**BEFORE THE HEARING COMMISSIONERS**
**AWANUI**

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| **IN THE MATTER** | of the Resource Management Act 1991 (**RMA** or **the Act**) |
| **AND** | |
| **IN THE MATTER** | of the Proposed Far North District Plan 2022 |

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# STATEMENT OF EVIDENCE OF JOHN FRANCIS PAPESCH (CIVIL ENGINEERING) ON BEHALF OF WAIAUA BAY FARM LIMITED

**4 MAY 2025**

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HOLM | MAJUREY

Mike Holm/Nicole Buxeda
PO Box 1585
Shortland Street
AUCKLAND 1140

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| Solicitor on the record | Mike Holm | Mike.Holm@holmmajurey.nz | (09) 304 0428 |
| **Contact solicitor** | Nicole Buxeda | Nicole.Buxeda@holmmajurey.nz | (09) 304 0424 |

## INTRODUCTION

### Qualifications and experience

1. My full name is John Francis Papesch. I am a Director and Senior Civil Engineer at Haigh Workman Ltd in Kerikeri.

2. I am a Chartered Member of Engineering New Zealand and a Chartered Professional Engineer with two practice fields, being civil and geotechnical engineering. I have a Bachelor of Engineering from the University of Auckland and a New Zealand Certificate of Engineering from the Unitec Institute of Technology.

3. I have over 25 years of experience in civil and geotechnical engineering, with the past 21 years of that in Northland. I have been actively involved in engineering matters of resource consent applications in the Far North District over my past 17 years with Haigh Workman. My role includes working on a diverse range of land development projects in the areas of water, wastewater, stormwater, flooding, earthworks and roading. Recent projects I have managed include:

   (a) Rangitane Riverpark Stages 3-6, where I am the civil and geotechnical lead for subdivision consent, detailed design, and bulk earthworks construction. I was also the civil and geotechnical lead for stage 2 subdivision works.

   (b) Te Puna Waiora RV Ltd (Arvida, Kerikeri), where I was the civil and geotechnical lead for resource consent for a 200-villa retirement village, care facility, clubhouse, and health and wellness centre on a 18 hectare site at the end of Hall Road. This is a 10-year construction project which is approximately 50 % complete.

   (c) Inlet Estate Ltd (Inlet Road, Kerikeri), where I was the civil and geotechnical lead through a plan change, 48-lot subdivision consent, detailed design, and construction. A precursor to this project was a subdivision of the same scale on an adjacent site for the same developer. These sites are now fully developed.

**Expert Witness Code of Conduct**

4. I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note dated 1 January 2023. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

**Involvement in project**

5. For the Waiaua Bay Farm Limited submission, I am providing civil engineering evidence. I have visited the Site during concept development phase with Haigh Workman staff. I have provided project direction and in-house review in respect to our civil engineering scope.

**Purpose and scope of evidence**

6. This evidence covers the following civil engineering matters: stormwater management, wastewater management, water supply and roading. These matters relate to the feasibility considerations for the potential future subdivision and development of 60 dwellings in four areas named the condominium, northern cluster, southern cluster and the village (herein referred to as "the Site"). The Waiaua Bay submission seeks to alter the location of the Golf Living sub-zone to support the development concept presented in the Kauri Cliffs Development Concept & Master Plan 2025 (Master Plan).

7. My evidence relates to the following reports and information prepared by Haigh Workman Limited in respect of this submission:

   (a) Waiaua Living Area, Kauri Cliffs – Infrastructure Review of Draft Masterplan – Job No. 24 212, dated 30 January 2025 (The **Civil Engineering Report**).

**EXISTING ENVIRONMENT**

8. The Site comprises rolling hill land, with development nodes located on elevated pasture. The land dips away from the indicative development clusters into bush clad valleys below, where stormwater promulgates in Waiaua stream and its

tributaries, before discharging to the sea at the northern end of Waiaua Bay.

9. The Site covers two geology units; Waipapa group to the north (where the condominium and northern cluster is sited), and Kerikeri volcanic group to the south (where the southern cluster and village are sited). Both of these geology units typically weather to deep residual soils with varying drainage characteristics. Both residual soil groups are clay dominated, with the Waipapa group residual soils mapped as poorly to imperfectly drained, and Kerikeri volcanic group residual soils mapped as well to moderately well drained.

