

Appendix 1: Table of Submission and Further Submission Points with Recommended Decisions and s42A report references.

Table of Submission Points – Reference to s42a Report

This table provides a complete record of recommendations in relation to all submission points. Additionally, it directs submitters' to the topic heading of the s42a report where their submission point has been evaluated. In some instances, a submission point is relevant to more than one s42a topic. In this case, the table references the point in the s42a report where the most substantive assessment is provided.

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/01	04/01.01	Sue-Ann Russell	-	Oppose	Opposed to the plan change due to limited information on stormwater treatment and potential impact on Lake Horowhenua.	More information on three waters proposal.	Reject	Infrastructure
04/02	04/02.01	Hayden & Prudence Stewart	-	Oppose	Seeks removal of the local road shown on Structure Plan alongside 180 Gladstone Road (submitter's property) as they do not intend to sell and do not wish to have a road on their property.	Remove local road on submitter's property.	Reject	Well Functioning Urban Environment
04/03	04/03.01	James Peter Cameron	-	Support in part	Supports plan change, but seeks inclusion of a bird corridor.	Include requirement for planting of native trees to establish native bird and butterfly habitats and pathways.	Reject	Natural Environment and Sustainability Matters
04/04	04/04.01	Simon Austin	-	Oppose	Opposes plan change on basis that it does	Include land north of Queen Street.	Reject	Whole Plan Change and

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					not include land north of Queen Street.			General Matters
04/04	04/04.02	Simon Austin	-	Oppose	Location of development means O2NL will bisect Levin.	Unclear - submission states that the development should not mean O2NL expressway bisects Levin.	Reject	O2NL Impact, Interface, and Timing
04/04	04/04.03	Simon Austin	-	Oppose	States 2m front yard setback is not good urban design.	Increase front yard setback.	Reject	Urban Form, Character, and Amenity
04/05	04/05.01	Erin Nijhuis	-	Neutral	Insufficient information to understand the impact of O2NL and the proposed Liverpool Street extension on the submitter's property.	Provide further information about the detailed design of O2NL and the proposed Liverpool Street extension (and associated process - e.g. PWA).	Accept in part	O2NL Impact, Interface, and Timing
04/06	04/06.01	Elisabeth Leighfield	-	Oppose	Oppose road connections onto Gladstone Road and road through centre of development due to traffic concerns.	Remove road connections onto Gladstone Road and introduce additional measures to encourage recreational activities on Gladstone Road, as a means of traffic calming.	Reject	Well Functioning Urban Environment

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04/06	04/06.02	Elisabeth Leighfield	-	Support	Supports requirements for rainwater tank, but seeks requirements for tanks to be increased.	Retain requirement for rainwater tanks and require larger lots (e.g. Greenbelt Residential) to have onsite water supply.	Accept in part	Infrastructure
04/06	04/06.03	Elisabeth Leighfield	-	Oppose	Insufficient information to understand Council's ability to supply reticulated services in a sustainable, reliable manner and the associated costs.	More information on three waters proposal.	Reject	Infrastructure
04/06	04/06.04	Elisabeth Leighfield	-	Support in part	Supports the concept that vehicles should not cross strategic cycleways, but opposes use of rear access lanes due to CPTED concerns.	Include advice on how to design rear access lanes in accordance with CPTED principles and differentiate between local roads and laneways.	Reject	Transport
04/06	04/06.05	Elisabeth Leighfield	-	Oppose	Opposes the generality of activities proposed to be able to establish in commercial zone.	Prohibit liquor stores in Taraika.	Reject	Non-RMA Matters
04/07	04/07.01	Geoff Kane	-	Support in part	Supports plan change, so long as Land Use Capability	Protection of LUC 1 and 2 soils.	Reject	Natural Environment and

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					(LUC) 1 & 2 soils are not subdivided.			Sustainability Matters
04/07	04/07.02	Geoff Kane	-	Support in part	Supports plan change so long as stormwater is managed to avoid additional runoff into Koputaroa Stream or under the new expressway into existing drains.	Effective stormwater management.	Accept in part	Infrastructure
04/08	04/08.01	Ann Thomas	-	Support in part	Provide reticulated waste water to Greenbelt Residential Area so additional development can occur	Allow additional density in Greenbelt Residential areas	Accept in part	Well Functioning Urban Environment
04/09	04/09.01	Phillipa & Pasanka Wickremasinghe	-	Support in part	Make better use of land by allowing greater housing density in certain areas. This reduces pressure on productive land and allows more housing to be built, addressing housing shortage.	Up-zone Greenbelt Residential and Low Density Residential to Standard Residential	Accept in part	Well Functioning Urban Environment

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04/09	04/09.02	Phillipa & Pasanka Wickremasinghe	-	Support in part	Strategic cycleway is a great initiative for health and low emission transport, but should be relocated to the collector road, as this would likely allow it to be built earlier.	Relocate Strategic Cycleway to Collector Road	Accept in part	Transport
04/10	04/10.01	Helen Olive Brown & Kevin Shane MacPherson	-	Support in part	Make better use of land by allowing greater housing density in certain areas. This reduces pressure on productive land and allows more housing to be built, Improving alignment with National Policy Statement for Urban Development (NPS-UD) and Proposed National Policy Statement on Highly Productive Land (PNPS-HPL) and future proofs against future growth	Up-zone Greenbelt Residential and Low Density Residential to Standard Residential	Accept in part	Well Functioning Urban Environment

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04/11	04/11.01	John William Brown & Jeny Doreen Brown	-	Support in part	Make better use of land by allowing greater housing density in certain areas. This reduces pressure on productive land and allows more housing to be built, Improving alignment with NPS-UD and PNPS-HPL. Allows more efficient/cost-effective infrastructure and provides improved economic viability.	Up-zone submitter's land to Standard Residential.	Accept in part	Well Functioning Urban Environment
04/11	04/11.02	John William Brown & Jeny Doreen Brown	-	Support in part	Supports use of strategic cycleways, but suggests relocating to collector road.	Relocate Strategic Cycleway to Collector Road.	Accept in part	Transport
04/12	04/12.01	Gwyneth Schibli	-	Support in part	Supports use of cycleways, but seeks that they are constructed in a timely manner and not reliant on development occurring. Modifications to	Modify location to follow fixed north/south and east/west roads. Smooth dog leg near Waiopehu Reserve.	Accept in part	Transport

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					route suggested so that it follows fixed roads (North/South and East/West) and eliminate 'dog leg' near Waiopehu Reserve.			
04/13	04/13.01	Gwyneth Schibli	-	Support in part	Seeks that planning is done on the basis of the population doubling over the next 20 years. Raises concerns about water availability in Ōhau River to support this growth. Supports requirement for rainwater tanks and suggests investigating alternate water sources, such as known bores.	Abandon the wetland approach to managing stormwater and instead require use of sumps for house lots and north/south swales.	Reject	Infrastructure
04/14	04/14.01	Gwyneth Schibli	-	Support in part	Notes pressure on land availability from population growth. Important role for Horowhenua as a food producer. Need to contain growth and maximise land usage, to avoid	Up-zone Greenbelt Residential and Low Density Residential to Standard Residential.	Accept in part	Well Functioning Urban Environment

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					sprawl. Already have too many lifestyle blocks.			
04/15	04/15.01	Gwyneth Schibli	-	Oppose	Water runs through the submitter's property west of Arapaepae Road during heavy rain. The proposed wetlands will not be sufficient for denser housing. Need specifically designed sumps and swales. Oppose to use of wetlands.	Replace wetland proposal with sumps and swales.	Reject	Infrastructure
04/16	04/16.01	Carol & Rob Bloomfield	-	Support in part	Zoning should be consistent for entire properties.	Change zoning on submitter's property to be consistent across whole property.	Accept in part	Well Functioning Urban Environment
04/16	04/16.02	Carol & Rob Bloomfield	-	Support in part	Roads and cycleways should follow ownership boundaries.	Relocate roads and cycleways to follow ownership boundaries.	Accept in part	Transport
04/16	04/16.03	Carol & Rob Bloomfield	-	Support in part	Open space needs to be designed so as not to impact on views to ranges (e.g. from large planting).	Protect views of ranges when designing reserves.	Reject	Well Functioning Urban Environment

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04/17	04/17.01	Ministry of Education	Objective 6A.1	Support in part	Supports intent of policy, but seeks that reference to 'social infrastructure' be included to cover education facilities.	Include 'social infrastructure' to Objective 6A.1.	Accept	Minor drafting edits
04/17	04/17.02	Ministry of Education	Policy 6A.1.4	Support	Supports policy reference to education facilities.	Retain as proposed.	Accept in part	Well Functioning Urban Environment
04/17	04/17.03	Ministry of Education	Policy 6A.1.5	Support	Supports reference to walking and cycling, given children in Taraika may walk or cycle to school.	Retain as proposed.	Accept in part	Well Functioning Urban Environment
04/17	04/17.04	Ministry of Education	Policy 6A.6.3	Support in part	Supports intent of policy in enabling education, however states that wording about limits on the scale of education activities is unclear and creates uncertainty.	Remove reference to 'limits on scale' and consider introducing education activities as a permitted activity with limits on scale, noting that the Ministry will likely rely on the designation process.	Accept in part	Well Functioning Urban Environment
04/17	04/17.05	Ministry of Education	-	Support in part	Further refinement of the rule framework to enable education facilities.	Further refinement of the rule framework to enable education facilities.	Accept in part	Well Functioning Urban Environment

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04/18	04/18.01	Jennings Family Trust	-	Oppose	Oppose the location of the arterial road running from Queen Street E to the centre of Tara-Ika due to proximity to Redwood Grove.	Move road further east.	Reject	Well Functioning Urban Environment
04/18	04/18.02	Jennings Family Trust	-	Oppose	Oppose the location of the greenspace and education site, these should be located to create a buffer between Redwood Grove.	Introduce a greenspace buffer around Redwood Grove, or require low volume roading connectivity to the rear of eastern Redwood Grove to provide for future connectivity/subdivision.	Reject	Well Functioning Urban Environment
04/18	04/18.03	Jennings Family Trust	-	Oppose	Oppose the residential zoning between SH57 and the O2NL corridor - medium density, green space, or commercial would be more suitable.	Change zoning to medium density, commercial zoning, or green space.	Accept in part	Well Functioning Urban Environment
04/18	04/18.04	Jennings Family Trust	-	Oppose	Opposes the zoning in the southwest corner. This should be medium or standard density.	Change zoning to medium or standard density.	Accept in part	Well Functioning Urban Environment

