for further investigation*. Without sampling and subsequent analysis there is no sure way of determining whether a given site is contaminated or not (ANZECC 1992).

Composite sampling was deemed acceptable as the data was not required to be subject to statistical analysis and any contamination expected to be low.

Composites are prepared by the contracted laboratory (Hills Laboratories) from individual samples they received and were maximum 4 samples.

As per the revised site investigation Guidelines (CLMG 5 MfE 2021) it is no longer considered necessary to adjust the SCS (heath) Guideline value by the number of contributing samples in composite.

Analysis was requested for the heavy metal and organochlorine suite, as a cost effective selection of key metals associated with historic production.

Broad site organochlorine composites were designated from the samples at a lesser density to the metals to constrain costs in this preliminary stage, expected to be of lower risk respective of typical residue levels. If residues were detected above expected parameters from NZ reporting¹⁵ (Auckland orchards median 2.23 mg/kg⁻¹) and professional experience, then more intensive testing would be appropriate.

Although not NES priority contaminants, zinc and nickel are included in the Hills Laboratories heavy metals analysis suite, and may provide insights into a site history's influence of soils. They may be elevated above background levels in residential and ex production land, although rarely above levels protective of human health. Zinc is an ingredient in stock treatment and common use fungicides to the present day. Nickel compounds were also used as fungicides from the 1960s. Nickel may also be contained as a trace element in fertilisers and is a contaminant in copper compounds. Where no New Zealand SCS_(health) exists for a substance, a framework for adopting an international standard is given in CLMG 2. (MfE 2011). In this instance the relevant Australian NEPM (revised 2018) Health Investigation Levels (HILS) for Soil (Schedule B1, Table 1A(1), Residential A scenario) are referenced as best practice.

Surface samples (0-150mm) are generally used to quantify the contaminants listed in the SCSs_(health), with 0-75mm commonly used to represent the direct human exposure pathway. Depths 0-150mm additionally cover the home produce exposure pathway, covering the significant root zone (CLMG.5. 2021). Therefore, samples were taken towards 150mm to incorporate both.

Due to the clay soils, leaching of potential contaminants is not expected to be significant below this depth and results are considered to indicate and/or represent the likely contaminant load at further depth for future earthworks. An individual sample within the house cut area was taken to confirm this assumption.

MfE CLMG. 5 (2021) sampling methodology recommends one replicate per ten samples, intended to guide

¹⁵ Gaw, S. K (2006) Trace element and DDT concentrations in horticultural soils from the Tasman, Waikato and Auckland regions of New Zealand. Science of the Total Environment 355: 31–47.

more rigorous DSI requirements. Replicate samples should be *individual samples taken from a single sample location* (MfE CLMG 5. 2021). The majority of samples taken were designated as composites, with samples combined in the laboratory, and therefore subject to an inherently higher risk of exaggerated variation, not necessarily pertaining to precision of field sampling technique. An individual metals sample was therefore designated to be replicated (F1) and considered sufficient due to experience and short sampling window.

A rinsate sample was also taken within the course of sampling to assess the efficiency of equipment decontamination procedures. This sample was analysed for arsenic only, as a primary CoC and to restrain sampling costs. Competence of decontamination for one analyte should confer effective decontamination for other analytes.

Systematic sampling focused on obtaining broad even coverage of the site at an approx. 15m spaced grid. This is considered an acceptable cost effective distribution to give further reassurance and in light of the low risk from the broad acreage historic production use of the site, in the absence of burns. Sample allocation is illustrated in the *Appendix 2 and* summarised below:

COMPOSITE	CHARACTER	ANALYTES
A1-4 B1-4	All Composites systematic sampling broad Lot Accessible natural soils	HEAVY METALS
C1-4 H1- H4	House Site	
A1; A4; H1; H4 B2; B3; C2; C3	Broad coverage Lot	ORGANOCHLORINES
INDIVIDUAL SAMPLES		
X1 & Replicate S1	House site	HEAVY METALS

TABLE 4: SAMPLE ANALYSIS PLAN

FIELD METHODOLOGY

Soil collection was by grab sampling with a stainless steel trowel from a spade excavated hole, allowing visual inspection of the soil profile and characteristics.

Sample locations were measured from static points and any defining characteristics noted. Sampling tools were washed with distilled water between each soil extraction.

FIELD QA/QC

Individual samples were isolated in appropriate jars to prevent deterioration and labelled in accordance with Hills Laboratories submission requirements, including date, time and an individual sample name e.g. C1. Compositing of metals/organochlorine samples was undertaken by Hills staff under lab protocols and conditions. QA/QC audit was regularly made throughout the course of sampling with the sample plan, including cross check of sample names, required analysis and locations.

As described above in *Sampling & Analysis: Design*, sample technique QC included:

- Replication for heavy metals as CoCs X1 / replicate S1
- Equipment Rinsate Sample W1 arsenic

The replicate was blind, that is that the laboratory was not aware they were from the same sample location as the primary. Relative percentage difference of 30-50% was considered to indicate sample technique precision dependent on the analyte.

A specific site Health & Safety Plan was prepared prior to undertaking field work documenting established and potential hazards, and outlining method to eliminate, manage or reduce associated risk. Key aspects were:

- Disposable 1500SMS overalls, nitrile gloves. PS2 mask.
- Protective footwear and sampling equipment was rinsed on site and gloves changed at each sampling point
- PPE bagged for appropriate disposal before leaving the site.
- Owner informed prior to entering the site

LABORATORY QA/QC

Hills Laboratories are IANZ accredited. The attached analysis report contains samples received, analytical methods used, dates received and reported. Results were within expected parameters for ex production land in the wider Kerikeri and Waipapa areas on *OK* soils.

DATA QA/QC

As sampling was intended as a broad initial screening, no statistical analysis has been performed and composite sampling has been incorporated (\leq 4 samples per composite as per CLMG 5 MfE 2021). Outsourcing analysis to a professional accredited laboratory, and systematic review of returned data reports, in conjunction with thorough field QA/QC, provides assurance that the returned results are accurate.

Results were compared throughout the project with national surveys, available background levels, and expectation, based on professional experience in the immediate area.

BASIS FOR GUIDELINE VALUES

The human health guideline adopted is the NES SCS_(health) Residential 10% Produce standard as appropriate to the proposed subdivision, based on Lot size and shown below. It is a protective generic exposure scenario assuming potentially 10% of produce consumed could be grown onsite.

