BEFORE THE INDEPENDENT HEARINGS PANEL

UNDER the Resource Management Act 1991 (RMA)

IN THE MATTER of the Far North Proposed District Plan - Hearing 15D: Rezoning Kerikeri-Waipapa

STATEMENT OF EVIDENCE OF TREFFERY BARNETT ON BEHALF OF KIWI FRESH ORANGE COMPANY LIMITED ECOLOGY 16 June 2025

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INTRODUCTION

- 1 My full name is Treffery Jean Barnett.
- 2 I have been asked by Kiwi Fresh Orange Company Limited (KFO) to provide independent expert advice on the Proposed Far North District Plan (FNPDP).
- 3 This evidence relates to KFO's submission on Hearing 15: Rezoning Kerikeri-Waipapa. KFO owns 197 ha of land between Kerikeri and Waipapa (Site), which is proposed to be zoned for Rural Production. KFO's submission seeks a live urban zoning of the Site, comprising a mix of general residential, mixed urban and natural open space.
- 4 I am the author of the Kerikeri Plan Change High level ecological constraints analysis ecological report for the site and I last visited the site on 28 March 2022.
- 5 In the course of preparing this evidence, I have also reviewed:
 - (a) The Flood Scheme Investigation prepared by e2 Environmental Consulting Civil Engineers attached as Appendix 4(g) to KFO's submission.
 - (b) Draft evidence of Laddie Kuta

QUALIFICATIONS AND EXPERIENCE

6 I am the Technical Director of Freshwater and a Senior Coastal and Freshwater Ecologist at Bioresearches, Consulting Biologists in Auckland which is a subsidiary of Babbage Consultants.

Qualifications and experience

- I have a Bachelor of Science (1983) and Master of Science (Hons) (1985) from the University of Auckland. I am a member of the New Zealand Freshwater Sciences Society, the Ornithological Society of New Zealand, and the Environment Institute of Australia and New Zealand (EIANZ).
- I have practised as a consultant ecologist for the past 30 years. I
 specialise in freshwater and coastal ecology and I have been
 responsible for undertaking and coordinating numerous assessments of

rivers, streams, wetlands, estuaries and coastal environments throughout New Zealand.

- 9 Examples of my experience relevant to this project are:
 - (a) Land development at McLaughlin Road; Karaka North; Kapiti Road, Kapiti; Shelly Bay, Wellington; West Hoe Heights, Orewa; Pakn'Save Warkworth, Waikanae North, Waikanae; and the expansion of Belmont, Brookby, Drury and Smythes Quarries.
 - (b) Private Plan Changes for Halls Farm "Ara Hills"; Warkworth South 'Waimanawa"; Stubbs Farm, Warkworth; Ardmore "Sunfield"; Plan Change 43, McLaughlins Quarry, Plan Change 90 Highbrook and Te Tuhi Point, Taupō.
 - (c) Freshwater and coastal ecological lead for Papakura to Bombay, State Highway 1 improvements; Northland Bridges Project, Kaeo Bridge; Mangawhai Shared Path; Auckland International Airport developments for Taxiway Mike and remote stands.

CODE OF CONDUCT

- 10 Although this is not a hearing before the Environment Court, I record that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and agree to comply with it.
- 11 I confirm that the issues addressed in this brief of evidence are within my area of expertise, except where I state that I have relied on the evidence of other persons. I have not omitted to consider material facts known to me that might alter or detract from the opinions I have expressed.