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04/18	04/18.05	Jennings Family Trust	-	Oppose	Oppose the low density residential zoning at Tararua Road, near SH57.	Change zoning to medium density or mixed use zoning.	Accept in part	Well Functioning Urban Environment
04/19	04/19.01	Michael Harland	-	Oppose	Oppose Plan Change in its entirety, as the land should be used for food production given nature of the land and distance from Lake Horowhenua.	Reject Plan Change in its entirety.	Reject	Whole Plan Change and General Matters
04/19	04/19.02	Michael Harland	-	Oppose	Oppose due to the potential impact of O2NL. Taraika will mean Levin still straddles a State Highway, resulting in effects such as noise, light, and air pollution.	Reject Plan Change in its entirety.	Reject	O2NL Impact, Interface, and Timing
04/19	04/19.03	Michael Harland	-	Oppose	Oppose due to insufficient water supply to meet current needs.	Reject Plan Change in its entirety.	Reject	Infrastructure
04/19	04/19.04	Michael Harland	-	Oppose	Oppose due to lack of health services. Adding more residents is unfair to	Reject Plan Change in its entirety.	Reject	Whole Plan Change and General Matters

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					those who already live here.			
04/19	04/19.05	Michael Harland	-	Oppose	Considers the consultation process a 'rubber stamping' exercise and not genuine due to ground breaking ceremony attended by the Prime Minister.	Reject Plan Change in its entirety.	Reject	Whole Plan Change and General Matters
04/19	04/19.06	Michael Harland	-	Oppose	Proposal will continue to pollute Lake Horowhenua.	Reject Plan Change in its entirety.	Reject	Infrastructure
04/20	04/20.01	Julia Burgess	-	Oppose	Opposes current low density zoning, supports a change to standard density zoning.	Change low density zoning to standard density.	Accept in part	Well Functioning Urban Environment
04/21	04/21.01	Fire and Emergency New Zealand	-	Support in part	Notes that all properties (both reticulated and non-reticulated) need suitable firefighting water supplies.	Introduce provisions requiring subdivisions to ensure 'firefighting water supply', and for buildings to have a firefighting supply in accordance with the NZ Firefighting Code of Practice SNZ/PAS 4509:2008.	Accept in part	Infrastructure

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04/21	04/21.02	Fire and Emergency New Zealand	-	Support in part	Supports the proposed road carriageway widths, as these are suitable for fire trucks to access properties.	Retain as proposed.	Accept	Transport
04/21	04/21.03	Fire and Emergency New Zealand	-	Support in part	Supports approach to managing risk from natural hazards.	Retain as proposed.	Accept in part	Natural Environment and Sustainability Matters
04/21	04/21.04	Fire and Emergency New Zealand	-	Support in part	Supports development of a stormwater management solution capable of dealing with firefighting flows.	Ensure stormwater solution is capable of managing stormwater without causing adverse effects on the receiving environment.	Reject	Infrastructure
04/22	04/22.01	Gill Morgan	-	Oppose	Submission states that consultation process was not inclusive enough.	More specific consultation undertaken with landowners who did not participate in the Master Plan process.	Reject	Whole Plan Change and General Matters
04/22	04/22.02	Gill Morgan	-	Oppose	Extent of low density and greenbelt residential land is wasteful and does not cater for the needs of those in	Up-zone Greenbelt Residential and Low Density Residential to Standard Residential.	Accept in part	Well Functioning Urban Environment

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					most need of housing.			
04/22	04/22.03	Gill Morgan	-	Oppose	Cycle network is disconnected and does not provide sufficient connections into Levin.	Improve cycle connectivity to Levin.	Reject	Transport
04/22	04/22.04	Gill Morgan	-	Oppose	Submission questions what protection is proposed for Waiopehu Reserve.	Advise appropriate protections for Waiopehu Reserve.	Reject	Natural Environment and Sustainability Matters
04/22	04/22.05	Gill Morgan	-	Oppose	Insufficient integration evidenced between O2NL and Taraika.	Show evidence of consultation and consideration of how O2NL and Taraika will integrate with each other.	Reject	O2NL Impact, Interface, and Timing
04/23	04/23.01	Kevin Daly	-	Support in part	Extent of low density is a waste of land. Standard density would be a more efficient use of land, would better mirror the proposed development pattern to the east, provide for more housing near key infrastructure (e.g.	Up-zone Low Density Residential to Standard Residential.	Accept in part	Well Functioning Urban Environment

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					collector road and cycle route) and improve the economic viability of constructing said key infrastructure.			
04/23	04/23.02	Kevin Daly	-	Support	Support no restrictions on vehicle crossings into secondary collector roads.	Retain as proposed.	Accept in part	Transport
04/24	04/24.01	Haddon Preston	-	Oppose	The 'street network' terminology contained within the Master Plan document is inconsistent with that used on the Structure Plan.	Address inconsistency.	Reject	Non-RMA Matters
04/24	04/24.02	Haddon Preston	-	Oppose	Protection of cultural sites (e.g. Maunu Wahine and Waihau Waterhole) is referenced as a key design principle in the Master Plan but there is no associated policy or rule in the Proposed Plan Change.	Introduce policy which requires these specific sites to be protected.	Accept in part	Culture and Heritage

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04/24	04/24.03	Haddon Preston	Objective 6A.1	Oppose	Notes that solar access is an important component of good urban design.	Seeks inclusion of "achieves good solar access to buildings" to Objective 6A.1.	Reject	Urban Form, Character, and Amenity
04/24	04/24.04	Haddon Preston	-	Oppose	Notes inconsistency in zoning terminology between planning maps (Low Density Residential) and structure plan (Low Density Area).	Address inconsistency.	Accept	Minor drafting edits
04/24	04/24.05	Haddon Preston	-	Oppose	Extension of medium density area on either side of the primary north south connector road and removal of low density overlay would better align with the proposed policy framework.	Increase extent of medium density overlay and remove low density overlay.	Accept in part	Well Functioning Urban Environment
04/24	04/24.06	Haddon Preston	-	Oppose	Zoning parks and reserves as 'open space' does not allow sufficient flexibility and should not occur until the reserve has been vested, to allow the zone boundaries	Rezone open space areas to residential.	Reject	Well Functioning Urban Environment

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					to be accurately determined.			
04/24	04/24.07	Haddon Preston	-	Oppose	The cost of providing infrastructure to the extent shown on the Structure Plan has a disproportionate effect on smaller landowners and requires them to construct infrastructure over and above what is required for their development. Clarification sought regarding the timing of development funding and how this will be linked with the timing of infrastructure construction.	Ensure developer only has to pay for the infrastructure needed for their own development.	Accept in part	Infrastructure
04/24	04/24.08	Haddon Preston	-	Oppose	Restricted Discretionary Activity status for subdivision is too restrictive and contrary to the NPS-UD.	Make subdivision a permitted or controlled activity, subject to conditions.	Reject	Whole Plan Change and General Matters

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04/24	04/24.09	Haddon Preston	-	Oppose	Remove the rule requiring access via rear access lanes for properties fronting strategic cycleways and amend associated policy to allow more flexibility for creative design.	Remove the rule requiring access via rear access lanes for properties fronting strategic cycleways and amend associated policy to allow more flexibility for creative design.	Reject	Transport
04/25	04/25.01	Horowhenua District Council	-	Support in part	The extent of low density residential zoning on the Tararua Road side of the Plan Change area needs to be reviewed in light of new information about the likely location of an O2NL interchange at Tararua Road and in light of policy direction from the National Policy Statement - Urban Development.	Up-zone to standard density.	Accept in part	Well Functioning Urban Environment
04/25	04/25.02	Horowhenua District Council	-	Support in part	The medium density residential area should be extended as per the image provided in the submission. This area	Rezone area indicated to medium density.	Accept in part	Well Functioning Urban Environment

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					is well suited for medium density development because it is located near open space, the commercial zone, and active transport routes.			
04/25	04/25.03	Horowhenua District Council	-	Support in part	Given the plan change encourages an increase in building density, there may be some instances where buildings that exceed the maximum permitted height may be appropriate. The proposed plan change does not currently have any direction on this matter. The introduction of a policy relating to this matter would assist with implementation.	Introduce a policy guiding how proposals for a height breach should be determined.	Accept	Urban Form, Character, and Amenity
04/25	04/25.04	Horowhenua District Council	-	Support in part	Rainwater tanks are a requirement in the residential zone. However, it is not	Include an advice note clarifying how these requirements should	Accept	Infrastructure

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					clear how this requirement will apply to multiple joined dwellings.	apply to multiple joined dwellings.		
04/25	04/25.05	Horowhenua District Council	-	Support in part	The current provision which sets out the requirements for rainwater tanks could be clarified by the addition of wording specifying that the tanks are required to be designed and installed in accordance with the requirement.	Addition of wording specifying that tanks are required to be designed and installed in accordance with the requirement.	Accept	Minor drafting edits
04/25	04/25.06	Horowhenua District Council	-	Support in part	The s32 report references a non-notification provision for all complying subdivisions. This provision appears in the commercial, open space, and greenbelt residential zone, but not the residential zone. This appears to be an error.	Introduce a non-notification provision for complying residential subdivision.	Accept	Minor drafting edits
04/25	04/25.07	Horowhenua District Council	-	Support in part	Currently Table 15A-3 only requires a	Amend Table 15A-3 Standards Applying to	Accept	Minor drafting edits

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					concept plan for medium density standalone dwellings. However, it appears that this should also apply to attached units.	Subdivision and Residential Dwelling Units to include a "": reference for Medium Density Attached Units: 150m2.		
04/25	04/25.08	Horowhenua District Council	-	Support in part	At present the requirement for "Those matters described in Sections 108 and 220 of the RMA" to be considered as a matter of discretion only applies in some zones. It is noted this requirement appears in the remainder of the Horowhenua District Plan. This should be addressed for consistency.	Include "Those matters described in Sections 108 and 220 of the RMA" as a matter of discretion for restricted discretionary subdivision in all zones.	Accept	Minor drafting edits
04/25	04/25.09	Horowhenua District Council	-	Support in part	Matters of discretion (i) and (ii) of 15A.8.1.4(a) are quite similar and could be combined	Combine matters 15A.8.1.4(i) and 15A.8.1.4(iii) into one	Accept	Minor drafting edits
04/25	04/25.10	Horowhenua District Council	-	Support in part	That 15A.8.2.2(b)(i) and 15A.8.2.3(b)(ii)	Reword provision to be clear that the standard	Accept	Minor drafting edits