TABLE 5: GUIDELINE VALUE TABLES B2 - SCS_(health) APPENDIX B MFE USERS GUIDE (2012)

			Cadmium	Chromium			Inorganic	Inorganic
	Arsenic	Boron	(pH 5) ¹	ш	VI	Copper	lead	mercury
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Rural residential / lifestyle block 25% produce	17	>10,000	0.8	>10,000	290	>10,000	160	200
Residential 10% produce	20	>10,000	3	>10,000	460	>10,000	210	310
High-density residential	45	>10,000	230	>10,000	1,500	>10,000	500	1,000
Recreation	80	>10,000	400	>10,000	2,700	>10,000	880	1,800
Commercial / industrial outdoor worker (unpaved)	70	>10,000	1,300	>10,000	6,300	>10,000	3,300	4,200

Table B2: Soil contaminant standards for health (SCSs(health)) for inorganic substances

Notes: All concentrations refer to dry weight (ie, mg/kg dry weight).

TABLE 6: GUIDELINE VALUE TABLES B2 - SCS(health) APPENDIX B MFE USERS GUIDE (2012)

					Dioxin		
Scenario	BaP ¹	DDT	Dieldrin ²	PCP	TCDD	Dioxin-like PCBs	
	mg/kg TEQ	mg/kg	mg/kg	mg/kg	µg/kg TEQ	µg/kg TEQ	
Rural residential / lifestyle block 25% produce	6	45	1.1	55	0.12	0.09	
Residential 10% produce	10	70	2.6	55	0.15	0.12	
High-density residential	24	240	45	110	0.35	0.33	
Recreation	40	400	70	150	0.6	0.52	
Commercial / industrial outdoor worker (unpaved)	35	1,000	160	360	1.4	1.2	

Table B3: Soil contaminant standards for health (SCSs_(health)) for organic compounds

Notes: All concentrations refer to dry weight (ie, mg/kg dry weight or µg/kg dry weight).
RESULTS AND INTERPRETATION

The analytical results were received from Hills on the 17th April 2023 and compared with the SCSs_(health) for Residential 10% Produce. Reference is made throughout to relevant national soil survey for data comparison. In any instance, non compliant values are given in *red italics*.

- Table 7 A, B, C & H Series Composites Heavy Metals
- Table 8 Organochlorine Composites A1; A4; H1 & H4 & B2; B3; C2 & C3
- Table 9 Individual Replicate QA/QC Samples X 1& S1Heavy Metals RPD
- Table 10 Rinsate Sample Arsenic

COMPOSITE SAMPLING

TABLE 7: RESULTS OF ANALYSIS A, B, C & H SERIES COMPOSITES HEAVY METALS IN COMPARISON WITH SCSs(HEALTH) RESIDENTIAL 10% PRODUCE

HEAVY METALS mg/kg ⁻¹ dry wt	COMPOSITE A1-4	COMPOSITE B1- 4	COMPOSITE C1- 4	COMPOSITE H1- 4	SCSs _(health) Residential 10%
ARSENIC	<2	<2	<2	<2	20
CADMIUM	0.10	0.12	0.11	0.11	3
CHROMIUM	40	47	38	49	460
COPPER	25	16	11	11	>10 000
LEAD	5.5	6.9	5.4	4.9	210
NICKEL	24	17	11	12	N/A
ZINC	7	5	<4	6	N/A

ALL RESULTS WERE COMPLIANT

Variation between composites was low, showing little anthropogenic influence on soil analytes, over a typical background field range for site *OK* soils, reflecting long term use of the site. Copper displayed the widest variation, very commonly marked in ex orchards.

Arsenic results were closely aligned with median for Northland basalt derived soils of 2.2 mg/kg⁻¹.¹⁶ Arsenic is the most commonly influenced analyte in a range of production and domestic situations. A national review found Auckland region ex production soils¹⁷ to range between 2-34 mg/kg⁻¹ while residual landscaping can result commonly in levels well in excess of the generic SCS_(health) e.g. arsenic beneath NZ decks¹⁸ constructed from CCA treated timber average 76 mg/kg⁻¹ dry wt.

The cadmium results reflect a similar low intensity of fertilizer use across all composites, in comparison to a national background of 0.10 mg/kg⁻¹. It is of no concern in regard to the $SCS_{(health)}$ 3 mg/kg⁻¹ for

¹⁶ Cavanagh, J. McNeill, S. Arienti, C. & Rattenbury, M. (2015) Background soil concentrations of selected trace elements and organic contaminants in New Zealand. Envirolink Tools Grant: C09X1402. Landcare Research

¹⁷ Gaw, S. K (2006) Trace element and DDT concentrations in horticultural soils from the Tasman, Waikato and Auckland regions of New Zealand. Science of the Total Environment 355: 31– 47.

¹⁸ ERMA (2003) Report on CCA Treated Timber

residential purpose.

Copper above background typically arises from the focused use of copper-based fungicides on horticulture. Auckland properties were found to have a median level of 207 mg/kg⁻¹ where a warmer, wetter climate (as per that of Northland) results in higher use and residual copper levels in comparison to southern orchard regions e.g. Tasman¹⁷. From professional experience production can easily give results >40mg/kg⁻¹ from minimal use in Kerikeri. Levels lower than the predicted background are typical of *OK* soils true background.

Lead was consistently below 15.5 mg/kg⁻¹ median expected background level and published sources to 178 mg/kg⁻¹ for ex production land, typically from concentrated vehicle use or lead arsenate.^{17 16}

Chromium was of no concern. Significant variation in Cr is often based on location and lithology rather than landuse. Note the Cr SCS_(health) is given in *Table 7* as the more stringent Cr IV standard.

Nickel and zinc were of no concern, aligned with background values. All zinc and nickel sampling results were within background range¹⁶ and of no concern in comparison to the aforementioned Australian NEPM HILS (Zinc- 7400 mg/kg⁻¹, Nickel - 600 mg/kg⁻¹). *Refer above - Sampling and Analysis: Design.*

TABLE 8: RESULTS OF ORGANOCHLORINE ANALYSIS COMPOSITE A1; A4; B3 & C1 IN COMPARISON WITH SCSs(HEALTH) RESIDENTIAL 10% PRODUCE

ORGANOCHLORINES mg/kg ⁻¹ dry wt	COMPOSITE A1; A4; H1; H4	COMPOSITE B2; B3; C2; C3	SCSs _(health) Residential 10%
DDT _(total)	<0.008	<0.008	70
DIELDRIN	<0.014	<0.014	2.6

The SCS_(health) DDT represents total DDT isomers, or the sum of DDT and its breakdown metabolites DDE and DDD from laboratory analysis. All results were compliant – close to detection limits and very low compared to a median result of 1.28 mg/kg⁻¹ recorded for ex orchard land in the Auckland region¹⁷. All other agrichemicals from the organochlorine suite were at or close to detection limits across all sampling and of no concern, refer full results *Appendix 3*.