SCOPE OF EVIDENCE

- 12 The focus of my evidence is to:
 - (a) describe the Ecological Constraints Memorandum that I prepared in relation to the Site, and which was appended to KFO's submission on the FNPDP and informed the structure planning exercise and zoning proposal contained in the KFO submission;
 - (b) update the advice given in the Ecological Constraints Memorandum;

- (c) address the provisions of the NPS Indigenous Biodiversity that was not in play at the time the submission was prepared; and
- (d) consider specific ecology questions council staff asked KFO.
- 13 This evidence is structured as follows:
 - (a) Site and proposal
 - (b) Assessment methodology
 - (c) Habitats
 - (d) Ecology Questions from Council Staff
 - (e) Summary and Conclusions

SUMMARY OF EVIDENCE

- 14 A high-level ecological constraints analysis was prepared for the site in 2022, via desk-top assessments and a site visit.
- 15 The majority of the site is well maintained farmland used for pasture and cropping for animal feed, with exotic shelter belts occasionally present.
- 16 The Kerikeri/Waipekakoura River borders the site to the north and east, and a deep vegetated gully with large rush-dominated wetland plus a raupō wetland is present at the base of a deep gully to the east.
- 17 The vegetation within the gully is a mix of native trees and shrubs, and exotic pest plants. The riparian vegetation adjacent to the river was dominated by totara with a mix of smaller native trees and some exotic trees but lacking generally lacking an understory.
- 18 To the east and north the site was pasture with occasional well-defined straight drains associated with historic farming practices leading to the Kerikeri River. No streams were present.
- 19 Several small areas of wetland or potential wetland were observed within the riparian area of the river, and several small patches of wetland or potential wetland were observed within the pasture in the centre of the site, usually associated with the headwaters of the streams draining east and south-east to the eastern wetland system.
- 20 The central flood path could provide some constraints with regards to potential streams in the pathway and the wetlands. Investigation of the

status of the flood mitigation measures as 'specified infrastructure' is recommended.

- 21 Following a meeting on 24 February 2025 between KFO's planner and legal representative and Far North District Council District Plan team planners, the council staff posed three questions that they sought further clarification on in relation to ecology matters, which related to mud fish in the drains, bat presence and downstream ecological effects of the floodway.
- 22 No surveys were carried out for mudfish, but their presence is highly unlikely on the main site as the drains were mainly shallow, open swale drains, that would completely dry out over summer (i.e. unsuitable habitat); the comprehensive eDNA surveys in the catchment immediately downstream of the site and adjacent catchment did not record mudfish; and all database mudfish records in the wider area were from wetlands, not drains.
- 23 The nearest bat records are 11 km from the site with bats predominantly associated with the Puketi Forest. If a bat survey should be required this could occur in relation to future resource consent applications.
- 24 The floodway is proposed to be within the alignment of the current overland flood path and if the design of the outlet of the floodway is responsive to the potential effects (i.e. temporary increases in velocity and volume), then the overall level of effect of the floodway on downstream aquatic habitats should be Low, with only a minor shift from existing baseline conditions. In any event these matters would be secured as standard conditions on future resource consent applications and there are design restrictions that would mean there were likely to be effects that would mean rezoning, as sought, was not appropriate.
- 25 Planting of the edges, outlet area and riparian areas of the floodway with indigenous vegetation would have multiple benefits to both aquatic habitats and to terrestrial fauna, through buffering, shade, habitat provision and connectivity through the site, and would result in an overall Net Gain in biodiversity though the area of the floodway.

SITE AND THE PROPOSAL

- In this statement of evidence, I do not repeat the description of the live urban zoning of the Site which is set out in detail in the evidence
 Burnette O'Connor on behalf of the Applicant.
- I prepared the High-level Ecological Constraints Analysis dated 26
 April 2022. Although it was prepared with a private plan change in mind, its analysis and conclusions stand for a submission on the FNPDP.
- 28 The High-level Ecological Constraints Analysis is enclosed as **Annexure A** to this evidence.