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					be reworded for clarification purposes to be consistent with the requirements of the National Policy Statement on Urban Development. It should be clear that car parking is not required (with the exception of disabled parking) but that if on site car park that car parking is not required (with the exception of disabled parking) but that if on site car park is provided then it should be to the rear of the building(s).	only applies where the applicant chooses to provide carparking.		
04/25	04/25.11	Horowhenua District Council	-	Support in part	Introduce a policy to clarify the purpose of the Arapaepae Road Special Treatment Overlay and associated rules.	Introduce a policy to clarify the purpose of the Arapaepae Road Special Treatment Overlay and associated rules.	Accept	Well Functioning Urban Environment
04/25	04/25.12	Horowhenua District Council	-	Support in part	Correct the second bullet point of standard 15A.6.2.6(c), fencing	Correct the second bullet point of standard 15A.6.2.6(c), fencing in relation to 'other	Accept	Urban Form, Character, and Amenity

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					in relation to ‘other boundaries’, to say the maximum height of the fence when it meets the road shall be 1.2m (not 1m), to be consistent with standard 15A.6.2.(a), front road boundary.	boundaries’, to say the maximum height of the fence when it meets the road shall be 1.2m (not 1m), to be consistent with standard 1A.6.2.(a), front road boundary.		
04/25	04/25.13	Horowhenua District Council	-	Support in part	Currently it could be difficult to determine what qualifies as a serviced based commercial activity.	Include examples of “service based” commercial activities” to Policy 6A.5.2 to improve clarity.	Reject	Minor drafting edits
04/25	04/25.14	Horowhenua District Council	-	Support in part	Improve the clarity of the provisions through the proposed wording changes.	Make the following additions (shown in underline italics) to 15A.1.2 (a) to improve clarity - Commercial Activities (excluding entertainment activities) occupying a maximum floor area of up to 250m2, Retail Activities occupying a maximum floor area of up to 250m2.	Reject	Minor drafting edits
04/25	04/25.15	Horowhenua District Council	-	Support in part	Improve the clarity of the provisions through the	Maximum floor area limits.	Accept	Minor drafting edits

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					proposed wording changes.			
04/26	04/26.01	Horowhenua District Residents and Ratepayers Association	-	Oppose	The submitter questions whether hydrology maps and the location of water courses were considered to developing the Plans for Tara-Ika, what steps will be taken to prevent adverse effects on water, and what steps were taken to engage with all those affected by water entering Lake Horowhenua.	Unclear.	Reject	Infrastructure
04/26	04/26.02	Horowhenua District Residents and Ratepayers Association	-	Unclear	The submitter questions whether there is a proposal for a roundabout at the intersection of Arapaepae Road and the termed 'Liverpool Street extension' and, if not, why not.	Unclear.	Reject	Transport
04/26	04/26.03	Horowhenua District Residents and	-	Oppose	The submitter questions whether infrastructure has	Unclear.	Reject	Infrastructure

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		Ratepayers Association			sufficient capacity to cope with additional loading from Tara-Ika and the financial impacts of installing and maintaining new infrastructure in Tara-Ika.			
04/26	04/26.04	Horowhenua District Residents and Ratepayers Association	-	Unclear	The submitter questions what measures are proposed within the proposed plan change to manage effects arising from climate change. The submitter also seeks modelled hydrological changes to the water table across the District and proposed measures to mitigate risk of damage to infrastructure.	Unclear.	Reject	Natural Environment and Sustainability Matters
04/26	04/26.05	Horowhenua District Residents and Ratepayers Association	-	Unclear	The submitter questions whether development contributions will be reintroduced before	Unclear.	Reject	Non-RMA Matters

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					the Proposed Plan Change is adopted.			
04/26	04/26.06	Horowhenua District Residents and Ratepayers Association	-	Unclear	The submission questions what steps are being taken to ensure the proposed plan change content (e.g. structure plan, rules, objectives, and policies are followed).	Unclear.	Reject	Whole Plan Change and General Matters
04/26	04/26.07	Horowhenua District Residents and Ratepayers Association	-	Unclear	The submitter questions whether there is sufficient resources available to build 400 houses a year and, if not, what Council's responsibility on this matter is.	Unclear.	Reject	Non-RMA Matters
04/26	04/26.08	Horowhenua District Residents and Ratepayers Association	-	Unclear	The submitter questions the social impacts of mixed density development.	Provide an assessment of the social impacts arising from mixed density development.	Reject	Well Functioning Urban Environment
04/26	04/26.09	Horowhenua District Residents and	-	Unclear	The submitter questions whether sufficient space has been allocated for	Unclear.	Reject	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
		Ratepayers Association			carparking around the commercial zone.			
04/27	04/27.01	Brendan McDonnell	-	Support	Supports the plan change.	Changes to the specific provisions as detailed in following submission points.	Accept in part	Whole Plan Change and General Matters
04/27	04/27.02	Brendan McDonnell	-	Support in part	Seek to be involved in conversations about street naming, alongside Council, iwi and the community. In particular for some street names to reflect the submitter's Irish heritage.	Involvement in street naming process.	Accept in part	Culture and Heritage
04/27	04/27.03	Brendan McDonnell	-	Oppose	Subdivision should be a controlled activity rather than discretionary activity.	Change activity status of complying subdivision to controlled.	Reject	Whole Plan Change and General Matters
04/27	04/27.04	Brendan McDonnell	-	Oppose	The matters of discretion for subdivision are too restrictive and will add additional cost and delay, including the design and layout of subdivision, the timing and staging of works, and	Simplify the matters of discretion.	Accept in part	Whole Plan Change and General Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					minimising the use of cul-de-sacs.			
04/27	04/27.05	Brendan McDonnell	-	Support in part	Change the low density zoning on the Tararua Road side of the submitter's property.	Change the low density zoning on the Tararua Road side of the submitter's property.	Accept in part	Well Functioning Urban Environment
04/27	04/27.06	Brendan McDonnell	-	Support in part	The submitter would like to make provision for a retirement village.	Enable retirement villages.	Reject	Well Functioning Urban Environment
04/27	04/27.07	Brendan McDonnell	-	Support in part	Consider the location of high voltage transmission lines in regard to heath and visual impact.	No change requested.	Reject	Infrastructure
04/28	04/28.01	Electra	-	Support in part	The submitter supports plan changes that support good urban design, but is concerned the proposed plan change does not provide sufficient protection for the existing power lines.	Work with Council to ensure safe and beneficial outcome.	Reject	Infrastructure
04/29	04/29.01	Rangeview Villas Body Corporate	-	Oppose	The submitter refers to the proposed roading connection	Remove reference to a Liverpool Street	Reject	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					with Arapaepae Road directly opposite Liverpool Street, Levin and the concept of this being connected in the future. The submitter opposes this on the basis that it will cause disruption, reduced values, and safety issues for Rangeview Villas residents and that this connection is not required.	extension in all planning documents.		
04/30	04/30.01	Horizons Regional Council	-	Support in part	The submitter generally supports plan changes that provide for growth by giving effect to a growth strategy or master plan. This approach is considered, in general, to give effect to One Plan Objective 3-3 and Policy 3-4.	None	Accept in part	Whole Plan Change and General Matters
04/30	04/30.02	Horizons Regional Council	Objective 6A.3, Policies 6A.3.1 & 6A.3.3, Objective 6A.6,	Support in part	The submitter notes that Lake Horowhenua is a threatened habitat	Policy 6A.6.2 Ensure public parks are of a size, shape and type that enables functional and	Accept in part	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
			Rule 15A.6.2.1, Policy 6A.6.2 Rulee 15A.8.1.2		under the One Plan and that discharge of stormwater is a non-complying activity. The Koputaroa catchment has known flood carrying capacity issues and the submitter holds indicative ponding information which suggests there may be areas in Taraika that experience surface ponding during heavy rain. The submitter supports objectives, policies, and rules relating to managing the quantity and quality of stormwater, specifically provisions Objective 6A.3, Policies 6A.3.1 & 6A.3.3, Objective 6A.6, Rule 15A.6.2.1 (rainwater tanks) and requirements to comply with Chapter 24 of the District	recreational uses by requiring all subdivision and development to comply with Structure Plan 013. Provision 15A.8.1.2(a) Matters of Discretion for Subdivision (vi) provision of land for publically accessible open space and recreation that is appropriately located and of a practicable size and shape to support management of stormwater during heavy rain events in accordance with Structure Plan 013.		

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					Plan. However the submitter requests some changes to the wording of Policy 6A.6.2 and provision 15A.8.1.2 so that they more clearly give effect to related Objective 6A.6. Requested additions shown in italics underlined.			
04/30	04/30.03	Horizons Regional Council	-	Support in part	The submitter notes that the Three Waters Infrastructure Plan supporting PPC4 states that large private carparks and commercial roofs over 500m2 need to provide their own water quality treatment, but that there is no explicit provision requiring this in the proposed plan change.	Include an explicit provision relating to stormwater management on large private carparks and commercial roofs over 500m2.	Accept in part	Infrastructure
04/30	04/30.04	Horizons Regional Council	-	Support in part	The submitter supports the requirement for rainwater tanks on	Introduce a non-complying activity status for residential activities	Reject	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					residential properties, but requests non-complying activity status where these are not provided.	that do not provide an onsite rainwater tank.		
04/30	04/30.05	Horizons Regional Council	-	Support in part	The submitter supports inclusion of objectives, policies, and rules that seek to achieve connectivity, safety, and transport choice. Specifically the submitter supports Objective 6A.1, Policy 6A.1.1, and Rule 15A.6.1.1. The submitter supports medium density development in the centre of Tara-lka as this supports connectivity and active and public transport options. The submitter notes a lack of provision for public transport in the proposed plan provisions. The submitter requests	Objective 6A.4 Achieve a high amenity, connected, walkable environment. Policy 6A.4.2 Enable and encourage a range of housing types and section sizes in Taraika to meet the variety of needs and preferences in our community, while ensuring a high level of residential amenity and connectivity. 15A.8.1.2 Subdivision (a) Matters of Discretion (viii) The provision of any new roads, cycleways, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, car	Accept	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					some changes to the wording of proposed plan change policies and provisions to improve clarity and make specific reference to public transport. Additions shown in italics underlined.	parking and manoeuvring areas, bus stops and tuning areas, and any necessary easements.		
04/30	04/30.06	Horizons Regional Council	-	Support in part	The submitter states that consideration should be given to how public and school bus services will enter and exit Tara-Ika from Arapaepae Road and that consideration needs to be given to how safe crossing locations will be provided for pedestrians and cyclists, particularly before and during construction of O2NL.	Consideration for how buses, pedestrians, and cyclists will enter and exit the development from Arapaepae Road.	Accept in part	Transport
04/30	04/30.07	Horizons Regional Council	-	Support in part	The submitter states there is no modelled flood data for this area, which does not	Delete reference to the 2008 Horizons hazards	Accept	Natural Environment and