QA/QC ANALYSIS

A replicate sample was taken as outlined in *Sampling and Analysis: Design,* results shown below in *Table 9.*

The individual sample and replicate result was compliant and showed general fidelity with the wider site composite results.

The replicate sample demonstrated well aligned results to that of the primary sample (RPD relative percent difference <40%), indicating satisfactory field accuracy of sampling technique and reliability of data. (MfE CLMG.5 2021). Neither the replicate result or implied potential level of variation is of concern in comparison to the SCS_(health) or in regard to broad acreage composite values.

Relative percentage difference = (Result 1 – Result 2) x 100

Mean Result

TABLE 9: RESULTS OF ANALYSIS INDIVIDUAL X1/REPLICATE S1 HEAVY METALS & RPD

HEAVY METALS	INDIVIDUA	L SAMPLES	SCSs _(health)	RPD %
	X1	S1	10%	
Arsenic	<2	<2	20	0
Cadmium	<0.10	<0.10	3	0
Chromium(total)	37	40	>10 000	7
Copper	8	9	>10 000	12
Lead	5.1	5.3	210	3.8
Nickel	10	11	N/A	0
Zinc	<4	<4	N/A	0

A rinsate arsenic screen was taken from sampling equipment during the sampling period, as below:

TABLE 10: RESULTS OF AQUEOUS ARSENIC RINSATE SAMPLE

	SAMPLE W1
AQUEOUS	<0.03
ARSENIC	10.05
g/m ³	

The rinsate result for arsenic, as the contaminant of concern, indicated effective decontamination procedures and no significant influence on arsenic or other analytical results in terms of total value or cross contamination.

SAMPLING OBSERVATIONS

- No groundwater was encountered
- No ACM, staining or odour was noted
- Frequent worms
- No ash was encountered
- Visual observation during soil sampling confirmed the documented geology

SITE CHARACTERISATION & DISCUSSION

The piece of land subject of the proposal to build a new dwelling is is located within a former production parcel of extended history encompassing the critical period of persistent agrichemical usage in NZ.

Subdivision of the original orchard parent parcel occurred in 1996, preceding the NES- CS (2011) regulations and there has been no prior reporting in the interim.

A PSI was required for the current *change of use* proposal, comprised of construction of a residence and subsequent occupation on former production land, as the land had *more likely than not* been subject to HAIL activity:

• A10 Persistent pesticide bulk storage or use (HAIL List 2011)

The initial *<u>qualitative</u>* Conceptual Site Model (CSM) suggested low but sufficient risk to warrant sampling of the Lot. This provides quantitative reassurance of the qualitative desktop inferences and confirms suitability of the activity.

All analysis results for metals and organochlorines as the potential contaminants of concern were compliant, validating the qualitative information obtained about the site. Despite being subject to activities on the HAIL list, a site will not necessarily have contaminant substances present in the soils at levels that are hazardous to human health (MfE 2012). Due to the lack of any exceedances; absorptive nature of the soils in respect to the likely original surface application of analytes and their aged nature, it is considered that levels will not display increase to depth. Returned results are taken to be representative of maximum contaminant levels deeper within the soil profile for earthworks.

The permitted activity level of soil disturbance is calculated as 271.65 m³, which is in excess of requirements as per quantities supplied (Advance Build Scheme C01 Nov 22). Based on the sampling results soils **may** be considered *cleanfill*, as not in excess of predicted background analyte levels for Kerikeri basalt soils. However, for ease of process, in regard to any further NES-CS (2011) regulatory requirements relating to earthworks, excess soil may be retained onsite.

Upon revision and refinement of the potential contaminant – receptor linkages initially identified in the qualitative CSM, *it is highly unlikely there will be a risk to human health* if the proposed activity of change of use occurs.

The revised *quantitative* Conceptual Site Model is illustrated in figures below:

FIG 6: FINAL QUANTITATIVE CSM



It should be noted that the future construction may result in elevated soil heavy metals e.g. from the use/ storage of bulk CCA tanalised timber, causing a site that has been screened at a given point later having levels raised in excess of SCS_{(health).} It is recommended that in the event of building that any outside storage of bulk treated timber be covered by tarpaulin and located within an area of existing or intended driveway or parking area during the building phase, so as to avoid potential contamination of lawn and garden areas from leaching. CCA-treated wood must not be burnt, as arsenic is volatised to air and residual in the ash in excess of the SCS_(health) (ERMA 2003).

CONCLUSION & RECOMMENDATION

This Preliminary Site Investigation combined qualitative and quantitative information obtained through the scope of reporting to determine the degree of potential and actual soil contaminants in relation to the SCS_(health) regarding anticipated *change of use* activity of Lot 1 DP 174247, 137 Wiroa Rd, Kerikeri.

Due to historic production activity, the primary HAIL activity was considered

• A10 Persistent pesticide bulk storage or use (HAIL List 2011)

Potential contaminants in site soils were found to be at levels that, even allowing for complete *contaminant – exposure- receptor* pathways, pose no risk to human health in comparison to the generic SCS_(health)Residential 10% Produce.

It is highly unlikely that there is any risk to human health from the *change of use* activity, which may proceed as permitted activity in this regard.

Soil disturbance for the proposed residential occuation is given as 37.17 m³ is within permitted activity limits as per NES- CS Regulation (3)c of 271.65m³.

RINLodge

Rebecca Lodge SQEP BScEcology PGDipSci (Distinction) Botany

PSI CERTIFYING STATEMENT

I, Rebecca Lodge of BAY ECOLOGICAL CONSULTANCY LTD, certify that:

This Preliminary Site Investigation meets the requirements of the Resource Management (National Environmental Standard for assessing and managing contaminants in soil to protect human health) Regulations 2011 because it has been:

a. done by a suitably qualified and experienced practitioner, and

b. reported on in accordance with the current edition of Contaminated land management guidelines No 1 – Reporting on contaminated sites in New Zealand, and

c. the report is certified by a suitably qualified and experienced practitioner.

Evidence of the qualifications and experience of the suitably qualified and experienced practitioner(s) who have done this investigation and have certified this report is appended below:

PROFESSIONAL PROFILE

Rebecca Lodge:

Since its implementation I have been reporting within the current Resource Management Regulations 2011 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health to DSI and Remediation/Validation level in the Far North & Kaipara District, building extensive professional and local knowledge.

University studies to a post graduate level at Otago provided me with a solid background in laboratory and field based botanical and ecological research. Key components included practical and project work in ecophysiology, conservation biology and ecosystem function, plant ecology, taxonomy and identification. I have been working fulltime as an Environmental Practitioner for the last 10 years, using my research, analysis and writing capabilities professionally.