**TECHNICAL ASSESSMENT**

**Stormwater Management**

10. Low impact stormwater design principles are referred to in the Proposed Far North District Plan as a consideration when resource consent is required for breaching the permitted impermeable surfaces threshold. The term 'Low Impact Design' is derived from Auckland Council's document GD04 *Water Sensitive Design for Stormwater*.

11. The introduction to GD04 notes:

*'WSD approaches focus on reducing or eliminating stormwater runoff generation through source control, and utilising natural systems and processes to manage stormwater quantity and quality effects. WSD is inherently a context-specific approach which utilises a combination of conventional stormwater infrastructure, WSD devices (e.g. swales and raingardens), and enhanced natural systems to achieve the best practical stormwater management outcome. This includes the potential to utilise stormwater as a supply for potable water or irrigation.*'

12. The Master Plan concept includes clustered building platforms and extensive areas of open space resulting in low impervious coverage in relation to the site area. The indicative layout shown in the Master Plan utilises low impact methods consistent with GD04 by virtue of the low impervious coverage, clustering of buildings and large vegetated areas.

13. The Civil Engineering Report identified that downstream flooding is not an issue, as the downstream watercourses are undeveloped, and the site discharges to the sea. On this basis, it was concluded that stormwater attenuation is not

necessary. This approach is consistent with the Northland Regional Plan rules for stormwater discharges and GD04.[1]

14. Water quality issues associated with future stormwater discharges are likely able to be managed by the relatively low percentage of impermeable surfaces signalled by the indicative layout shown in the Master Plan, and by discharging stormwater overland through grass and native vegetation before it enters a watercourse. Sites on moderately well drained (volcanic) soils are also able to consider soakage devices.

15. Protection against erosion can be achieved via dispersive outlets located above stable hillslopes, or formed as piped or open channel flows to stable outfall positions.

16. Subject to future detained design and consent processes, it's likely that appropriate stormwater management can be achieved to avoid any adverse effects.

**Wastewater Management**

17. At the time of future development, each site will need to be serviced by a wastewater management system that complies with the Northland Regional Plan. A central policy of the Regional Plan is that overall water quality is maintained. Wastewater systems that comply with the Northland Regional Plan are not to result in any off-site environmental effects.

18. Due to the soil conditions and available technology, one option for wastewater management systems is for drip irrigation of secondary treated effluent. The Master Plan has large open spaces available for at least 200 % of the effluent application area expected to support residential development.

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[1] Rule C.6.4.2 of the Regional Plan for Northland (operative in part), provides for the diversion and discharge of stormwater from a public stormwater into water or onto land from an impervious area or by way of a stormwater collection system, is a permitted activity, provided (amongst other conditions)

2*) the diversion and discharge does not cause or increase flooding of land on another property in a storm event of up to and including a 10 percent annual exceedance probability, or flooding of buildings on another property in a storm event of up to and including a one percent annual exceedance probability, and*

*6) the diversion and discharge does not cause permanent scouring or erosion of the bed of a water body at the point of discharge.*

19. The low to moderately permeable soils present at the site have a good capacity for attenuating nutrients and pathogens, which limits potential of groundwater contamination. In addition, the groundwater level across the vast majority of the Site, and across all wastewater fields, will likely be significantly greater than the permitted setback of 0.6 m for secondary treated effluent.

20. All effluent application areas will be able to be offset more than 100 m from wetlands, rivers and the coastline. This is greater than the 15 m permitted activity standard for secondary treated effluent under the Regional Plan. This flexibility significantly reduces the chance of surface water contamination from the wastewater systems.

21. If the option of a clustered wastewater system is adopted, it will likely exceed the maximum permitted discharge of 2,000 litres/day under the Regional Plan. All other rules may be complied with. Future detailed design and consenting processes will ensure appropriate assessment of any such discharges.

22. It is likely future wastewater systems will be able to achieve a good level of compliance with the regional plan and as such the proposed rezoning is not constrained by wastewater management considerations

**Water Supply**

23. The site is not connected to a potable water supply, however there is the potential to provide potable water reticulation from a new consented well, via roof water collection, or via a connection to the water storage reservoir nearby.