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					mean there is no history of flooding - just that there is no data. The submitter supports the inclusion of Rule 15A.8.3.1 Subdivision (a) Matter of Discretion (ix) avoidance and mitigation of natural hazards but requests reference to the 2008 Horizons hazards report be deleted, for consistency with other provisions within the proposed 15A chapter.	report in 15A.8.3.1(a)(xi).		Sustainability Matters
04/30	04/30.08	Horizons Regional Council	-	Support	The submitter supports Rule 15A.8.4.1(b) Condition (i), in particular the requirement for lots not serviced by reticulated waste water to be at least 5,000m2 as this is consistent with One Plan requirement.	None.	Accept	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					The submitter also supports the restricted discretionary activity status.			
04/30	04/30.09	Horizons Regional Council	-	Support	The submitter notes that the proposed plan change area is largely covered by Class 3 soils, with a small patch of Class 2 soils in the rural residential subdivision and reserve. Subject to this being the cases, One Plan Objective 3-4 and Policy 3-5 would be unlikely to apply	None.	Accept in part	Whole Plan Change and General Matters
04/30	04/30.10	Horizons Regional Council	-	Oppose	One Plan Objective 3-2: Energy and Policy 3-7 seek to encourage renewable energy and energy efficient developing, including through housing and subdivision design and layout. The submitter does not	Objective 6A.1 To achieve an integrated, efficient, and connected development...- encouraging subdivision and development design to enable energy efficiency and reduced energy consumption Insert a new policy 6A.1.6 Require	Accept	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					consider PPC4 gives effect to this objective and policy and seeks changes to the wording of objectives, policies, and rules to encourage energy efficient design. Additions shown in <i>italics underline</i> .	subdivision layout that will enable buildings to utilise energy efficiency and conservation measures. Amend Rule 15A.8.1.2 Subdivision (a) Matters of Discretion (iii) The design and layout of the subdivision, including the size, shape and position of any lot, as well as the future land use and development of each lot. In addition, connectivity and linkages (both within and beyond the subdivision), energy efficiency and conservation, and access to solar energy.		
04/30	04/30.11	Horizons Regional Council	-	Oppose	The submitter states that there are two areas of threatened habitats in Taraika. One of these is designated as Waiopehu Reserve on Structure Plan 013. However, the	Appropriately identify the indigenous vegetation area in the north-west on Structure Plan 013.	Accept in part	Natural Environment and Sustainability Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					other is near to the Open Space area within the Arapaepae Road Special Effects Overlay but does not appear to be identified or protected. Land disturbance and vegetation clearance of these areas is a Non-Complying Activity in the One Plan.			
04/30	04/30.12	Horizons Regional Council	-	Support in part	The submitter states that there are several waterways flowing through Tara-Ika which have Domestic Food Production Value under the One Plan. Many activities associated with subdivision (e.g. land disturbance, vegetation clearance etc.) will trigger resource consent under the One Plan where these activities occur in or adjacent	Include general wording near the beginning of Chapter 15A advising plan users of One Plan requirements.	Accept	Natural Environment and Sustainability Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					to such streams and in or adjacent to threatened habitats.			
04/31	04/31.01	Incite (on behalf of a range of Redwood Grove properties)	-	Oppose	The submitter states that the proposed 'standard residential' zoning for Redwood Grove does not align with Objective 6A.4 of the Plan Change and that this zoning should be changed to low density, in line with earlier versions of the Master Plan, to better give effect to this objective.	Change rezoning of Redwood Grove properties and properties adjoining Redwood Grove to low density residential.	Reject	Well Functioning Urban Environment
04/31	04/31.02	Incite (on behalf of a range of Redwood Grove properties)	-	Oppose	The submitter opposes the local roads which connect Redwood Grove into the rest of Tara-Ika. This is on the basis that the Redwood Grove properties are subject to a private covenant which prevents this from happening. The submitter also opposes the current	Remove the local roads connecting Redwood Grove and Tara-Ika and shift the arterial and collector roads east and west of Redwood Grove, so they are at least 100m away.	Reject	Well Functioning Urban Environment

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					position of the arterial and collector roads east and west of Redwood Grove, submitting that they will have an adverse impact on the amenity of the existing properties.			
04/31	04/31.03	Incite (on behalf of a range of Redwood Grove properties)	-	Oppose	The submitter is concerned that the proposed infrastructure (including roading, three waters infrastructure, power, telecommunications, and gas) needed to service Tara-Ika will have a negative impact on the current amenity they enjoy.	Unclear.	Reject	Infrastructure
04/31	04/31.04	Incite (on behalf of a range of Redwood Grove properties)	-	Oppose	The submitter is concerned that the proposed rezoning will have a financial impact on Redwood Grove properties, through an increase in rates, given Council	None.	Reject	Non-RMA Matters

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					does not charge financial or development contributions.			
04/31	04/31.05	Incite (on behalf of a range of Redwood Grove properties)	-	Neutral	The submitter requests that the Plan Change hearing be heard solely by qualified and experienced independent commissioners.	None.	Reject	Non-RMA Matters
04/31	04/31.06	Incite (on behalf of a range of Redwood Grove properties)	-	Oppose	Recognise and protect character of Redwood Grove.	The submitter requests that in addition to Redwood Grove and adjoining properties being zoned Low Density Residential instead of Standard Residential as proposed, they also be subject to a 'buffer' changing the minimum site size for these properties to 2,000m2.	Reject	Well Functioning Urban Environment
04/31	04/31.07	Incite (on behalf of a range of Redwood Grove properties)	-	Oppose	The submitter seeks a screening provision along the boundaries of some Redwood Grove properties (refer to attached map) to protect the amenity of Redwood	Introduce a screening provision as a matter of discretion for subdivision as follows: 15A.8.1.2 Subdivision (a) Matters of Discretion (xxi) Any subdivision within the Redwood	Reject	Urban Form, Character, and Amenity

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					Grove residents and provide privacy for adjoining neighbours. This ranges from 2.1m fence on some properties, a 6m wide and 3-5m native plant screen, to no screening requirement.	Grove Buffer is to provide screening on the common boundary with any property on Redwood Grove as per the direction detailed on Planning Map 30 (refer to amended map provided by submitter). In order to satisfy this matter of discretion, the application for subdivision must include details of any landscaping or fencing as per the direction detailed on Planning Map 30 and must specify mechanisms for ongoing maintenance and legal protection of any necessary screening.		
04/32	04/32.01	Leith Consulting	15A.6.1.1	Oppose	The submitter considers that further assessment into the feasibility of requiring properties fronting Strategic Cycleways to be accessed via rear access lane only. The submitter states	Further consideration of the feasibility of the existing provision and exploration of alternatives.	Reject	Transport

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					that this could deter development and/or result in a number a resource consents being sought to depart from this standard which could collectively adversely impact on the integrity of the Structure Plan. The submitter also notes there could be other means of achieving a safe cycling environment.			
04/32	04/32.02	Leith Consulting	15A.6.2.1	Support in part	The submitter supports the requirement for rainwater tanks, however seeks further flexibility on the size, shape, and nature of the tanks to assist with the tanks integrating with the built environment. For example, the specified tank size should be a minimum size rather than	Review rainwater tank provision in line with the submitter's suggestions.	Accept in part	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					prescribed, with consideration given to other factors such as larger tanks connected to toilet flushing and outdoor taps, clarification of bulk and location requirements, explicit standards prohibiting non-potable water uses connecting to the town water supply, and further safe guards to protect against cross contamination.			
04/32	04/32.03	Leith Consulting	15A.6.2.4	Support in part	The submitter seeks clarification on how the building setback from front boundary standard applies to a structure housing a vehicle, seeking that in cases where a vehicle takes direct entry to a structure from the road, a 5m setback should apply with the 2m setback	Impose a standard requiring structures housing vehicles to be setback 5m from the road boundary.	Accept in part	Urban Form, Character, and Amenity

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					applying to living areas.			
04/32	04/32.04	Leith Consulting	15A.8.1.2(a) & 15A.8.1.2(b)	Support in part	The submitter suggests that the conditions and matters of discretion for subdivision be given further consideration in regard to how they enable and facilitate medium density development. In particular, the submitter suggests that medium density should be design-led rather than allotment size led. The submitter suggests reducing the number of conditions and matters of discretion and replacing these with a robust design guide focusing on positive urban design outcomes.	Review medium density provisions, with a view of introducing a design-led rather than condition-led approach.	Reject	Well Functioning Urban Environment
04/33	04/33.01	Truebridge Associates	Issue 6A.1	Support in part	The submitter notes a typo in the second	Correct typo.	Accept	Minor drafting edits

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					line of the first paragraph.			
04/33	04/33.02	Truebridge Associates	Issue Discussion Paragraph 3	Support in part	The submitter notes the word "a" is missing from the third line of paragraph three.	Correct typo.	Reject	Minor drafting edits
04/33	04/33.03	Truebridge Associates	Explanation and Principal Reasons	Support in part	The submitter states that it is important that not only Māori Culture is recognised and that a collaborative approach is taken to recognise current owners as well, achieving a balance of all cultures in the naming of streets and reserves.	Expand the explanation and principal reason to include reference to a range of cultures.	Accept in part	Culture and Heritage
04/33	04/33.04	Truebridge Associates	Methods for Issues and Objectives	Oppose	The submitter states that statement at the top of page 10 is incorrect as they believe it is inconsistent with the activity status of subdivision.	Linked to submission point 04/33.08.	Reject	Whole Plan Change and General Matters

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04/33	04/33.05	Truebridge Associates	Methods for Issues and Objectives	Oppose	The submitter states that bullet point 4 on page 10 of Chapter 6A needs to be clear that infrastructure as required for the particular proposal as its share of the overall requirements for the greater area.	Clarify intent of bullet point 4 on page 10 of Chapter 6A.	Reject	Infrastructure
04/33	04/33.06	Truebridge Associates	Methods for Issues and Objectives	Oppose	The submitter states that the heading 'other' on page 10, needs to include reference to developers.	The submitter states that the heading 'other' on page 10, needs to include reference to developers.	Reject	Non-RMA Matters
04/33	04/33.07	Truebridge Associates	15A.1	Oppose	The submitter states that paragraph 3 of page 1 needs to be amended to refer to 'existing areas' rather than 'existing zones'.	Amend paragraph 3 of page 1 of chapter 15A To refer to 'existing areas' rather than 'existing zones'.	Reject	Minor drafting edits
04/33	04/33.08	Truebridge Associates	15A.3.1(a)	Oppose	The submitter seeks that subdivision of land in all zones be a controlled activity, rather than restricted discretionary to give certainty to developers.	Make subdivision a controlled activity, subject to conditions.	Reject	Whole Plan Change and General Matters