Core practical abilities developed within a laboratory environment were the knowledge of and adherence to best practice laboratory standards (to PC2 level) hazardous waste and biosecurity training, as well as use of microscopy, field equipment, and software. I have completed professional training in asbestos in soils awareness and management.

I am able to design experiments and sampling programmes to provide robust data for analysis and subsequently delivery of relevant results. My knowledge of field procedures and techniques is complimented by observation and qualitative interpretation skills.

In 2008, based on my academic results, independent research abilities and PhD proposal I was awarded a prestigious Te Tipu Putaiao Fellowship through the governmental Foundation for Science Research and Technology. The proposed research focused on the ecotypic variation across NZ of Cordyline australis and C. indivisa in terms of leaf and fibre properties, related in turn to insect vulnerability and as a traditional fibre resource for weaving and cordage. It was a multidisciplinary and complex study integrating elements of historical and scientific literature review; ecology, botany and textile science as well as Matauranga Maori.

Access to resources and material for the study also required liaison with other stakeholders, including Manaaki Whenua, Crop and Food Research NZ and DoC.

The research component of my PGDipSci revealed the previously un-described diet of the alpine weta, <u>Hemideina maorii</u>, based on field studies and extensive laboratory analysis of remnant plant and insect matter. This was compared to a digital cuticle library I developed. This work has since been expanded on by others and referenced in further studies on this species.

I have been employed as a laboratory and field demonstrator both within the Otago University Botany and Ecology departments, organising and assisting in the labs and on field excursions. More recently I have lectured at Northtec on the identification and description of wetlands and the relevant application of the NPS- FM & NES-F (2020). I have also used my skills professionally as a research assistant.

I am a member of several industry bodies and research focused sector communities including ALGA, NZ Ecological Society and the NZ Freshwater Science Society.

APPENDIX 1: HISTORICAL AERIAL IMAGERY

Photography provided by

- RETROLENS (Sourced from http://retrolens.nz and licensed by LINZ CC-By 3.0)
- GOOGLE EARTH PRO
- FNDC/ LINZ Aerials
- Topographic Maps http://www.mapspast.org.nz/ and licensed by LINZ CC-By 3.0

Sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0 SCRUB/farm



Sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0 Scrub /farm



Orchard establishing



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Sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0

Orchard establishing shelterbelts further advanced. Ponds dug out on Lot 1 DP 141315



2000 FNDC/LINZ

Orchard



2003 GOOGLE EARTH



2005 FNDC/ LINZ Remains in orchard



2014 FNDC/ LINZ



2022 FNDC/LINZ

No further change. Site continues in this format until recently the mid site hedge and localized area of house are cleared and chipped.



APPENDIX 2: SAMPLE PLAN

A SERIES COMPOSITE A1 A2 A3 A4 – HEAVY METALS B SERIES COMPOSITE B1 B2 B3 B4 – HEAVY METALS C SERIES COMPOSITE C1 C2 C3 C4 – HEAVY METALS HSERIES COMPOSITE H1 H2 H3 H4 – HEAVY METALS

X1 & REPLICATE S1 – HEAVY METALS A1 A4 H1 H4 COMPOSITE- ORGANOCHLORINES B2 B3 C2 C3 COMPOSITE- ORGANOCHLORINES



APPENDIX 3: HILLS LABORATORIES RESULTS & ANALYSIS METHODS



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Certificate of Analysis Page 1 of 2									
Client: Bay Ecological Consultancy Limited Contact: Rebecca Lodge C/- Bay Ecological Consultancy Limited PO Box 229 Kerikeri 0245			Lai Dai Qu Oro Cli Su	b No: te Received: te Reported: tote No: der No: ent Reference: bmitted By:	3229 05-A 17-A 1218 Mas Reb	9998 Apr-2023 Apr-2023 802 ssey ecca Lodg	SPv1		
Sample Ty	ype: Soil								
		Sample Name:	S1 04-Apr-2023 11:15 am	X1 04-Apr-2 11:05 ar	2023 m	Composite of H1, H2, H3 and H4	Compo A2, A	osite of A1, \3 and A4	Composite of B1, B2, B3 and B4
		Lab Number:	3229998.17	3229998.	.18	3229998.20	322	9998.21	3229998.22
Heavy Metal	s, Screen Level								-
Total Recove	erable Arsenic	mg/kg dry wt	< 2	< 2		< 2		< 2	< 2
Total Recove	erable Cadmium	mg/kg dry wt	< 0.10	< 0.10		0.11		0.10	0.12
Total Recove	erable Chromium	mg/kg dry wi	40	37		49		40	47
Total Recove	erable Lood	mg/kg dry wi	9	5 1		11		20	16
Total Recove	arable Nickel	mg/kg dry wt	0.0	0.1 10		4.9		24	0.9
Total Recove	arable Zinc	mg/kg dry wt	1	10		6		7	5
Total Recove		mg/kg dry wr	~4	~4		0			5
Sample Name:		Composite of C1, C2, C3 and Composite of A1, A4, H1 C4 H4		C3					
		Lab Number:	3229998	.23		3229998.24		32	29998.25
Individual Te	ests								
Dry Matter g/100g as rcvd		-			75			76	
Heavy Metal	s, Screen Level								
Total Recoverable Arsenic mg/kg dry wt		< 2			-			-	
Total Recove	erable Cadmium	mg/kg dry wt	0.11			-			-
Total Recove	erable Chromium	nium mg/kg dry wt 38			-			-	
Total Recove	erable Copper	mg/kg dry wt	11			-			-
Total Recove	erable Lead	mg/kg dry wt	5.4			-			-
Total Recove	erable Nickel	mg/kg dry wt			-				
Total Recove	erable Zinc	mg/kg dry wt	< 4			-			-
Organochlor	ine Pesticides S	creening in Soil							
Aldrin		mg/kg dry wt	-			< 0.014			< 0.014
alpha-BHC		mg/kg dry wt	-			< 0.014			< 0.014
beta-BHC		mg/kg dry wt	-		< 0.014			< 0.014	
della-BHC	(Lindana)	mg/kg dry wi	-		< 0.014				< 0.014
	(Lindane)			< 0.014				< 0.014	
trans Chlord	ano.	mg/kg dry wt	-		< 0.014				< 0.014
	ane	mg/kg dry wt	-		< 0.014				< 0.014
2,4-000 4 4'-DDD		mg/kg dry Wt	-			< 0.014			< 0.014
2 4'-DDF		mg/kg dry wt				< 0.014			< 0.014
4 4'-DDF		ma/ka drv wt				< 0.014			< 0.014
2.4'-DDT		mg/kg dry wt	-			< 0.014			< 0.014
4,4'-DDT		mg/ka drv wt				< 0.014			< 0.014
Total DDT Is	omers	mg/kg drv wt	-			< 0.08			< 0.08
Dieldrin		mg/kg dry wt	-			< 0.014			< 0.014
Endosulfan I		ma/ka drv wt	-			< 0.014			< 0.014