24. For roof water collection, a typical water supply is expected to comprise three 25,000 litre water tanks per dwelling (a total of 75,000 litres), to provide an adequate supply of water for drinking water and dedicated firefighting water supply.

25. The preferred option for water supply can be secured by future detailed design work, however it is apparent that water supply is not a constraint on the proposed rezoning.

**Roading**

26. It is proposed that a new vehicle crossing is formed onto Matauri Bay Road. A suitable location for the vehicle crossing has been identified that provides at least 170 m of sight

distance which satisfies Austroads[2] requirements with a 2 second driver reaction time, however the sight distance does not satisfy the Transport s42A recommended provision of 210 m[3].

27. A second vehicle crossing is proposed on Tepene Tablelands road, at the position of an existing farm crossing. The sight distance is greater than 110 m which satisfies the Transport s42A recommended provisions

28. Access within the site is intended to remain private. In my view, an appropriate formation would comprise a minimum 5.5 m wide carriageway width[4].

29. The bulk of the accessways can be formed with at-grade construction, however specific civil and geotechnical input will be required for the internal accessway which provides a linkage between the northern and southern cluster. A bridge is also likely required to cross the stream.

30. This linkage between the northern and southern cluster follows the alignment of an existing farm track which is formed across steep slopes of around 20 degrees. The farm track dips down to the stream at a moderately steep gradient of 1 in 5 or 20 %. This linkage may not be suitable for a primary access,[5] but is not required to be constructed for that purpose. It could simply operate as a low traffic internal connection.

31. As a result, it is likely that the condominium and northern cluster primary access will be via the proposed Matauri Bay vehicle crossing, and the southern cluster and village will likely utilise the Tipene Tablelands vehicle crossing. The linkage between the northern and southern cluster is not mandatory to be formed as a primary accessway.

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[2] Austroads Guide to Road Design Part 4a: Unsignalised and signalised Intersections, 2017

[3] TRAN-Table 8 - Minimum sight distances for vehicle crossings as shown on the Transport Network Hierarchy map

[4] FNDC Engineering Standards Table 3-16 Mimimum Width Requirements – Private Access stipulates a minimum 5.5 m surfacing width plus 0.5 m wide shoulders for 6-8 household Units. NZS4404:2010 *Land Development and Subdivision Infrastructure* Table 3.2 Road design standards Figure E3 similarly recommends a minimum 5.5 m carriageway plus a 0.5 m wide shoulder for 1 to 20 dwelling units (~ 200 vehicles per day), with the shoulder increased to 1.0 m width for 1 to 150 dwelling units (~ 1000 vehicles per day).

[5] FNDC Engineering Standards clause 3.2.28.3 Rural Private Accessways stipulates a maximum gradient of 22.2 %. NZS4404:2010 Table 3.2 stipulates a maximum gradient of 20 % for 1 to 6 dwelling units, 16 % for 1 to 20 dwelling units and 12.5 % for 1 to 150 dwelling units

32. Therefore, the internal linkage between the northern and southern cluster will require careful design due to the challenging topography, but I do not consider this to be a constraint on the ability to provide safe access to the proposed Golf Living sub-zone, due to the two suitable vehicle crossings available at Tepene Tablelands Road and Matauri Bay Road.

**POTENTIAL EFFECTS OF THE PROPOSED REZONING**

33. Potential effects of the proposed rezoning can be addressed by implementing appropriate civil engineering solutions designed to comply with the Regional Plan (particularly stormwater and wastewater management) and in general accordance with FNDC Engineering standards and other industry standards such as GD04.

**MITIGATION MEASURES**

34. Mitigation measures can be considered through plan change provisions and/or subsequent consent processes. I comment on those as follows:

35. Earthworks provisions are provided in Rule EW-S1 *Maximum earthworks thresholds* and rule EW-S2 *Maximum depth and slope* of the Proposed Plan. Future development will likely trigger earthworks provisions with associated effects addressed through the resource consent process, or for lesser volumes via the District Council's control of earthworks bylaw.

36. Subdivision in the Golf Living sub-zone is addressed in Rule SUB-R3 which in turn requires compliance with SUB-S3 Water supply, SUB-S4 Stormwater management and SUB-S5 Wastewater disposal (amongst other conditions) which allows those matters to be addressed through the resource consent process. Mr Tuck's recommended amendments to SUB-R3 retain these conditions.