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04/33	04/33.09	Truebridge Associates	15A.3.3	Oppose	The submitter opposes restricted discretionary activity status for commercial buildings on the basis that there are standards to follow.	Change activity status to permitted.	Reject	Well Functioning Urban Environment
04/33	04/33.10	Truebridge Associates	15A.4	Oppose	The submitter states there are no activities listed under the Discretionary Activity heading.	Add Discretionary Activities.	Reject	Minor drafting edits
04/33	04/33.11	Truebridge Associates	15A.4.2	Oppose	Consequential change to 15A.4.2 - the submitter states that subdivisions that do not comply with the "controlled" activity conditions (rather than restricted discretionary activity conditions) should be a discretionary activity.	Consequential change to 04/33.08.	Reject	Whole Plan Change and General Matters
04/33	04/33.12	Truebridge Associates	15A.4.3(b)	Oppose	The submitter notes the word "not" is missing from the second line.	Add "do not comply" to 15A.4.3(b).	Accept	Minor drafting edits

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04/33	04/33.13	Truebridge Associates	15A.5 & 15A.5.1.1	Oppose	The submitter opposes the non-complying activity status for vehicle crossings in Strategic Cycleways. The submitter states that there are a number of cycle and walkways with site access over them elsewhere in the District and that this activity status will slow or stop development in affected areas.	Provide for crossings in strategic cycleways as a controlled activity when accompanied by a traffic assessment.	Reject	Transport
04/33	04/33.14	Truebridge Associates	15A.6.2.1	Unclear	The submitter states that the detailed requirements for rainwater tanks should be in the Engineering Standards, not within the Tara-Ika chapter.	Relocate rainwater tank provisions to engineering standards chapter of the Plan.	Reject	Infrastructure
04/33	04/33.15	Truebridge Associates	15A.6.2.3	Oppose	The submitter states that the rule requiring integral garages to be either recessed back from the main pedestrian	Review design guide before including such as provision.	Reject	Urban Form, Character, and Amenity

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					entrance by 1m or account for no more than 50% of the front façade of the dwelling is a design guide issue.			
04/33	04/33.16	Truebridge Associates	15A.6.2.6	Oppose	The submitter states that fence paling height of 1.2m in uneconomic and wasteful.	None specified.	Reject	Urban Form, Character, and Amenity
04/33	04/33.17	Truebridge Associates	15A.6.3.1(b)	Oppose	The submitter specifies there is a typo in the standard.	Correct typo.	Accept	Minor drafting edits
04/33	04/33.18	Truebridge Associates	15A.6.3.1(b)	Oppose	The submitter states that the provision relating to 'inside display window' signs is very hard to interpret and should not be required.	Remove 'inside display window' rule.	Accept	Urban Form, Character, and Amenity
04/33	04/33.19	Truebridge Associates	15A.8.1.1(b)(i)	Oppose	The submitters notes a typo in the word "designed".	Correct typo.	Accept	Minor drafting edits
04/33	04/33.20	Truebridge Associates	15A.8.1.2(a)	Oppose	Linked to the submitters request that subdivision should be a controlled activity,	Shift 15A.8.1.2(a) Matters of Discretion - (i), (vi), (x), (xii), (xiii), (xv), (xix), (xx) to matters of control and remove	Accept in part	Whole Plan Change and General Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					the submitter requests that several 'matters of discretion' for subdivision be shifted to 'matters of control' and that a number of other 'matters of discretion' be removed entirely.	all remaining matters of discretion.		
04/33	04/33.21	Truebridge Associates	15A.8.1.2(b)	Oppose	The submitter opposes the requirement for a building siting plan to be submitted for medium density subdivision on the basis the requirement is unclear and too restrictive.	Amend requirement to just require a potential building option.	Reject	Well Functioning Urban Environment
04/33	04/33.22	Truebridge Associates	-	Oppose	The submitter states the provision relating to infrastructure requirements for subdivision (e.g. 15A.8.1.2(b)(ii) should be amended for all zones to reflect the costs of providing infrastructure beyond	Amend 15A.8.1.2(b)(ii) and corresponding provisions for other zones to provide for offsetting of infrastructure costs.	Accept in part	Infrastructure

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					what is required for the individual development (e.g. for future proofing) should be offset.			
04/33	04/33.23	Truebridge Associates	-	Oppose	Linked to the submitters request that subdivision should be a controlled activity, the submitter requests that several 'matters of discretion' for subdivision be shifted to 'matters of control' and that a number of other 'matters of discretion' be removed entirely.	Shift 15A.8.2.4(a) Matters of Discretion - (v), (vi), (vii), (ix), (x), (xiii), (xiv) to matters of control and remove (iii), (iv),(xi), (xii) entirely.	Accept in part	Whole Plan Change and General Matters
04/33	04/33.24	Truebridge Associates	15A.8.3.1	Oppose	Oppose matter of discretion (iii).	Remove matter of discretion 15A.8.3.1(a)(iii).	Reject	Whole Plan Change and General Matters
04/34	04/34.01	WKNZTA	-	Support in part	WKNZTA is generally supportive of the intent to provide additional housing, but has some concerns about the	None.	Accept in part	Whole Plan Change and General Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					level of information provided and the provisions currently proposed to protect existing SH57 and proposed O2NL.			
04/34	04/34.02	WKNZTA	-	Neutral	WKNZTA note that O2NL passes through Tara-Ika but that the design is not sufficiently advanced to determine the final form and required mitigation. WKNZTA seek development within 100m either side of the indicative corridor be either 'downzoned' to Low Density Residential (as opposed to the proposed standard density) or be staged to occur after O2NL. WKNZTA also seek ongoing collaboration with Council on this matter.	Change the zoning of the land on either side of the indicative O2NL corridor to low density residential, or stage the zoning so that development in this area happens after O2NL decisions are made.	Accept in part	O2NL Impact, Interface, and Timing
04/34	04/34.03	WKNZTA	-	Support in part	WKNZTA note that Tara-Ika will increase traffic onto existing	Further information about potential roading	Reject	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					SH57, the associated east/west intersections, and the wider roading network which need further assessment and potentially upgrading.	impacts to enable upgrade planning.		
04/34	04/34.04	WKNZTA	-	Support in part	WKZNTA seeks provision for open space and the north-south, east-west corridors be strengthened.	Unclear.	Accept in part/reject	Well Functioning Urban Environment
04/34	04/34.05	WKNZTA	-	Support in part	WKNZTA seek a number of transport related 'amenity' improvements, including traffic calming to reduce traffic speed, reduced speed limits, cycle lanes, place making, prioritisation of pedestrians at traffic lights and improving co-ordination between water, transport, and landscape systems.	Range of transport related amenity improvements.	Reject	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/34	04/34.06	WKNZTA	-	Support in part	WKNZTA support the inclusion of indoor noise design standards in line with their guidance material, for properties near to the existing state highway. However, WKNZTA seek additional provisions to control noise effects, including reduced density or no build zones where current SH57 and 100m either side of the 300m wide indicative O2NL corridor.	Either change the zoning of land between Arapaepae Road and the O2NL corridor be zoned low density residential, while the land covered by the 300m indicative O2NL corridor and the land 100m either side be either zoned low density residential or have no development rights. WKNZTA propose they could reconsider the 'no development' area through the O2NL Notice of Requirement Process.	Accept in part	O2NL Impact, Interface, and Timing
04/34	04/34.07	WKNZTA	-	Oppose	WKNZTA note that the development will accommodate a significant number of people, increasing the amount of traffic needing to cross SH57 but this has not been subject to an Integrated Traffic Assessment.	Prepare an integrated traffic assessment to inform future assessment of large scale subdivision and development that results from the plan change and respond accordingly (for example, consider introducing	Reject	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
						development thresholds).		
04/34	04/34.08	WKNZTA	-	Oppose	WKNZTA seek that the development area be staged to align with the WKNZTA Safe Networks Programme and the O2NL programme, with the ability to decline subdivisions where the state highway does not have the capacity for additional vehicle movements.	Stage the development around the WKNZTA Safe Networks Programme and introduce the ability to decline subdivisions when there is insufficient capacity in the state highway network.	Reject	Transport
04/34	04/34.09	WKNZTA	-	Neutral	WKNZTA notes that SH57 is likely to be revoked once O2NL is open but that this work is yet to begin. The submitter requests consideration of how development between SH57 and O2NL occurs to ensure connectivity and integration, given	That conversations about revocation occur to ensure integrated roading design	Accept in part	O2NL Impact, Interface, and Timing

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					the revocation project is yet to start.			
04/34	04/34.10	WKNZTA	-	Support in part	WKNZTA support the requirement for onsite stormwater detention and emphasise the importance of good stormwater design to avoid runoff entering the state highway network.	Continue discussions for an integrated stormwater management solution.	Accept in part	Infrastructure
04/34	04/34.11	WKNZTA	-	Oppose	WKNZTA are concerned about the impact that signage on or near the State Highway could have on traffic safety.	Include standards requiring WKNZTA signage standards to be complied with and specify that digital sign boards visible from the state highway should be a non-complying activity.	Accept in part	Transport
04/34	04/34.12	WKNZTA	-	Oppose	WKNZTA seek that commercial activities adjoining or taking access from a State Highway should be a non-complying activity.	Commercial activities adjoining or taking access from a State Highway should be a non-complying activity.	Reject	Transport

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/35	04/35.01	MTA	-	Neutral	The submission sets out Muaūpoko rohe and historic association with the land and establishes a clear link between Muaūpoko wellbeing and the whenua (land), maunga (mountain), lakes and waterways in the area.	Refer to other submission points.	Accept in part	Culture and Heritage
04/35	04/35.02	MTA	-	Neutral	The submission details that there are a number of sites of historic and cultural significance to Muaūpoko, including Waiopehu Reserve and Maunu Wāhine. Waiopehu Reserve contains native bush and is the habitat of the endangered native carnivorous snail, Powelliphanta traversi. Muaūpoko has kaitiaki obligations over these and other species.	Appropriate protection of cultural sites, native species, and habitats.	Accept in part	Culture and Heritage