ASSESSMENT METHODOLGY

- 29 In order to determine the extent of the freshwater habitats on site, assess their ecological values, and potential ecological constraints, the ecological assessments were carried out by:
 - (a) Desktop assessments, carried out prior to and after the site assessments; and
 - (b) On-site ecological assessments.
- 30 Desk top assessment involved review of the Northland Regional Council WebMap Biodiversity overlays; NZMS Topo Maps; current and historical aerial imagery (Google Earth, Retrolense, NearMaps, Grip); Department of Conservation Bioweb records for bats; Wilderlab eDNA database and the NZ Freshwater Fish Data Base.
- 31 On-site ecological assessments were targeted to potential freshwater and terrestrial constraints identified from the desk top analysis, with the remainder the site assessed via desktop.
- 32 On site ecological assessment were carried out on 22 March 2022. A walkover of the site, potential watercourses and aquatic habitats, was undertaken during the site visit. Photographs were taken and notes were made on the extent of the terrestrial and aquatic habitats and their ecological quality, including species, vegetation types, riparian cover and habitat-limiting factors.
- 33 During the site assessment, the presence and extent of water was noted, reference photos were taken, and freshwater habitats were marked using a handheld GPS unit. Watercourses were classified under

the under the criteria of the Northland Regional Plan (NRP) to determine, in accordance with the definitions in the plan, the ephemeral, intermittent or permanent status of these watercourses. In addition, these water-courses were assessed as to whether they were natural or artificial, in accordance with the NRP.

34 Potential wetland areas were assessed following the Ministry for the Environment's (MfE) wetland de-lineation protocols (MfE, 2021), to ascertain if the area presented with the physical characteristics to be considered a Natural Inland Wetland, and assessed against the definitions under Natural Wetland in the NRP.

HABITATS

- 35 The freshwater habitats were comprised of farm drains, ponds, streams, the Kerikeri / Waipekakoura River, Puketotara Stream and natural wetlands.
- 36 The Puketotara Stream flows along the southern boundary of the Kerikeri Golf Course. No other streams were observed in the Golf Course site outside of the 20m esplanade yard of the stream. Several constructed ponds are present on the site but as such would not meet the definition of a natural inland wetland as they would meet exclusion (c)¹ within the NPS-FM definition .
- 37 To the land immediately adjacent to the northern boundary of the golf course was pasture with some cropping. This block was accessed from State Highway 10 from near the southern block boundary which allowed the vegetated gully system in the centre of the eastern boundary to be observed (from the south). No streams or wetlands were observed on the route into the property but streams and wetlands were observed within the vegetated gully system. A large rush dominated wetland was present in the gully floor near Kerikeri River, a large raupō wetland was observed in the upper gully and patches of steam habitats interspersed

¹ (c) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body;

with wetland were observed from the upper gully system to the river (Figure 1).



Figure 1. Freshwater habitats within the Kerikeri Plan Change Area (dark blue - rivers / streams; blue - ponds; light blue – assumed streams; green – natural wetlands; yellow – farm drains.

- 38 At the top of the gully the vegetation was dominated by mature kahikatea (*Dacrycarpus dacrydioides*), with transitioned to tōtara (*Podocarpus totara*) and exotic pines. At the time of the site visit the banks of the gully had been recently sprayed for gorse and the remaining vegetation was a mix of tōtara, kahikatea, ponga (Cyathea dealbata), and other smaller native shrubs mixed with eucalyptus, wattle (*Paraserianthes lophantha*), pine (Pinus spp.) and woolly nightshade (*Solanum mauritianum*).
- 39 In the western part of the site, north and west of the wetland gully, most of the land is pasture or rotationally used for cropping. Streams or wetlands habitat was observed about 1270m east of the SH 10 gate, with the headwaters of a likely stream observed draining towards the eastern gully system, and at 1500m east of the gate a small wetland was present north of the access track with an incised stream

downstream of the culvert outlet under the access track, as shown in Figure 2.

40 To the east and north the site was pasture with occasional well-defined straight drains leading to the Kerikeri River. No streams were present. The riparian vegetation near the river was dominated by tōtara, with māpou (*Myrsine australis*), kūmarahou (*Pomaderris kumeraho*), cabbage tree (*Cordyline australis*), karamū (*Coprosma robusta*) and kānuka (*Kunzea robusta*) patchily common. The understory was generally depauperate, comprised of pasture grass.



Figure 2. Putative stream and classified stream draining south-east towards top of vegetated gully.

Several patches of potential wetland habitat were present (marked in red in Figure 3) and one area of 'natural wetland' (marked in green in Figure 6). All three of these habitats should be delineated in accordance with the Ministry of Environment recommended methodologies to confirm their status as natural wetlands or not wetlands.