37. There are no impermeable surface provisions in the Golf Living sub-zone. However, stormwater management is addressed in the subdivision chapter and as noted in paragraphs 10 to 16, I am confident discharges can be managed by way of consideration in future design and consenting process.

38. Wastewater provisions are also addressed under the Regional Plan. Management of on-site wastewater systems is also

covered by via the on-site wastewater disposal systems bylaw 2022 and the building consent process.

39. Access provisions are provided in rule KCZ-R7 which as notified, is permissive for formation, maintenance and upgrading of vehicle access. Rules relating to vehicle crossings and access, including private accessways are also captured under TRAN-R2.

40. Mr Tuck has identified that subdivision within the proposed Golf Living sub-zone could not comply with some restricted discretionary performance standards specified at rule TRAN-R2, relating to vehicle crossings and access. This non-compliance would negate the specific restricted discretionary consenting pathway that is provided for subdivision in the Golf Living sub-zone at rule SUB-R3.

41. To address this, Mr Tuck has recommended an additional rule KCZ-R7 PER-2 to specifically manage vehicle crossings and access in the Golf Living sub-zone. I have reviewed Mr Tuck's recommended rule KCZ-R7 and I support the engineering rationale.

42. The requirement in Mr Tuck's KCZ-R7 RDIS-2 for an expert transport assessment ensures a rigorous assessment of any crossing proposal, specific to the Site and road network context. As such, the assessment required by Mr Tuck's rule is an equally (if not more) rigorous management approach than TRAN-R2. The latter defaults to a discretionary activity status and in doing so, fails to provide clear direction to Plan users, in relation to an issue (vehicle crossings) that inherently has a confined range of effects that need consideration.

**CONCLUSIONS AND RECOMMENDATIONS**

43. In my view it is likely that future stormwater and wastewater management systems servicing development facilitated by the proposed rezoning can be managed to comply with the requirements of the Regional Plan.

44. Water supply may be via a reticulated potable water supply formed within the site via a bore, by roof water collection or from a water storage reservoir. it is apparent that water supply is not a constraint on the proposed rezoning.

45. Northern access is able to be formed off Matauri Bay Road from a location which can provide for safe visibility. Southern access can be achieved by upgrading an existing farm

crossing on Tepene Tablelands Road. Internal accessways can be predominantly formed with at grade construction. The linkage between the northern and southern clusters may be challenging to construct, however would only provide a secondary internal connection and is not required as a primary access. I do not consider this to be a constraint on the proposed rezoning.

46. Detailed mitigation measures can be developed via future detailed design and subsequent consent application processes.

**John Francis Papesch**

4 May 2025

**APPENDIX A – TECHNICAL ASSESSMENT**

Waiaua Living Area, Kauri Cliffs

C/O Steve Tuck, Mitchell Daysh
Waiaua Bay Farm Limited

30 January 2025

**Re: Waiaua Living Area, Kauri Cliffs – Infrastructure Review of Draft Masterplan – Job no. 24 212**

## Introduction

Haigh Workman Limited have been engaged by Waiaua Bay Farming Limited (WBFL) to undertake an engineering review of the draft Kauri Cliffs Development Concept and Masterplan, January 2025. The review will include feasibility considerations and constraints for access, stormwater, wastewater and potable water.

## Site Description

The proposed development area is across two lots: Pt Lot 3 DP 50233 and Lot 4 DP 50234. The development site is on ridgelines that are flat to rolling pasture. To the east are steep slopes and gullies down to the coast. The development area is bisected by a gully which is approximately 20m deep. The site drains to the Waiaua Stream.

WBFL proposes to extend the Kauri Cliffs Golf Living sub-zone to include the proposed development area. This assessment is based on the Operative District Plan requirements for the Kauri Cliffs Golf Living sub-zone.

## Proposed development

The draft masterplan includes locations for 60 building platforms. The development concept is for a mix of standalone dwellings in several clusters and a group of attached dwellings in the northern area.

It is proposed the development will be accessed via a new access from Matauri Bay Road and an existing access from Te Pene Tablelands Road. The accessway will link the development with the balance of the Kauri Cliffs property.