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/35	04/35.03	MTA	-	Neutral	The submission details Crown breaches of the Treaty of Waitangi and the impact that this had on Muaūpoko people.	Refer to other submission points.	Reject	Culture and Heritage
04/35	04/35.04	MTA	-	Neutral	The submission notes that Muaūpoko have an obligation to care for, protect, and enhance the natural environment. The submissions notes concerns about the potential impact of water takes and stormwater and waste water discharges on waterways.	Ensure protection of native species and habitats and good environmental outcomes for waterways.	Accept in part	Infrastructure
04/35	04/35.05	MTA	-	Neutral	The submission notes that the Tara-Ika growth area is located within an area that Muaūpoko have been in for over 1000 years and therefore is likely to contain artefacts, sites of	Earthworks and other construction must be subject to robust cultural monitoring protocols and accidental discovery processes agreed with Muaūpoko.	Accept in part	Culture and Heritage

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					archaeological significance or possibly Tangata koiwi that could be uncovered during construction.			
04/35	04/35.06	MTA	-	Neutral	The submission notes the opportunity to create a positive legacy, including new jobs, planting, housing (including affordable housing), and cultural expression.	Prioritisation of Muaūpoko members in new jobs, use of planting to enhance and restore waterways, specific provisions in the Plan Change to require provision of housing for people on low-moderate incomes, and take specific steps to connect cultural and spiritual history.	Accept in part	Non-RMA Matters
04/35	04/35.07	MTA	-	Neutral	The submission notes the Tara-Ika project is occurring alongside the Ōtaki to North Levin highway project, which is the most significant developments to occur in the region since the railway arrived in the 1870s. The gifting of the	Recognises Muaūpoko to the design and naming of public parks and streets, implement Plan provisions to protect the connections/viewshafts between the Tararua Ranges, Taitoko/Levin, Punahau (Lake	Accept in part	Culture and Heritage

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					<p>name 'Tara' recognises this significant impact and needs to be cherished and respected. This includes Muaūpoko stories, ancestors, and association with the whenua of Tara-Ika being intentionally and consciously recognised through development stages and processes such as design, and the naming of public parks and streets. The spiritual pathway from wāhi tapu in the Tararua Range to Taitoko need to be protected from the built environment to avoid interrupting the connections and view path from the maunga to Punahau and onwards to the moana.</p>	Horowhenua) and the sea.		

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/35	04/35.08	MTA	-	Neutral	The name 'Taraika' should be spelt 'Tara-lka' in the plan change documents.	Change spelling to 'Tara-lka'.	Accept	Minor drafting edits
04/36	04/36.01	Catriona McKay	-	Support	The submitter notes general support for the proposed plan change and the emphasis on enhancing connections within and across the area, the mix of housing density, inclusion of walking and cycling tracks, and ensuring quality development.	None.	Accept in part	Whole Plan Change and General Matters
04/36	04/36.02	Catriona McKay	-	Support	The submitter seeks a cycle/walking connection from Pohutukawa Drive into the development area be reintroduced, or alternatively direct pedestrian access from the submitter's property onto the proposed arterial road along the rear (southern) boundary	A cycle/walking connection from Pohutukawa Drive into the development area shown on Structure Plan 013 or provision for direct pedestrian access from the submitter's property to the new arterial road specified.	Reject	Well Functioning Urban Environment

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					of the submitters property.			
04/36	04/36.03	Catriona McKay	-	Support in part	The submission notes a future arterial road along the southern boundary of the submitter's property. Currently this boundary is planted with large pine trees and a farm style fence. This submitter notes that this is unlikely to be consistent with the urban streetscape envisioned for the area and seeks specific consideration be given to introducing new fencing and planting types to this area that better reflect the intended outcome.	Council to remove the existing pine trees and erect a suitable fence, and install appropriate planting.	Accept in part	Urban Form, Character, and Amenity
04/37	04/37.01	Margaret Day	-	Oppose	The submitter opposes having higher density housing types in a low density area,	Build low density housing by the O2NL corridor.	Reject	Well Functioning Urban Environment

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					citing concerns about an increase in crime.			
04/38	04/38.01	Prouse Trust Partnership	Objective 6A.1, Policy 6A.1.2	Support	The submitter supports objectives and policies that seek to enhance cultural, heritage and ecological values. Specifically, the submitter supports the use of the name Tara-Ika.	None.	Accept in part	Culture and Heritage
04/38	04/38.02	Prouse Trust Partnership	-	Support in part	The submitter seeks further protection of heritage values associated with the Prouse Homestead and surrounds by avoiding/minimising impacts from stormwater management (e.g. wetlands) and roading connections.	Refer to other submission points.	Accept in part	Culture and Heritage
04/38	04/38.03	Prouse Trust Partnership	Structure Plan 013	Oppose	The submitter seeks for the road connecting their property to Redwood Grove be removed given Redwood	Remove Redwood Grove connection and 'downgrade' collector road running north-south through	Reject	Well Functioning Urban Environment

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					Grove is already established and that the collector road located on the submitter's property be changed to a local road to reduce impact on the heritage setting of the Prouse Homestead.	submitter's property to a local road.		
04/38	04/38.04	Prouse Trust Partnership	-	Oppose	The submitter seeks flexibility in where local roads are provided to allow for better lot yield and development viability.	Allow flexibility in location of local roads.	Reject	Transport
04/38	04/38.05	Prouse Trust Partnership	Structure Plan 013 and Planning Map 30	Oppose	The submitter seeks a standard residential zoning on their property (instead of low density residential) to enable better flexibility and more efficient use of land and consistency with remainder of growth area.	Change zoning to standard residential.	Accept in part	Well Functioning Urban Environment

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/38	04/38.06	Prouse Trust Partnership	Policy 6A.2.3 and Provisions 15A.8.1.2(a)(xiii) and 15A.8.1.2(b)(ii)	Oppose	The submitter opposes the requirement that developers must construct and vest all infrastructure shown on their property as this may require them to construct infrastructure over and above what is required for their development or result in land being acquired without compensation.	Address growth funding to ensure costs are distributed fairly.	Reject	Infrastructure
04/38	04/38.07	Prouse Trust Partnership	Objectives 6A.3 & 6A.6, Policy 6A.3.1	Oppose	The submitter opposes the three waters plan (appendix 6 to s32 report) on the basis that it discusses a wetland on the submitter's property as a means of dealing with stormwater from both the development area and O2NL but does not provide clarity on how intended	Remove wetland from submitter's property.	Accept in part	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					outcomes will be managed across parties.			
04/38	04/38.08	Prouse Trust Partnership	-	Oppose	The submitters raises concerns that O2NL and Tara-Ika are progressing at different speeds, resulting in issues such as showing O2NL accurately on the Structure Plan and progressing joint stormwater management options.	None specified.	Accept in part	O2NL Impact, Interface, and Timing
04/38	04/38.09	Prouse Trust Partnership	-	Oppose	The submitter opposes limits on rear sections and the infrastructure requirements specified in the matters of discretion as referenced in submission point 04/38.06.	Do not restrict rear sections, address infrastructure concerns.	Accept in part	Whole Plan Change and General Matters
04/38	04/38.10	Prouse Trust Partnership	15A.1.1.1	Oppose	The submitters seeks provision for existing activities (e.g. farming) to be made	Add 'existing activities' under 15A.1.1.1 Permitted Activities.	Reject	Whole Plan Change and General Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					under 'Permitted Activities'.			
04/38	04/38.11	Prouse Trust Partnership	-	Neutral	The submitter is concerned that rezoning the land to residential could make rates unaffordable during the time between rezoning and development occurring.	Provide rates relief.	Reject	Non-RMA Matters
04/39	04/39.01	Charles Rudd	-	Oppose	The submitter raises concerns over infrastructure planning and resulting environmental outcomes, including the impact of stormwater on Lake Horowhenua, potential for sewerage overflow, and water restrictions.	Unclear.	Reject	Infrastructure
04/39	04/39.02	Charles Rudd	-	Oppose	The submitter states that consultation with iwi has been insufficient on the	Engage with the people of Ngai Tara/Muaūpoko tribe.	Reject	Whole Plan Change and General Matters

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					basis that it has been with the Muaūpoko Tribal Authority only. The submitter states that consulting with iwi authorities only is not in accordance with Treaty of Waitangi requirements. The submitter also states that the timeframe for consultation on draft master plan (Aug-Sep 2020) was insufficient as it did not allow for public speaking rights at a Council meeting.			
04/39	04/39.03	Charles Rudd	-	Oppose	The submitter opposes the use of the name "Taraika". The submitter does not believe that MTA have the right to gift this name and states that the spelling originally put forward is incorrect.	Engage with the people of Ngai Tara/Muaūpoko tribe.	Reject	Culture and Heritage

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
04/39	04/39.04	Charles Rudd	-	Oppose	The submitter states that the plan change has insufficient information about matters such as land ownership, Gladstone Green development business owners/shareholders, and Council conflicts of interest.	Unclear.	Reject	Non-RMA Matters
04/40	04/40.01	Vivienne Gwentyth Bold	-	Oppose	The submitter opposes additional contaminants entering the Lake, the Pot, or the Sea. The submitter seeks further information about infrastructure works referred to in the Finance, Audit, and Risk agenda paper dated 27th January 2021 and seeks soil testing at Pakipaki Dunes, Hokio, and the Pot.	Sufficient water and waste planning ahead of housing construction.	Reject	Infrastructure
04/40	04/40.02	Vivienne Gwentyth Bold	-	Oppose	The submitter seeks sufficient water and waste planning, including a new	Sufficient water and waste planning ahead of housing construction.	Reject	Infrastructure

Submission Number	Submission Point	Submitter Name	Provision	Support/ Oppose	Summary of Submission	Decision Sought	Reporting Officer Recommendation	Topic in s42A where point is evaluated
					regional landfill, before new houses are built.			
04/40	04/40.03	Vivienne Gwenyth Bold	-	Oppose	The submitter opposes unsafe roundabouts that can't be used by trucks.	Unclear.	Reject	Transport
04/40	04/40.04	Vivienne Gwenyth Bold	-	Oppose	The submitter opposes ratepayers funding growth.	Seeks for development contributions to cover cost of growth.	Reject	Non-RMA Matters
04/40	04/40.05	Vivienne Gwenyth Bold	-	Oppose	The submitter opposes the use of the name "Taraika", stating it does not actually recognise Māori heritage. The submitter states that consultation on this was insufficient, as only MTA were consulted.	Unclear.	Reject	Culture and Heritage

Table of Further Submission Points – Reference to s42a Report

This table provides a complete record of recommendations in relation to all submission points. Additionally, it directs submitters' to the topic heading of the s42a report where their submission point has been evaluated. In some instances, a submission point is relevant to more than one s42a topic. In this case, the table references the point in the s42a report where the most substantive assessment is provided.