Figure 3. Northern corner of the site, illustrating position of farm drains, wetland, and two putative wetlands.

- 42 My main conclusions from the constraint's assessment were:
 - (a) Preliminary assessment of the Golf Course indicated few ecological constraints. The area contains some patches of native vegetation and large specimen trees, which could provide constraints (manageable through mitigation of effects) for native fauna and constructed ponds (some of which have formed wetland characteristics).
 - (b) The majority of the farmland is well maintained, and used for both pasture and cropping for animal feed. Farm drainage channels were present throughout and some of these could be assessed as modified natural streams.
 - (c) The gully between the golf course and the farm has well established native vegetation and 'natural wetlands' and is therefore subject to the NES-F regulations regarding wetlands.
 - (d) The central flood path could provide some constraints with regards to potential streams in the pathway and the wetlands.
 Investigation of the status of the flood mitigation measures as

'specified infrastructure' should be assessed when the detailed design and future resource consents are sought.

- (e) A 20m esplanade reserve will likely be required upon subdivision of the site in the future. This will protect most the existing riparian vegetation but there are several areas, particularly in the northern corner where this would need to be wider to include all of the established native riparian vegetation.
- 43 The scope of the assessment was high-level, and while no formal fauna or threatened species surveys were undertaken, the available information provides a reasonable understanding of the likely ecological values of the vegetation and the habitats it may support (e.g. land snails, reptiles, birds). Consequently, while some uncertainty remains, this can be resolved through detailed design and consenting.
- 44 The National Policy Statement for Indigenous Biodiversity (NPS-IB, 2023) provides direction to councils to protect, maintain and restore indigenous biodiversity in the terrestrial environment², requiring at least no further reduction nationally. It is relevant to the proposal because the site is within the terrestrial environment, and it contains indigenous biodiversity as defined in Section 1.6 (Interpretation) of the NPS-IB.
- 45 Appendix I of the NPS-IB identifies four criteria for assessing an area as an SNA, being representativeness; diversity and pattern; rarity and distinctiveness; and ecological context (Appendix 1.1, NPS-IB). An SNA is considered to qualify where by any one of these attributes is considered to be met.
- 46 A full assessment against these SNA criteria was not undertaken for the purpose of the constraint's assessment (which preceded the NPS-IB), but the bar for qualifying as an SNA is very low, and includes commonplace, degraded or regenerating indigenous vegetation, such as the riparian areas of the Kerikeri River. The Site will need to be groundtruthed and considered against the SNA criteria, and if it meets the criteria, mapped as part of any planning response. This information can be provided through the consenting process.

² Note – the NPS-IB only covers the terrestrial environment, not wetlands, streams or other aquatic habitats.

- 47 The NPS-IB recognises tangata whenua as kaitiaki of, and partners, in the management of indigenous biodiversity (NPSIB, Policy 2). At the time of preparation of this evidence, no acknowledged taonga species have been identified with respect to this project or are currently listed in the public domain.
- 48 Northland Regional Council Maps has a Northland Biodiversity Ranking over the Kerikeri River riparian area (and the wetland area) for 'Ecosystem Rarity' and for 'Terrestrial Top 30 Sites'. Although indigenous vegetation is present along the much of the riparian margin of the Kerikeri River, the quality is not high, due to stock access, lack of shrub layers and lack of ground cover and pest plants.

ECOLOGY QUESTIONS FROM COUNCIL STAFF

49 I have been informed that KFO is working with the Council to address any issues between them. As of the date of this evidence, I am told the Council has not raised any general concerns regarding my High-level Ecological Constraints Analysis. However, it has posed three specific questions, which I will address below.

Have drains been considered for mudfish?