## Published Geology and Soil Mapping

Published geology maps indicate the site is underlain by the Kerikeri Volcanic Group (Pvb) and Waipapa Group (TJw and TJwc). Descriptions of these units are included in the table below.

**Table 1 Geological units - GNS**

| Geological unit | Geological unit code | Description |
|---|---|---|
| Kerikeri Volcanic Group | PvB | Basalt lava, volcanic plugs, and minor tuff. |
| Waipapa Group | TJw | Massive to thin bedded, lithic volcaniclastic metasandstone and argillite, with tectonically enclosed basalt, chert and siliceous argillite. |

| | | |
|---|---|---|
| Waipapa Group | TJwc | Beds dominated by chert and siliceous argillite. |

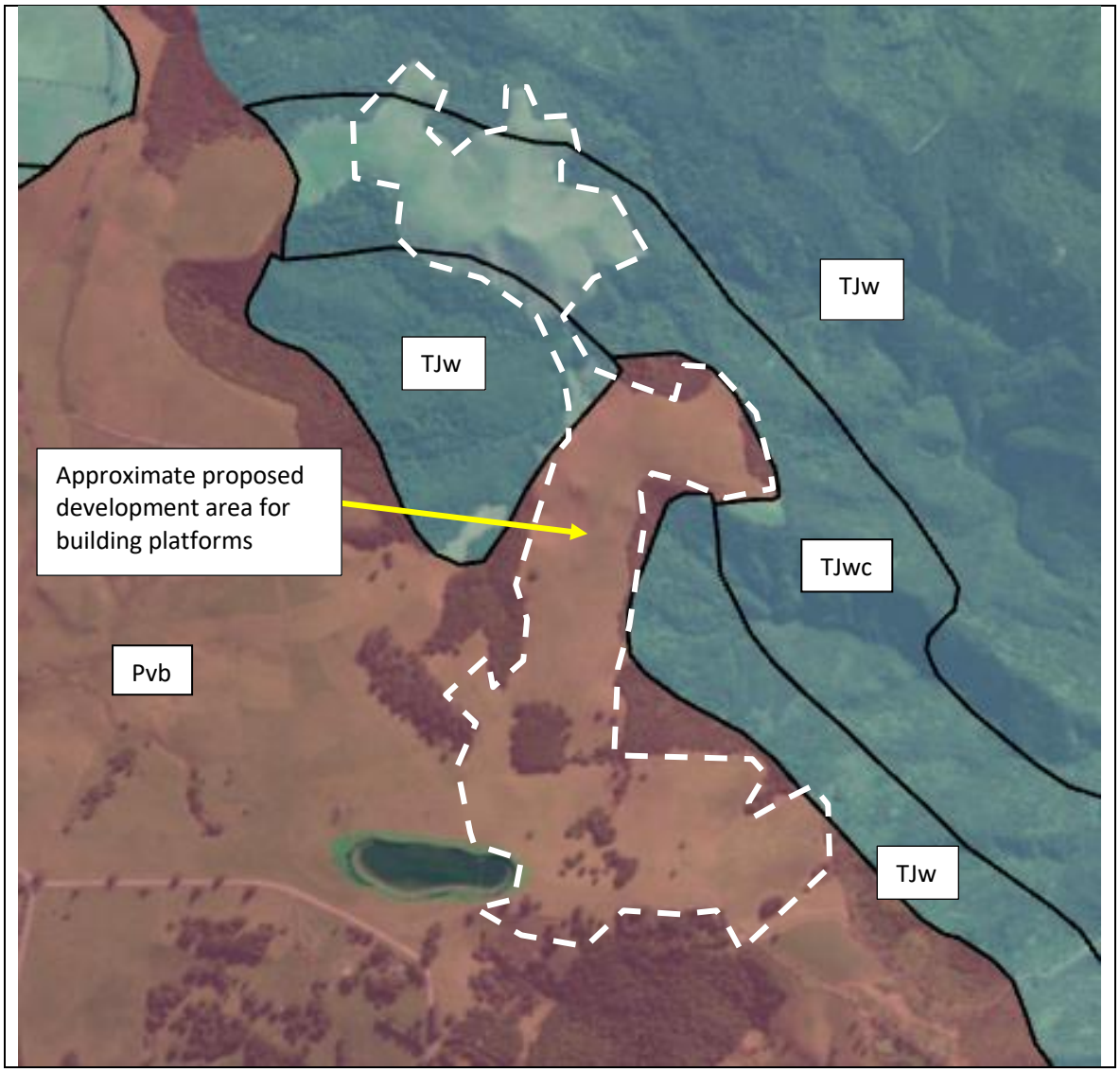


**Figure 1 - GNS Geology Map**

Soils mapped in the New Zealand land inventory maps (1:100,000) as being present are shown in Table 2 and Figure 2 below.

**Table 2 - Soil units, New Zealand Land Inventory (1:100,000), Sheet P04/05**

| Soil unit | Soil unit code | Drainage |
|---|---|---|
| Otaha gravelly clay loam | ODg | Imperfectly to very poorly drained. |

| | | |
|---|---|---|
| Otaha clay | OD | Imperfectly to very poorly drained. |
| Wharekohe sandy loam | WKa | Imperfectly to very poorly drained |
| Waiotu friable clay | YOH | Well to moderately well drained. |
| Rangiora clay, clay loam and silty clay loam | RAH | Imperfectly to very poorly drained. |
| Te Ranga steepland soils, light brown clay loam and stony clay loam | TRuS | Excessively to somewhat excessively drained. |