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

Sample Type: Soil						
	Sample Name:	Composite of C1, C2, C3 and C4	Composite of A1, A4, H1 and H4	Composite of B2, B3, C2 and C3		
	Lab Number:	3229998.23	3229998.24	3229998.25		
Organochlorine Pesticides	Screening in Soil					
Endosulfan II	mg/kg dry wt	-	< 0.014	< 0.014		
Endosulfan sulphate	mg/kg dry wt	-	< 0.014	< 0.014		
Endrin	mg/kg dry wt	-	< 0.014	< 0.014		
Endrin aldehyde	mg/kg dry wt	-	< 0.014	< 0.014		
Endrin ketone	mg/kg dry wt	-	< 0.014	< 0.014		
Heptachlor	mg/kg dry wt	-	< 0.014	< 0.014		
Heptachlor epoxide	mg/kg dry wt	-	< 0.014	< 0.014		
Hexachlorobenzene	mg/kg dry wt	-	< 0.014	< 0.014		
Methoxychlor	mg/kg dry wt	-	< 0.014	< 0.014		
Sample Type: Aqueor	us	L		·		
	Sample Name:		W1 04-Apr-2023 10:20 am			
	Lab Number:	r: 3229998.19				
Individual Tests						
Total Recoverable Arsenic	g/m³	< 0.03				

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 26 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil					
Test	Method Description	Default Detection Limit	Sample No		
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	17-18, 20-23		
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP- MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	17-18, 20-23		
Organochlorine Pesticides Screening in Soil	Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081.	0.010 - 0.06 mg/kg dry wt	24-25		
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry), gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	24-25		
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-16		
Sample Type: Aqueous					
Test	Method Description	Default Detection Limit	Sample No		
Total Recoverable Extraction	Nitric/Hydrochloric acid extraction, 85°C, 2.75 hours. US EPA 1638.	-	19		
Total Recoverable Arsenic	Nitric/Hydrochloric acid extraction, 85°C, 2.75 hr, ICP-MS, screen level. APHA 3125 B 23rd ed. 2017.	0.02 g/m ³	19		

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 06-Apr-2023 and 17-Apr-2023. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

11

Ara Heron BSc (Tech) Client Services Manager - Environmental

Lab No: 3229998-SPv1

Hill Laboratories

Page 2 of 2

APPENDIX 4: TITLES & PLANS



RECORD OF TITLE UNDER LAND TRANSFER ACT 2017 FREEHOLD



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

Identifier	NA105D/315	
Land Registration I	District North Auckland	
Date Issued	05 August 1996	
Prior References		
NA106D/949	NA83D/521	
Estate	Fee Simple	
Area	1.9640 hectares more or less	
Legal Description	Lot 1 Deposited Plan 141315 and Lot 1	
	Deposited Plan 174247	
Registered Owners	3	
James Massey and Ja	ane Alison Massey	

Interests

Subject to Section 241(2) and Section 242(1) and (2) Resource Management Act 1991 C581456.2 Mortgage of part to The National Bank of New Zealand Limited - 23.3.1994 at 2.58 pm

Transaction ID 70525406 Client Reference Quickmap Guaranteed Search Copy Dated 27/09/22 1:43 pm, Page 1 of 3 Register Only



NA105D/315







Transaction ID 70525406 Client Reference Quickmap Guaranteed Search Copy Dated 27/09/22 1:43 pm, Page 3 of 3 Register Only

1942 NZMS1 N11

Area generally described as gorse, low scrub & grass



1969 NZMS1 N11



7411-TCPTPC 1969 SURVEY PLAN WIROA C2 BLOCK

Owner Mr R.D Glass. Subject Lot located within Lot 2



1990 BIC2601 SUBDIVISION LOT 2 D61960 (CT 17D/1057)





RC PA362 21/2/1979 K LUPI RESOURCE CONSENT TO MOVE ON HOUSE **PUBLIC NOTICES**

NOTICE OF APPLICATION FOR CONSENT TO CONDITIONAL USE

the property is at Aero-drome Rd, Kerikeri.

drome Rd, Kerikeri. Notice is hereby given that application has been made by K. M. Lupi of Kerikeri for consent to re-erect a second hand dwelling on a substandard Allotment in the Rural A Zone.

Allotment in the Rural A Zone. The property is on the S. side of Aerodrome Rd, at Kerikeri and is located in the Rural A Zone. The legal description of the land is Lot 2 D.P. 619 60 Block 1 Kawakawa S.D. The application may be examined at the office of the Bay of Islands County Council, Kawakawa, during normal office hours and any person or body affected may object to the applica-tion by notice in writing delivered to the County Clerk, Bay of Islands County Council, P.O. Box 11, Kawakawa not later than 4.00 p.m. on 10 February, 1977. A copy of the objection is required to be served on the applicant. Every objector shall state the grounds of the objection and whether he wishes to be heard by the Council in support of his objection. Date 8th January, 1977.

objection.

Date 8th January, 1977. Signed: K. M. LUPI. Signed: K. M. LUPI. Inis is the first publica-tion this notice. 3468

NOTICE OF APPLICATION FOR CONSENT TO CONDITIONAL USE

the property is at Aero-drome Rd, Kerikeri. Notice is hereby given that application has been made by K. M. Lupi of Kerikeri for consent to re-erect a second hand dwelling on a substandard Allotment in the Rural A Zone. The property is on the S.

Zone. The property is on the S. side of Aerodrome Rd, at Kerikeri and is located in the Rural A Zone. The legal description of the land is Lot 2 D.P. 619 60 Block 1 Kawakawa S.D. The explication may be

The application may be examined at the office of the Bay of Islands County Council, Kawakawa, during normal office hours and any affected normal office hours and any person or body affected may object to the applica-tion by notice in writing delivered to the County Cierk, Bay of Islands County Council, P.O. Box 11, Kawakawa not later than 4.00 p.m. on 10 February, 1977. A copy of the objection is required to be served on the applicant. Every objector shall state the grounds of the objection and whether he wishes to be heard by the Council in support of his objection.

Date 8th January, 1977. Signed: K. M. LUPI. This is the second publi-cation of this notice. The first publication was made on the 8th January 1977. 3468

PHOTOS OF ORIGINAL HOUSE PROVIDED IN APPLICATON









Home Starter Pack

Authorisation for Council

As the legal owner of property at: 137 WIRDA ROAD RD3 KERIKERI

I give authority and permission for the builder (Advance Manufacturing Ltd) or nominated designer to apply for a PIM Report, Resource Consent and Building Consents on my behalf.