- 50 No formal assessments for mudfish have been carried out. The drains were predominantly open pasture swale drains that would completely dry out during summer. As such, they would not provide the moist, sheltered conditions required to support aestivating mudfish, which depend on persistent damp microhabitats to survive dry periods.
- 51 A search of the NZFFDB returned just over 200 records of mudfish (many identical) in the Kerikeri River catchments (Catchments Number 035 Kerikeri River, Puketotara Stream, Waipekakoura Stream) between 1993 and 2022. All records were from the wetlands/swamps around the airport, none were in the vicinity of the area proposed for re-zoning, and no records cited drains.
- 52 Searches of the catchments north of the Kerikeri River catchment (Catchment 034, Rangitane River, Waipapa Stream) returned no records. Searches of the catchments south of the Kerikeri River catchment (Catchment 036, Kerikeri Inlet to Waitangi River) returned

> numerous records in the Waitangi Wetlands and adjacent wetlands in the catchment. There were no records in drains. (Refer Figure 4).



Figure 4. NZFFDB records of mudfish (purple dots) in the Kerikeri Catchment and the catchments north and south of the Kerikeri Catchment.

- 53 The Wilderlab eDNA records show three gold standard 6-replicated samples were collected in the Kerikeri Catchments (Figure 5). No mudfish eDNA was recorded in any of the eighteen samples.
- 54 It is highly unlikely that mudfish are present in the drains on the site.



Figure 5. Location of Wilderlab Gold standard 6-replicate sampling sites in the Kerikeri catchments (Snip from Wilderlab Explore https://wilderlab.co/explore)

Has the presence of bats been considered?

- 55 No formal survey for bats has been carried out and no survey should be carried out until later in the year or the summer months when the conditions for bat surveying can be met. Our search of the Department of Conservation Bioweb bat records show the closest bat records are approximately 11 km from the site. Within 25km of the site, both long-tailed and short-tailed bats are detected, predominantly within the Puketi Forest, though there is a cluster of records to the south (approximately 15km) in Ngawha and one record to the north off Takou Bay Road. (Refer Figure 6).
- 56 A lack of local survey effort for bats means that the possibility of bat presence within the site cannot be discounted. Bats are highly mobile with large home ranges, and a distance of 11 km to the nearest bat records further increases the possibility that bats may utilise the site. Riparian corridors, particularly those with mature trees, such as the Kerikeri River corridor, are commonly used by bats for commuting and foraging, and it is also possible that the mature tree on site are used for roosting.

57 It would be appropriate to survey for bats at the time for future resource consent applications, but as developments can be designed to minimise adverse effects on bats, there are no ecology reasons with respect to bat habitat, or future bat habitat to reject the zoning submission.



Figure 6. Bat records within 25km of the property boundary.

Are there any potential downstream ecological effects of the floodway?

58 The floodway to manage the flood hazard will generally follow the alignment of the existing overland flood flow path from State Highway 10. It is proposed to be constructed to achieve a naturalised outcome that can also be used for amenity purposes (pedestrian and cycle connectivity); and to provide a green corridor through the site.

- I have read the e2 Environmental report on the Flood Scheme
 Investigation³ and generally agree with the ecological components of the
 design (e2 Environmental (2022) Section 5.3), i.e.
 - (a) Low flow channel for local drainage and low flows;
 - (b) Vegetation areas; and
 - (c) Velocity controls and scour and erosion protection at points where a risk is identified.
- 60 Although detailed designs are not available the main effects of the floodway are identified as:
 - (a) Loss or modification of current habitats
 - (b) Potential for periodic increase in volume and velocity of water in the downstream aquatic habitats, including wetlands
 - (c) Death or injury to native fauna.
- 61 These effects are assessed in accordance with the Ecological Impact Assessment (EcIA) EIANZ guidelines (Roper-Lindsay et al, 2018). The EcIA Guidelines provide a standardised matrix framework that allows ecological effects assessments to be clear, transparent and consistent. This framework is generally used in ecological impact assessments in New Zealand as good practice. The Guidelines provide a three-step process for undertaking ecological assessments which requires a. Assess the value of the area / habitats; b. Determine the magnitude of effect on those values / habitats; and c. Evaluate the overall severity or level of effect using a matrix of the ecological value and magnitude of effect (Table 1).