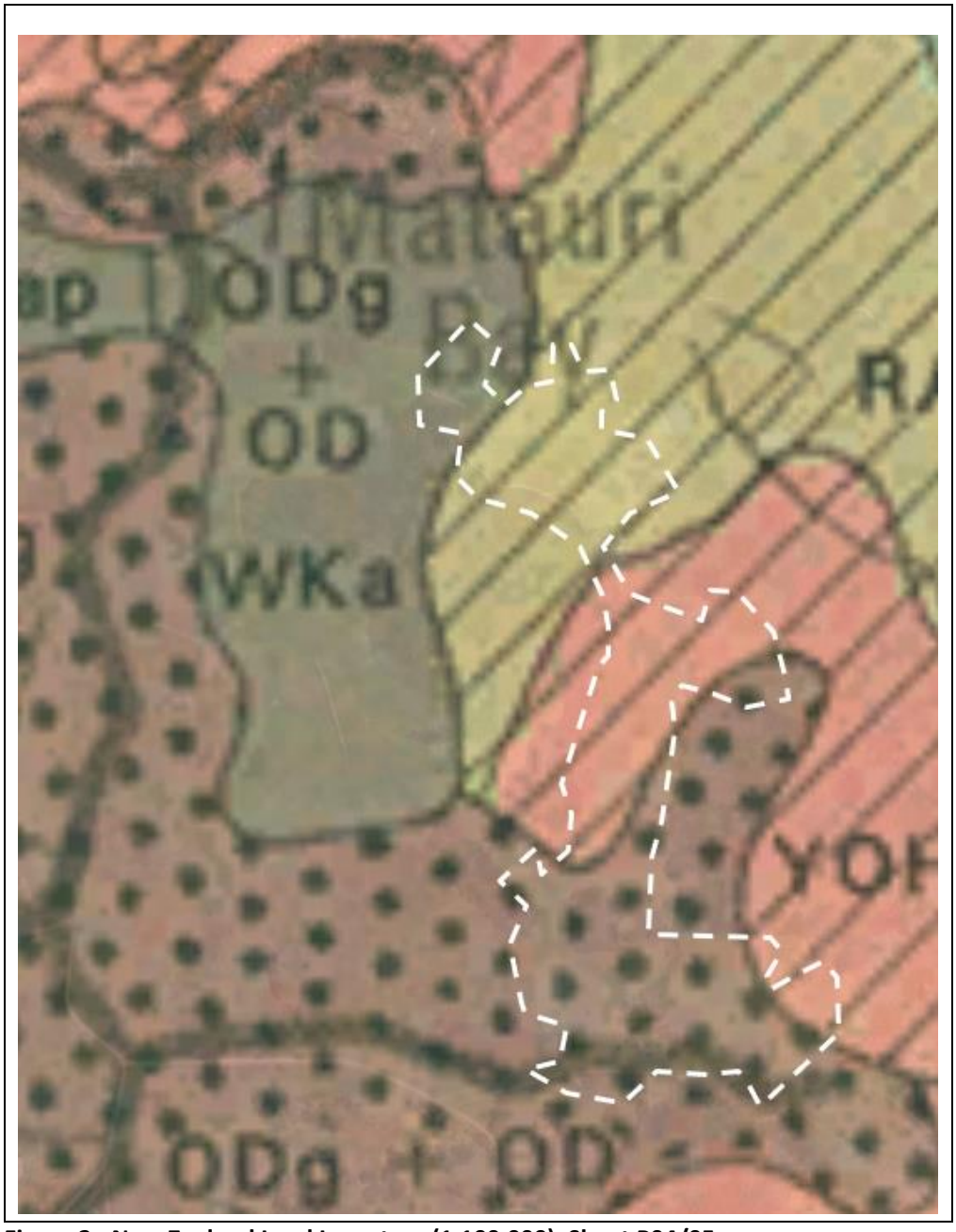


**Figure 2 - New Zealand Land Inventory (1:100,000), Sheet P04/05**

## Wastewater

It is assumed that each of the 60 proposed building platforms will eventually have 4+ bedroom dwellings constructed on it. Wastewater generation and required disposal area for the proposed development once completed is shown below. The below shows daily waste generation should all dwellings be occupied based on each of the dwellings having 4 bedrooms.

Wastewater generation calculations are based on NZS 1547 soil characterisation based on published sol mapping.

**Table 3 – Approximate daily wastewater generation and disposal**

| Wastewater generation per person (litres) | Occupancy allowance per dwelling | Wastewater generation per dwelling (litres) | Wastewater generated by 60 dwellings (litres) | Disposal rate (litres/ m2) | Area required for disposal area ($m^2$) |
|---|---|---|---|---|---|
| 220 | 6 | 1320 | 79,200 | 3 | 26,400 |

There is sufficient area available onsite for the estimated 26,400m2 disposal area. Additional area is available to be utilised for waste disposal if dwellings have more than 4 bedrooms.

Wastewater treatment and disposal can be constructed as a centralised system, in clusters and / or an individual dwelling basis. This will not increase or decrease the disposal area required. Should the total discharge from any one wastewater discharge exceed 2000 litres then a resource consent will be required from Northland Regional Council for that discharge.

## Stormwater

The proposed development area drains into the Waiaua Stream and its tributaries. Several portions of this area are mapped within the 10, 50, and 100-year regionwide flood zones. However, there are no buildings located within the mapped flood zones downstream of the site.

Effective runoff management is crucial to ensure that runoff from impervious surfaces is properly dispersed, thereby preventing downstream nuisance. This strategy will help regulate water flow and minimize the potential for negative environmental impacts in the surrounding area.