Further Submission Number	Further Submission Point	On what submission	Name	Support/ Oppose Submission	Reason	Relief Sought	Recommendation	Topic in s42a report
FS04/01	FS04/01	04/06	Lois Anne Molloy	Support	Support's submitter comment opposing location of roads with access onto Gladstone Road due to traffic impacts	Remove access onto Gladstone Road and encourage recreational activity by discourage vehicle access	Reject	Well Functioning Urban Environments
FS04/02	FS04/02	04/29	Christine Robyn Bingham	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/03	FS04/03	04/29	Pamela Adams	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/04	FS04/04	04/29	Judith Anne Stafford	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/05	FS04/05	04/29	James Courtney	Support	Impact of extending Liverpool Street through Fuller Close would have a	Remove Liverpool Street extension	Reject	Transport

					major impact on Rangeview Villas			
FS04/06	FS04/06	04/29	Derek & Dorothy Canvin	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/07	FS04/07	04/29	Janie Margaret Mocreiff	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/08	FS04/08	04/29	Delza Elizabeth Purvis	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/09	FS04/09	04/29	Josephine Dorothy Olsen	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/10	FS04/10	04/29	Diana Mary Murphy	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas, cause pollution, noise, access to the village would become more difficult and properties would be devalued	Remove Liverpool Street extension	Reject	Transport

FS04/11	FS04/11	04/29	Stella Austing	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/12	FS04/12	04/29	Maxine Rutten	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/13	FS04/13	04/29	Margaret June Foote	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas, impact on the quiet, safe environment, and devalue homes. Noise, traffic, safety effects. There are other roads available.	Remove Liverpool Street extension	Reject	Transport
FS04/14	FS04/14	04/29	Jacqueline Terrence	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/15	FS04/15	04/29	Heather Lynne Coffey	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport

FS04/16	FS04/16	04/29	Marion Wiltshire & Brian Wicker	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/17	FS04/17	04/29	Helen Clark	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/18	FS04/18	04/29	Dianna Leigh Smith	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/19	FS04/19	04/29	Robin & Jennifer Benton	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/20	FS04/20	04/29	Grant Christopher Smith	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/21	FS04/21	04/29	Marilyn Norma Morris	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport

FS04/22	FS04/22.01	04/20	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Remove low density area to maximise the residential land available, as it is difficult to revisit low density areas with infill in the future. With the loss of land that will occur with the expressway, it is important to maximise the area available for residential development	Remove low density areas within Tara-Ika	Accept in part	Well Functioning Urban Environments
FS04/22	FS04/22.02	04/06	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	Risk of poor outcomes due to risk of poorly maintained rear access	Allow access from either front or rear of site with there is careful consideration of effects, including supporting traffic assessment.	Reject	Transport
FS04/22	FS04/22.03	04/24	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	-	All bullet points 1-11 in original submission be implemented	Accept in part	Further Submissions not already assessed
FS04/22	FS04/22.04	04/25	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	Agree that medium density areas should be extended and low density areas changed to standard density to allow more efficient land use	Remove low density and increase medium density areas as shown	Accept in part	Well Functioning Urban Environments

FS04/22	FS04/22.05	04/25	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	Partially supports submission in relation to zoning type, but states complying subdivision should be permitted or controlled	Change activity status of complying subdivision to permitted or controlled	Reject	Whole Plan Change and General Matters
FS04/22	FS04/22.06	04/27	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Complying subdivision should be permitted or controlled	Change activity status of complying subdivision to permitted or controlled	Reject	Whole Plan Change and General Matters
FS04/22	FS04/22.07	04/27	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Remove low density area to maximise the residential land available	Remove low density areas within Tara-Ika	Accept in part	Well Functioning Urban Environments
FS04/22	FS04/22.08	04/28	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Current overhead lines would ideally be placed underground over time as development progresses. This should be done in collaborative way between Council, Electra, and landowners in keeping with current District Plan rules. Electra have stated they are willing to work with	All parties work together with the long term goal of undergrounding the transmission lines and that a rule in the District Plan be formulated to address this matter.	Accept in part	Infrastructure

					Council to ensure a safe and beneficial outcome.			
FS04/22	FS04/22.09	04/31	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Oppose	Changing the proposed zoning of Redwood Grove from standard density to low density on the basis of a private covenant would not be appropriate. The interested parties could cancel the covenant, allowing them to utilise the residential zoning. They should be bound by the activity status of the new zoning to be consistent with the area they are in. The location of an arterial road running of Queen Street to the east of Redwood Grove into the new hub of the area allows development two houses deep, which is ample space to buffer Redwood Grove. Utilities will be placed underground and will not be visible and the new sanitary sewer may improve the Redwood Grove's sewer service	Do not impose a low density residential overlay	Accept	Well Functioning Urban Environments
FS04/22	FS04/22.10	04/32	Truebridge Associates Limited (jointly on	Partially Support	Further consideration given to vehicle access across strategic cycleways	Consider all points raised in original submissions	Reject	Transport

			behalf of Brendan McDonnell)					
FS04/22	FS04/22.11	04/32	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Agree with comments about rainwater tanks	Consider all points raised in original submissions	Accept in part	Infrastructure
FS04/22	FS04/22.12	04/32	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Agree with comments about setbacks	Consider all points raised in original submissions	Accept in part	Urban Form, Character, and Amenity
FS04/22	FS04/22.13	04/34	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Oppose	O2NL has not commenced at this stage, but it is clear the O2NL corridor would be zoned residential. NZTA cannot suggest or have accepted zoning that are placed for the purpose of mitigating the impact of the expressway. This will reduce the value/opportunity of the land affected. Council have spent nearly three years working up three scenarios for the location of the roading corridor, tow of which have clearly	-	Accept in part	O2NL Impact, Interface, and Timing

					<p>indicated what the zoning of the land would have been if the current location had not been adopted. The upgrades to Queen Street East/SH57 is a safety upgrade related to the existing situation and is an NZTA asset. Costs or requirement cannot be placed on the rezoning of Tara-Ika. NZTA are covered by statute and it is not necessary for Council to accommodate to zone to allow for their objectives. NZTA state they could not gain a trade competition. It should be noted that if NZTA create the perception it is uncertain where the road will be, it could have an effect on land values and lower compensation they may have to pay in land acquisition.</p>			
FS04/22	FS04/22.14	04/34	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Oppose	<p>We have carried out testing within Tara-Ika development area that indicates subsurface soakage is of such a rate that onsite treatment and</p>	<p>Develop a joint wetland area for emergency events only</p>	Accept in part	Infrastructure

					disposal is possible within each development.			
FS04/22	FS04/22.15	04/38	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	We have carried out testing within Tara-Ika development area that indicates subsurface soakage is of such a rate that onsite treatment and disposal is possible within each development.	Take on board all of Prouse's requests	Accept in part	Infrastructure
FS04/22	FS04/22.16	04/07	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	There should be no additional stormwater entering downstream catchments in any rain event. Stormwater should be runoff neutral, or positive, in terms of quantity and quality.	Stormwater be dealt with via onsite soakage. Council negotiate land purchase for emergency retention areas once the expressway is built and develop this in a way that enhances and screens the expressway and increases biodiversity and amenity	Accept in part	Infrastructure
FS04/22	FS04/22.17	04/09	Truebridge Associates Limited (jointly on behalf of	Partially Support	Remove low density area to maximise the residential land available, as it is difficult to revisit low density areas with infill in the future. With the loss of land that will occur with	Remove low density areas within Tara-Ika	Accept in part	Well Functioning Urban Environments

			Brendan McDonnell)		the expressway, it is important to maximise the area available for residential development			
FS04/22	FS04/22.18	04/10	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Remove low density land and greenbelt residential to maximise the residential land available, as it is difficult to revisit low density areas with infill in the future. With the loss of land that will occur with the expressway, it is important to maximise the area available for residential development	Remove low density and greenbelt residential land from Tara-Ika	Accept in part	Well Functioning Urban Environments
FS04/22	FS04/22.19	04/11	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	Remove low density land and greenbelt residential to maximise the residential land available, as it is difficult to revisit low density areas with infill in the future. With the loss of land that will occur with the expressway, it is important to maximise the area available for residential development	Remove low density and greenbelt residential land from Tara-Ika	Accept in part	Well Functioning Urban Environments
FS04/22	FS04/22.20	04/13	Truebridge Associates Limited (jointly on behalf of	Partially Support	House water storage tanks to be mandatory as a second source of water to conserve and maximise available water resource	To require all new dwellings in Tara-Ika to have a 10,000L water storage tank	Accept in part	Infrastructure

			Brendan McDonnell)					
FS04/22	FS04/22.21	04/14	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Support	Remove low density land and greenbelt residential to maximise the residential land available, as it is difficult to revisit low density areas with infill in the future. With the loss of land that will occur with the expressway, it is important to maximise the area available for residential development	Remove low density and greenbelt residential land from Tara-Ika	Accept in part	Well Functioning Urban Environments
FS04/22	FS04/22.22	04/15	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	Stormwater should be dealt with onsite via onsite soakage and retention. Subsurface soakage indicates this can be achieved. GHD has carried out surface soakage testing which provides a low soakage rate. Sub surface soakage should be utilised with appropriate treatment.	Stormwater be dealt with via onsite soakage. Council negotiate land purchase for emergency retention areas once the expressway is built and develop this in a way that enhances and screens the expressway and increases biodiversity and amenity	Accept in part	Infrastructure
FS04/22	FS04/22.23	04/18	Truebridge Associates Limited	Partially Support	Area between SH57 and the proposed bypass should have mixed zoning	Change zoning of this area to allow	Accept in part	Well Functioning