³ E2 Environmental Consulting Civil Engineers (2022) Kerikeri Subdivision & Flood Scheme Investigation and Proof-of-Concept Design. Kerikeri, Northland. Report for Kiwi Fresh Orange Company Limited Dated 10 October 2022. 48pp.

Table 1.	Criteria matrix for	describing level	of effects	(Roper-Lyndsay
et al. 201	8).			

Ecological Value → Magnitude ↓	Very High	High	Moderate	Low	Negligible
Very High	Very High	Very High	High	Moderate	Low
High	Very High	Very High	Moderate	Low	Very Low
Moderate	High	High	Moderate	Low	Very Low
Low	Moderate	Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low	Very Low
Positive	Net gain	Net gain	Net gain	Net gain	Net gain

- 62 My assessment of ecological effects is high-level, reflecting the nature of the rezoning request in the PDP submission. While ecological constraints were considered in 2022, detailed fauna surveys have not yet been undertaken.
- 63 The loss and modification of current habitats is assessed as a Low magnitude of effect (i.e. a minor change to the existing baseline) of Low value habitats (pasture, cropping land and hedge row trees), which is an overall Very Low level of effect. If streams or wetlands are present within the alignment, then the ecological value of the habitats are likely to be Low (based on the values of the habitats observed on site), with the magnitude of effects is likely to be moderate but temporary, as the floodway will be designed, in part, for aquatic habitats. This will result in a Low level of effect. Once the detailed design is available at resource consent stage, a more comprehensive ecological assessment is recommended to ensure that and habitats are more comprehensively assessed and the ecological effects on habitats are appropriately managed.
- 64 Planting of the edges, outlet area and riparian areas of the floodway with indigenous vegetation would have multiple benefits to both aquatic habitats and to terrestrial fauna, through buffering, shade, habitat provision and connectivity through the site, and would result in a overall **Net Gain** in biodiversity though the area of the floodway.
- 65 Temporary increases in velocity and/or volume on the downstream aquatic habitats forms part of the current environment, as the floodway follows the current overland and flood flow path. Provided the velocity of

> the water thought the constructed floodway is attenuated through design (e.g. the proposed vertical drops) and the downstream extent is specifically designed to reduce both velocity and prevent erosion and scour, then the magnitude of effect should be Low. The ecological value of the downstream aquatic habitats is likely to be a minimum of Moderate, but possibly High. If the design of the outlet of the floodway is responsive to the potential effects (as outlined above), then the overall level of effect of the floodway on downstream aquatic habitats should be **Low**.

66 The risk of adverse effects to native fauna at this site, through the areas of the floodway is assessed as Low, as the overland flood flow path is part of the current environment. The construction of the floodway will result in the loss of established hedgerow trees, which are likely to support native birds during the breeding season. Adverse effects on native birds through the floodway alignment can be minimised by avoiding felling trees during the breeding season (generally September to January) or managing the felling with nest checks and management. Native fish potentially present in aquatic habitats within the floodway alignment can be managed through a native fish recovery and relocation. Native lizards, may be present and can be managed through the implementation of a Lizard Management Plan. Potential effects on native fauna can be managed through site surveys and a site-specific Ecological Management Plan.

SUMMARY AND CONCLUSION

67 Based on my High-level ecological constraint's analysis and review of the ecological features in light of the updated NPS-IB (October 2024) there is nothing from an ecological perspective that suggests the site is not suitable for an urban zone. The majority of the site is currently farmed / cropped; there are existing legislative protections of the riparian area of the Kerikeri / Waipekakoura River upon subdivision (with the Esplanade Reserve requirements); natural inland wetlands have protection under the National Environmental Standards for Freshwater (NES-F); most native fauna are protected under the Wildlife Act; and effects on native fauna can be managed through an Ecological Management Plan (or equivalent). Typically resource consents for any future development require further ecological assessments, including

assessments of the effects of the proposed development under the effects management hierarchy on the habitats, flora and fauna on the site.

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Treffery Barnett

16 June 2025