Additionally, because the development area is situated on the coast, extensive stormwater attenuation is not considered likely to be necessary for this development. Natural drainage patterns may suffice to manage stormwater without the need for extensive attenuation measures. Impermeable surface coverage for the Golf Living sub zone is not limited in the District Plan.

## Potable Water

An estimate of the required daily potable water required can be based on the wastewater generation. It is estimated that each dwelling will consume 1320 litres of water per day. The total water consumed by 60 dwellings is calculated to be 79,200 litres. This alone exceeds the current consented water take from the well at the lodge of 60,000 litres per day.

Potential options for potable water supply are a new consented well, roof tank collection, connection to the new 14 ha reservoir currently under construction or roof tank collection supplemented by the existing consent supply. Storage tanks can be buried to maintain visual amenity.

## Firefighting water supply

Council Engineering Standards require a water supply that is adequate for firefighting purposes. Where there is no reticulated water supply, then each residential dwelling will be responsible for providing adequate on-site firefighting supply.

For a single-family home without a sprinkler system in a non-reticulated supply area, the New Zealand Fire Service (NZFS) Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008 recommends a minimum firefighting water storage capacity of 45 m3 within 90 m of the dwelling, fitted with an adequate means for extracting the water from the tank.

If the water bore is desired for use as a firefighting supply, it would generally need to provide 1500 Litres of water per minute (in line with a reticulated water supply), with electrical and back up diesel pumps, along with the appropriate fittings under discussion with the NZFS National Commander's representative.