HOME STARTER PACK

Date: 16.08.22 Home Consultant: Tyle Dixon Client/s Name/s: JAMES + JANE MASSEY

Client/s Signature: / Many Jane Makey

SITE SUITABILITY REPORT

137 Wiroa Road, Kerikeri 0293



T&A Structures 14 October, 2022

Table of Contents

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3.	GEOTECHNICAL INVESTIGATIONS	4
4.	MATERIAL PROPERTIES	6
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1. PROJECT

1.1 Project Details

Client's Name	:	Advance Build
Site Address	:	137 Wiroa Road, Kerikeri 0293
Lot Number	:	1
DP Number	:	174247

1.2 Brief

T&A Structures were engaged by Advance Build to undertake a Site Suitability Report with the purpose of checking the suitability of the site for a proposed new dwelling. The site assessment was carried out on 12 September 2022.

This report undertakes to:

- Describe the soils at the site;
- Quantify sub-soil conditions to allow selection of foundation types;
- Note any pertinent features of the land;
- Make recommendations regarding further investigations if necessary.

It was understood that the Client proposes to construct a single-level timber-framed house. The house is pre-fabricated in the factory and to be transported to the site.

2. SITE DESCRIPTION

The site for the proposed dwelling is generally flat. At the time of the investigation the site was grassed. There was no any existing structure in the property. Access to the site is achieved directly from Wiroa Road from the north-west.

The site is generally well-drained. At the time of investigation there were no wet spots or vegetation normally associated with wet conditions in the property.

3. GEOTECHNICAL INVESTIGATIONS

3.1 Geology

The land is described in the New Zealand Land Inventory NZMS 290 series as Okaihau gravelly friable clay (OK).



3.2 Available Information

The following information has been provided to us:

Concept plans

3.3 Subsurface Investigations

The investigations undertaken included a walkover inspection, one augered borehole and four Scala Penetrometer tests. The location plan of the test holes is attached below.

The borehole logs are attached as Appendix 1 to this report. The depths of strata on the Engineer's log are measured from ground levels at each exploratory hole.



3.4 Subsurface Findings

The subsoil materials were found to have the following bearing capacities 1400mm below existing ground level:

	BEARING CAPACITY (kPa)	DESCRIPTION
Allowable bearing capacity	100	the reading the inspector obtained with any specialised equipment
Ultimate bearing capacity	300	value = 3 times the allowable bearing capacity
Ultimate dependable bearing capacity	150	value = 1.5 times the allowable bearing capacity

From the results of our preliminary investigations, we were able to establish that in the area of the proposed house site, the subsurface soils comprised of approximately 1000mm to 1400mm thick, soft clayey soil. Ground water was encountered at approximately 500mm bgl. It should be noted however, that ground water table varies according to season.

The top 1400mm of soil was soft and not suitable for foundation designed according to the NZS3604:2011 requirements. Below 1400mm bgl, the subsoils were stiffer and consistent in strength.

The subsurface conditions are detailed on the borehole logs in Appendix 1. The observations noted in the investigations have been extrapolated between the various test locations to infer probable site conditions. It is noted that these inferences in no

way guarantee the validity of these findings due to the inherent variability of natural soil deposits. The actual ground conditions discovered during excavation may vary from what is reported herein.

4. MATERIAL PROPERTIES

Soil shear strengths (measured with shear vane, BH5) range from 90kpa to 160kpa, with mean shear strength of about 110kpa.

The four Scala Penetrometer tests (BH1 to BH4) carried out within the proposed house footprint generally reached 100 kpa (3.3 blows per 100mm) allowable soil bearing capacity at 1.40 mbgl and consistently have higher readings as the scala was driven down.

5. STORMWATER AND SEWERAGE

The FNDC 3 Waters Map indicated that both the council's wastewater and stormwater reticulated system are not available in this site for the wastewater and stormwater disposal. The concept drawings provided for this study however, indicated that these requirements have already been sorted out.

Any site-specific stormwater management design and/or wastewater disposal system design, if required, is outside the scope of this report.

6. NATURAL HAZARD

The NRC Natural Hazards Map indicated that as of writing this report, there were no any natural hazard affecting the property which could affect the proposed development.

7. ASSESSMENT

7.1 Expansiveness

Based on the results of our field investigation, along with our knowledge and experience with these kinds of soils, we classify the investigated site as moderately expansive in terms of AS2870:2011. Expansive soils are prone to shrinkage and swelling effects resulting from moisture changes from within the soil.

We note that no laboratory testing of the material to confirm the soil expansivity was undertaken.

7.2 Site Stability

The site did not appear to be subject to creep or instability. There appear to be no recent ground movement on the site. It is also anticipated that the proposed development will not affect or worsen the current stability of the site.

7.3 Earthworks and Retaining Structures

As mentioned earlier, the site is relatively flat. We do not anticipate that this development will involve considerable earthworks and retaining.

7.4 Liquefaction Potential

Liquefaction occurs when the structure of a loose, saturated sand breaks down due to some rapidly applied loading such as earthquake shaking. As mentioned above, the soil in the site is clay. In addition, the site is in Northland where earthquake occurrence is considered unlikely. Hence, it is considered that liquefaction is unlikely to occur in this site.

A detailed liquefaction assessment for this site is outside the scope of this study.

7.5 Foundation System

The soils on this site are considered to be moderately expansive and soft. The soils do not comply with the definition of "good ground" as noted in NZS3604:2011. It is however, considered that the site is suitable for the proposed development. The following are the recommended foundation options:

- Specifically designed pile foundation. Due to shallow water table, it is
 recommended that the piles be driven. The piles can be pre-drilled 500mm
 into the ground. Basing from the results of the soil investigation, it can be
 estimated that the length of pile embedment into the ground would reach
 3000mm. It is recommended that a test pile should be driven to determine the
 probable length of piles needed before purchasing the pile materials.
- Where a shallow foundation is preferred, a specifically designed ribraft slab foundation is recommended. The top 600mm of soil topsoil is recommended to be taken out and be replaced compacted hardfill, preferably Gap 65 or 40. The foundation should be designed for maximum allowable soil bearing capacity of 50kpa (150kpa ultimate soil bearing capacity).
8. OTHER RECOMMENDATIONS

- In case of shallow foundation, the exposed subsoils should be examined, and any potential soft spots are to be further examined and then removed as appropriate. Replacement fill shall be GAP 65 or GAP 40 placed in layers not exceeding 150mm thick and compacted with a suitable compactor. Any fill exceeding 600mm thick should be tested for compaction.
- All stormwater collected from roofed and paved surfaces together with discharges from retaining walls and other subsoil drains shall be controlled and piped away from the proposed building footprint. Ensure that no uncontrolled runoff or concentrated discharges are directed onto open ground, into soakage pits or into subsoil drainage systems.
- Fill materials beneath any on-ground slab shall be GAP 65 or GAP 40 placed and compacted in layers not exceeding 150mm thick. Any fill exceeding 600mm thick should be tested for compaction.
- In case of shallow foundation, an engineer should inspect the earthworks, building flatform construction and foundation prior to the concrete being poured to ensure that the actual soil parameters are as mentioned in this report or better. Producer Statements PS4 – Construction Review should be required for each of these stages.