The Code (SNZ PAS 4509:2008) specifically allows for alternative methods to be used in meeting the Code requirements, as long as there is approval from an appropriate person nominated by the NZFS National Commander.

### New Matauri Bay Road Vehicle Crossing

The location from where sight stopping distances were measured is shown in the figure below. This was the location where the maximum possible sight stopping distances could be achieved. Mobile Roads classifies Matauri Bay Road as a secondary collector road.


**Figure 3 - Sight stopping distance assessment location Matauri Bay Road**

**Figure 4 - Visibility north of the assessed location.**

**Figure 5 - Visibility south of the assessed location.**

The sight stopping distances achieved are shown in the table below.

**Table 4 - Sight stopping distances.**

| Approach direction | Posted Speed | Estimated 85th percentile operating speed | Aust. Roads Stopping Distance | Sight Distance Achieved |
|---|---|---|---|---|
| North | 80 km/h | 100 km/h | 170m | 170m |
| South | 80 km/h | 100 km/h | 170m | 285m |

This preliminary assessment of sight stopping distances indicates that sufficient distances can be achieved at the location where assessed.

It is likely that the vehicle crossing will be required to be constructed as per NZTA Diagram E.

It is recommended that a specific traffic impact assessment is undertaken to confirm the above.

## Upgrade of Existing Tepene Tablelands Road Vehicle Crossing

The location from where sight stopping distances were measured is shown in the figure below.

Te Pene Tablelands Road is not sealed and has a formed width of 6m. Mobile roads estimates daily traffic to be 107 VPD.


**Figure 6 - Sight stopping distance assessment location Tepene Tablelands Road**

**Table 5 - Sight stopping distances.**

| Approach direction | Posted Speed | Estimated 85th percentile operating speed | Aust. Roads Stopping Distance | Sight Distance Achieved |
|---|---|---|---|---|
| Northwest | 60 km/h | 60 km/h | 102m | 185+m |
| Southeast | 60 km/h | 60 km/h | 102m | 114m |

The 85th percentile operating speed was estimated by drive through. This preliminary assessment of sight stopping distances indicates that sufficient distances can be achieved at the location where assessed.

It is likely that the vehicle crossing will be required to be constructed as per FNDC Engineering Standards Type 2 Rural Crossing.

It is recommended that a specific traffic impact assessment is undertaken to confirm the above.

## Access

Under Rule 18.7.6B.1 the Kauri Cliffs Golf Living Sub-Zones is exempt from the transport rules contained in Chapter 15.1 of the Far North District Plan. We recommend constructing the main accessway to a minimum 5.5m width either sealed or unsealed rural road as per sheet 3 of the FNDC Engineering Standards version 0.6. This is the minimum

required by the Engineering Standards and the final access can be designed to fit the premium nature of the proposed development.

The proposed accessway between Matauri Bay Road and the proposed bridge crossing goes through an area with cross slopes of 18-20˚. Geotechnical advice should be sought on the suitability of this slope for the accessway, in particular with regard to any excavation that will be required to enable the required carriageway width.

A bridge is included in the development concept and masterplan linking the northern cluster to the southern cluster. There is likely to be elevation difference between the two sides of the proposed bridge. Typically, the maximum slope of a bridge deck is between 8H:1V and 12H:1V. However, as road access is proposed for both ends of the development a bridge is not critical to the development. Should a bridge be constructed further investigation including an alignment of the accessway across the area with the with cross slopes of 18-20˚ is required to determine the alignment of the proposed bridge. If there is not a bridge then the assessment of crossings and internal roading may change.

## Limitations

This letter has been prepared for the sole use of our client, Waiaua Bay Farm Limited, for the particular brief and on the terms and conditions agreed with our client. It may not be used or relied on (in whole or part) by anyone else, or for any other purpose or in any other contexts, without our prior written agreement. This report may not be read or reproduced except in its entirety.

Prepared by:

**Joshua Cuming**

Environmental Geologist
BSc (Geology & Env. Stu.)
CEnvP

Reviewed and approved by:

pp

**John Papesch**

Senior Civil Engineer
BE (Civil Engineering),
CPEng, CMEngNZ