9. LIMITATIONS

- Our responsibility for this report is limited to the Client named in this report. We disclaim all responsibility and will accept no liability to any other person unless that party has obtained the written consent of T&A Structures. T&A Structures reserves the right to qualify or amend any opinion expressed in this report in dealing with any other party. It is not to be relied upon for any other purpose without reference to T&A Structures.
- Recommendations and opinions in this report are based on data obtained from the investigations and site observations as detailed in this report. The nature and continuity of subsoil conditions at locations other than the investigation bores and tests are inferred and it should be appreciated that actual conditions could vary from the assumed model.
- It is essential that this office be contacted if there is any variation in subsoil conditions from those described in this report as it may affect the design parameters recommended.
- This report was carried for the purpose of checking the ground with respect to the proposed development. This should not be taken as a full geotechnical report.
- Our professional services were performed using a degree of care and skill normally exercised, under similar circumstances, by reputable consultants practicing in this field at the time.

Teo Pilapii

Chartered Professional Engineer Structural Engineer, CMEngNZ CPEng

T&A STRUCTURES

10. APPENDIX 1: BORE LOGS

BORE	H	OLE LO	G	BH1	Job No. 215-FND-22SD			
Address 137 Wiroa Road, Ke			oad, K	erikeri 0293				
Client		Advance Bu	ild					
Borehole	Loca	ation		Refer to site plan				
Surface e	leva	tion			Datum Ground level			
Surface C	cond	ition		Grassed				
	3	6888						
	Ň							
Fill		Topsoil		Sand Clay Silt				
Depth mm	G.W.L	Geologic Unit	Graphic Log	Field Description	Undrained Shear Strength (kPa) Corrected (Per NZGS guideline) 50 100 150 200 Scala Penetrometer (blows/ 100 mm) 3 6 9 12			
300 600 900 1200 1500 1800 2100 Drill Methoc Date Drilled Drilled by		Scala penetro 12 Sep 2022 Teo	meter	N <u>OTE</u> : The subsurface data describe location. Such data will not identify an	0 0			
Shear Vane	No	100			,			
	Shear Vane No Tests T& STRUCTURES In situ shear vane reading CHARTERED PROFESSIONAL ENGINEERS Scala Penetrometer www.tastructures.co.nz 100 kPa reference line							

BORE	H	OLE LO	G	BH2	Job No.	215-FND-22S	D
Address 137 Wiroa Road, Ke			oad, K	erikeri 0293			
Client		Advance Bu	ild				
Borehole	Loca	ation		Refer to site plan			
Surface e	levat	tion			Datum	Ground lev	/el
Surface C	condi	tion		Grassed			
8888	3			1979-1971 - 1979-1971 - 1979-1971 - 1979-1971 - 1979-1971 - 1979-1971 - 1979-1971 - 1979-1971 - 1979-1971 - 19			
	3						
Fill		Topsoil		Sand Clay Silt			
Depth mm	G.W.L	Geologic Unit	Graphic Log	Field Description	Undrained SI Corrected (P 50 10	hear Strength (kPa) er NZGS guideline) 0 150 200	Scala Penetrometer (blows/ 100 mm) 3 6 9 12
300 600 900 1200 1500 1800 2100 Drill Methoc Date Drilled		Scala penetror 12 Sen 2022	meter	NOTE : The subsurface data described above has	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	rmined at this sp	
Date Drilled 12 Sep 2022			location. Such data will not identify any variations	away from	this location		
Drilled by	No	160					
Snear vane	INO		*********			Tanta	
			G T	RUCTURES FESSIONAL ENGINEERS info@tastructures.co.nz	In situ Remo Scala 100 k	Tests u shear vane rea oulded shear van Penetrometer Pa reference line	ding e reading •

BORE	HOLE LOO	GΙ	BH3	Job No. 2	215-FND-22S	D	
Address 137 Wiroa Road, Ke			erikeri 0293				
Client Advance Build							
Borehole Lo	ocation		Refer to site plan				
Surface ele	vation			Datum	Ground lev	el	
Surface Co	ndition		Grassed				
	8888		8888 FFFF FFF				
Fill	Topsoil		Sand Clay Silt				
Depth mm	Geologic آب Unit	Graphic Log	Field Description	Undrained Sh Corrected (Pe 50 100	ear Strength (kPa) er NZGS guideline)) 150 200	Scala Penetrometer (blows/ 100 mm) 3 6 9 12	
300 600 900 1200 1200 1500 1800 1800 2100 Drill Method Date Drilled Drilled by	Scala penetrome 12 Sep 2022 Teo	eter	NOTE : The subsurface data described above ha location. Such data will not identify any variations	0 0 0 0	mined at this sp	ecific borehole	
Sheer Vana M				away noni u			
Shear Vane No Tests T&A STRUCTURES In situ shear vane reading CHARTERED PROFESSIONAL ENGINEERS Remoulded shear vane reading Scala Penetrometer • 100 kPa reference line 100 kPa reference line							

BORE	H	DLE LO	G	BH4	Job No.	215-FND-22S	D	
Address		137 Wiroa Ro	oad, K	erikeri 0293				
Client Advance Build			ild					
Borehole Location				Refer to site plan				
Surface el	evat	tion			Datum	Ground lev	rel	
Surface Co	ondi	tion		Grassed				
	3			०००० विस्त				
	2							
Fill		Topsoil		Sand Clay Silt				
Depth mm	G.W.L	Geologic Unit	Graphic Log	Field Description	Undrained Sl Corrected (P 50 10	hear Strength (kPa) er NZGS guideline) 0 150 200	Scala Penetrometer (blows/ 100 mm) 3 6 9 12	
300 600 900 1200 1200 1500 1500 1800 2100 Drill Method Date Drilled Drilled by		Scala penetror 12 Sep 2022 Teo	meter	NOTE : The subsurface data described above has location. Such data will not identify any variations	0 0 0 0 0 0 0 0 0 0 0 0 0 0	rmined at this sp this location	ecific borehole	
Shear Vano	No	160			anay nom			
Shear Vane No Tests In situ shear vane reading Remoulded shear vane reading Scala Penetrometer 100 kPa reference line								

BORE	IOLE LOG	BH5	Job No. 215-FND-228	SD
Address	137 Wiroa Road, k	Cerikeri 0293	II	
Client	Advance Build			
Borehole Lo	cation	Refer to site plan		
Surface elev	vation		Datum Ground lev	/el
Surface Cor	ndition	Grassed	• • •	
	8888			
Fill	Topsoil	Sand Clay Silt		
Depth mm	Geologic Cuabylic For	Field Description	Undrained Shear Strength (kPa) Corrected (Per NZGS guideline) 50 100 150 200	Scala Penetrometer (blows/ 100 mm) 3 6 9 12
300 600 900 1200 1500 1800 2100		Topsoil, dark grey silty clay, soft dark-grey silty clay with gravel. Ground water becomes yellow clay, very soft, with water Recovery becomes difficult due to water UTP due to water	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
Drill Method	50mm hand auger			
Date Drilled	12 Sep 2022	NOTE : The subsurface data described above ha	s been determined at this sp	ecific borehole
Drilled by	Teo	location. Such data will not identify any variations	away from this location	
Shear Vane N	D			
		RUCTURES FESSIONAL ENGINEERS Info@tastructures.co.nz	Tests In situ shear vane rea Remoulded shear var Scala Penetrometer 100 kPa reference line	e in the second

31 January 2025

Angela Vucich Advance Build Kerikeri, Far North

Re: Confirmation of Site Suitability Report 137 Wiroa Road, Kerikeri 0293

Dear Angela,

As requested, I re-visited the site to carry out additional soil testing to confirm the original Site Suitability Report which was prepared for this job in October 2022. The site visit was carried on 28 January 2025. As part of this visit carried out 2 Scala penetrometer testing and one hand-auger bole hole. The results are attached at the end of this letter.

The 2 Scala penetrometer test have confirmed the original report, i.e., soft ground. The hand-augered bore hole was terminated at 1-metre deep due to the presence of water. Ground water was encountered at 500mm deep from the ground level. This is the same with the original report.

In conclusion, I wish to confirm that the recommendations given in the original report (issued 14 October 2022) are still valid.

If you have any more questions, please don't hesitate to contact me.

Respectfully yours,

Teo Pilapi

Chartered Professional Engineer Structural Engineer, CMEngNZ CPEng T&A STRUCTURES LTD.

BORE HOLE LOG BH1						Job No. 215-FND-22SD		
Address 137 Wiroa Road, Ko			oad, Ke	erikeri 0293				
Client Advance Build			ild					
Borehole	Loca	ition		Refer to site plan				
Surface e	levat	ion			Datum	Ground lev	el	
Surface C	condi	tion		Grassed				
	3			1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -				
	X			888 EEE HHH				
Fill		Topsoil		Sand Clay Silt				
Depth mm	G.W.L	Geologic Unit	Graphic Log	Field Description	Undrained S Corrected (F 50 10	hear Strength (kPa) Per NZGS guideline) 0 150 200	Scala Penetrometer (blows/ 100 mm) 3 6 9 12	
300 600 900 1200 1500 1800 2100 Drill Method		Scala penetron	neter		0 0 <td< td=""><td></td><td></td></td<>			
Date Drilled		28 Jan 2025		NOTE : The subsurface data described above has	been deter	mined at this spe	cific borehole location.	
Drilled by		Teo		Such data will not identify any variations away from	n this location	on		
Shear Vane	No				1			
				RUCTURES FESSIONAL ENGINEERS info@tastructures.co.nz	In siti Rem Scala 100 k	Tests u shear vane read oulded shear van a Penetrometer «Pa reference line	ding e reading •	

BORE HOLE LOG BH2							Job No. 215-FND-22SD		
Address 137 Wiroa Road, K				erikeri 0293					
Client Advance Build			ild						
Borehole Location				Refer to site plan					
Surface e	levat	ion		· · · · · ·	Datum Ground level				
Surface C	condi	tion		Grassed					
	a								
	3								
Fill	-	Topsoil		Sand Clav	Silt				
			D						
Depth mm	G.W.L	Geologic Unit	Graphic Lo	Field Des	cription	Undrained S Corrected (F 50 10	hear Strength (kPa) Per NZGS guideline) 10 150 200	Scala Penetrometer (blows/ 100 mm) 3 6 9 12	
300 600 900 1200 1500 1800 2100 Drill Method		Scala penetror	neter						
Data Datillad		NOTE · The subsurface da	ata described above bas	heen datar	mined at this so	cific horehole location			
Drilled by Tee		Such data will not identify	any variations away from	this location	nineu at tins spe on				
Shoar Vana	No								
						In situ Remo Scala 100 k	Tests u shear vane read oulded shear van a Penetrometer (Pa reference line	ding e reading •	

BORE	EH	OLE LC)G	BH3	Job No.	215-FND-22S	D
Address		137 Wiroa R	oad, Ke	erikeri 0293			
Client		Advance Bu	uild				
Borehole	Loca	ation		Refer to site plan			
Surface e	elevat	tion		·	Datum	Ground lev	el
Surface C	Condi	ition		Grassed			
	a	8222		हरूरुव्य हिस्टिस तत्वत्वत्व			
	8						
Fill		Topsoil		Sand Clay Silt			
Jepth mm	G.W.L	Geologic Unit	aphic Log	Field Description	Undrained S Corrected (F	Chear Strength (kPa) Per NZGS guideline)	Scala Penetrometer (blows/ 100 mm) 3 6 9 12
				Topsoil, dark grey silty clay, soft			
300	-					193	
600				dark-grey silty clay with gravel. Ground water	0	96	
				becomes yellow clay, very soft, with water	0 0	179	
			[]		55		
900					0		
	1			Recovery becomes difficult due to water	21		
				UTP due to water	0		
1000					0		
1200					Ŏ		
					0 Q		
1500					0		
					8		
					0		
1800					0 0		
<u> </u>					0 0 0		
2100					0		
Drill Method	L d	50mm hand a	uqer				
Date Drilled	ł	28 Jan 2025		NOTE : The subsurface data described above has	been detei	rmined at this spe	cific borehole location.
Drilled by		Teo		Such data will not identify any variations away from	n this locati	on	
Shear Vane	e No			1			
						Tests	;
			//		In sit	u shear vane rea	ding 🛛 🗖
	5		ST.	RUCTURES	Rem	oulded shear van	e reading
	HAR	TERED	PRO	FESSIONAL ENGINEERS	Scala	a Penetrometer	•
www.tastructures.co.nz			o.nz	info@tastructures.co.nz	100 kPa reference line ——		