			(jointly on behalf of Brendan McDonnell)		to allow for commercial and services activities. The area is unlikely to have quality residential development on it due to proximity of road corridors	for commercial and service activities		Urban Environments
FS04/22	FS04/22.24	04/18	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Support	The low density overlay for the south west corner of the development area should be removed to allow better utilisation of the residential zone	Remove low density zoning in the south west corner of the development area	Accept	Well Functioning Urban Environments
FS04/22	FS04/22.25	04/18	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Oppose	Disagree with the original submitters comments regarding the proximity of the arterial road off Queen Street to the east of Redwood Grove. The space between the proposed road and the eastern side of Redwood Grove to place sections two deep which will provide the buffering needed for the effects of the arterial road.	Do not change the location of the arterial road servicing the development that is located to the east of Redwood Grove	Accept	Transport
FS04/22	FS04/22.26	04/18	Truebridge Associates Limited (jointly on behalf of Brendan McDonnell)	Partially Oppose	Disagree with the original submitter's comments about the location of green spaces and educational spaces as they have been centralised inline with good planning practice and urban design. However, if	That the interested parties resolve the matter between themselves and the plan change is altered to reflect the outcome.	Reject	Well Functioning Urban Environments

					the owner of the land within which these areas lay is happy to relocate them along with other interested parties I am not overly concerned.			
FS04/23	FS04/23.01	04/25.01	Horizons Regional Council	Partially Support	Support principle of increased density in growth areas, so long as adverse effects (e.g. reverse sensitivity, integration of land use and transport networks, and increases in stormwater) can be managed.	Accept submission so long as adverse effects are managed, including avoidance of conflict between land use and transport networks and the adverse effects associated with stormwater	Accept in part	Well Functioning Urban Environments
FS04/23	FS04/23.02	04/25.02	Horizons Regional Council	Partially Support	Support principle of increased density in growth areas, so long as adverse effects (e.g. reverse sensitivity, integration of land use and transport networks, and increases in stormwater) can be managed.	Accept submission so long as adverse effects are managed, including avoidance of conflict between land use and transport networks and the adverse effects associated with stormwater	Accept in part	Well Functioning Urban Environments
FS04/23	FS04/23.03	04/34.10	Horizons Regional Council	Support	Horizons is concerned that WKNZTA's submission on stormwater (paragraph 61) suggests that attenuation areas within the O2NL corridor cannot be	Accept WKNZTA submission to amend PPC4 to address the concerns raised in relation to	Accept in part	Infrastructure

					considered within HDCs stormwater management framework. It is Horizons Manager Investigations and Design opinion that this will significantly reduce the adequacy of the capacity available in the proposed open space/basins/wetlands to avoid increase in stormwater discharge to Lake Horowhenua and Koputaroa Stream catchments	management of effects generated by development, particularly stormwater.		
FS04/23	FS04/23.04	04/35.02	Horizons Regional Council	Support	Request to protect sites of cultural and historic significance is consistent with One Plan Objective 2-1	Accept submission	Accept in part	Culture and Heritage
FS04/23	FS04/23.05	04/35.04	Horizons Regional Council	Support	Activities including discharges of stormwater and contaminants have impacts on downstream habitats and species. These can be cumulative and can extend beyond the immediate area of impact and across the wider environment. The relief sought in this submission is also consistent with One Plan Objective 2-1 (see	Accept submission	Accept in part	Natural Environment and Sustainability Matters

					submission 04/35.02 above).			
FS04/23	FS04/23.06	04.38.07	Horizons Regional Council	Partially Support	Horizons acknowledges the issues raised by the submitter in relation to the maintenance and management of constructed wetlands, including in relation to potential biosecurity (and biodiversity) risks.	Support request for clarification of how risk associated with constructed wetland/ stormwater detention will be managed.	Accept in part	Infrastructure
FS04/24	FS04/24.01	04/08	Issacs Trust	Oppose	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Accept in part	Well Functioning Urban Environments
FS04/24	FS04/24.02	04/09	Issacs Trust	Oppose	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Accept in part	Well Functioning Urban Environments
FS04/24	FS04/24.03	04/10	Issacs Trust	Oppose	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Accept in part	Well Functioning Urban Environments
FS04/24	FS04/24.04	04/11	Issacs Trust	Oppose	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Retain Greenbelt Residential Zoning adjoining Pohutukawa Drive	Accept in part	Well Functioning Urban Environments
FS04/25	FS04/25.01	04/38.01	Emma Prouse, James Prouse, Matthew	Support	Heritage value could be threatened by both O2NL and Tara-Ika. PC 4 does not	Protection of the archaeological site, homestead and curtilage and give	Accept in part	Culture and Heritage

			Prouse, James Griffiths		provide sufficient protection	sufficient regard to the site		
FS04/25	FS04/25.02	04/38.02	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Proposed stormwater management (including wetlands) and roading network could impact on the heritage value of the Prouse property	Avoid adverse effects on the Prouse Property resulting from stormwater and roading infrastructure	Accept in part	Infrastructure
FS04/25	FS04/25.03	04/38.03	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Extent and nature of roading connections on Prouse property are uneconomic and, in some cases, not required. Will also impact on heritage value of homestead.	Remove road into Redwood Grove and downgrade collector road on Prouse property to a local road	Reject	Transport
FS04/25	FS04/25.04	04/38.04	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Allow the location of local roads to be flexible to allow for better utilisation of land	Allow flexible location for local roads	Accept in part	Transport
FS04/25	FS04/25.05	04/38.05	Emma Prouse, James Prouse, Matthew Prouse,	Support	Standard density residential on the Prouse property would make better use of land, be more consistent with nearby	Replace low density with standard residential	Accept	Well Functioning Urban Environments

			James Griffiths		properties, and improve lot yield.			
FS04/25	FS04/25.06	04/38.06	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Requiring developers to vest infrastructure is unfair in that developers may have to pay for more infrastructure than they need and/or may make staging the development unviable.	Address process for growth infrastructure and allow for subdivisions to be staged.	Reject	Infrastructure
FS04/25	FS04/25.07	04/38.07	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Wetland/attenuation areas could impact heritage site.	That stormwater impact on the Prouse property be avoided	Accept in part	Infrastructure
FS04/25	FS04/25.08	04/38.08	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	O2NL and Tara-Ika are proceeding on different timeframes, increase chance of poor outcomes (e.g. stormwater management, how O2NL is displayed on the plan)	None clear	Accept in part	O2NL Impact, Interface, and Timing
FS04/25	FS04/25.09	04/38.09	Emma Prouse, James Prouse, Matthew Prouse,	Support	Oppose restriction to 5% of sections being rear sections as this is too restrictive	Allow for 2-3 lot subdivisions to not need to construct major roads and allow rear sections	Accept in part	Whole Plan Change and General Matters

			James Griffiths					
FS04/25	FS04/25.10	04/38.10	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Allow land to be utilised during the transition period and recognise historic uses of the Prouse property.	Allow existing farming activities to continue.	Reject	Whole Plan Change and General Matters
FS04/25	FS04/25.11	04/38.11	Emma Prouse, James Prouse, Matthew Prouse, James Griffiths	Support	Changing zone to residential will make rates unaffordable and unfairly force subdivision	Make provision for rates relief on properties not being used for residential.	Reject	Non-RMA Matters
FS04/26	FS04/26.01	04/31	Jennings Family Trust	Partially Oppose	The private covenant limiting subdivision in Redwood Grove could be modified or removed through agreement of Redwood Grove residents, so the Plan Change should enable development in Redwood Grove. The further submitter does not believe the buffer zone requested by the original submitter is required as the low density zoning may be adequate. The further submitter outlines range of	Retain standard density, consider options for a Redwood Grove buffer	Accept in part	Well Functioning Urban Environments

					<p>alternate lot sizes and dimensions for consideration regarding the buffer area. The submitter also partially opposes the 'no buffer' zone for property 31 Redwood Grove, stating that this would be appropriate if minimum lot size is set at 1000m2 and access to the rear of the property can be achieved off a collector or arterial road. If this is not achieved, a 6m buffer zone of native plants should be imposed with maintenance access</p>			
FS04/26	FS04/26.02	04/31	Jennings Family Trust	Partially Support	<p>The further submitter supports the original submitters position that there should be no new roads connecting in Redwood Grove, as maintaining Redwood Grove as a cul-de-sac is critical for amenity. The further submitter also supports the original submitter's comments that arterial/collector roads should be setback from Redwood Grove by at least</p>	<p>Remove roads connecting into Redwood Grove and set arterial/collector roads back 100m from Redwood Grove</p>	Reject	Transport

					100m to protect lifestyle amenity values.			
FS04/27	FS04/27	04/34	Horowhenua District Council - Infrastructure Development Group	Neutral	<p>Site investigations show that a communal stormwater management approach will be needed for Tara-Ika (e.g. wetlands). WKNZTA and HDC have been in discussions about a shared approach for Tara-Ika and O2NL. As identified in the original submitter's submission, this approach has not yet been confirmed due in part to PC4 and O2NL projects proceeding on different timeframes. It is not practical to proceed with the shared approach at the current point in time, as this could mean stormwater areas could conflict with O2NL construction and need to be moved. This means an alternative solution needs to be investigated to find an efficient and pragmatic stormwater solution that fits with both Tara-Ika and O2NL. A solution is provided with the submission</p>	Introduce a stormwater zone (or similar) in the areas shown on the attached plan	Accept in part	Infrastructure

FS04/28	FS04/28	04/29	Patrick & Janice Ludlam	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/29	FS04/29	04/29	Martin Charles Howse	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/30	FS04/30	04/29	Patricia O'Hagan	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/31	FS04/31	04/29	Colin & Ann Schrader	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/32	FS04/32	04/09	Diane & Stratton Harris	Oppose	Changing the proposed zoning adjoining Pohutukawa Drive from the notified Greenbelt residential as requested by the original submitter would have a negative impact on character/amenity (e.g. traffic, noise, lights)	Keep notified Greenbelt Residential zoning	Accept in part	Well Functioning Urban Environments
FS04/33	FS04/33	04/09	Trustee of the	Oppose	Changing the proposed zoning adjoining Pohutukawa Drive from the notified Greenbelt	Keep notified Greenbelt Residential zoning	Accept in part	Well Functioning

			Karakamea Trust		residential as requested by the original submitter would have a negative impact on character/amenity (e.g. traffic, noise, lights) and will put pressure on to cut down established trees on boundary			Urban Environments
FS04/34	FS04/34.01	04/31.01	Prouse Trust Partnership	Oppose	Oppose the request for low density to be reintroduced as this would not make the best use of the land available. Standard density zoning makes development more economic viable and it is not reasonable to expect neighbouring properties to be constrained for development by private covenants on Redwood Grove	Disallow submission	Accept	Well Functioning Urban Environments
FS04/34	FS04/34.02	04/31.02	Prouse Trust Partnership	Oppose	Oppose the request to shift arterial and collector roads to be 100m from the boundary of Redwood Grove and this would put the road 1m from the Prouse Homestead which would impact the heritage, cultural, and archaeological value	Disallow submission	Accept	Well Functioning Urban Environments

FS04/34	FS04/34.03	04/31.07	Prouse Trust Partnership	Oppose	Oppose request for 6m wide planting the boundary for screening. Will be difficult/impossible to maintain and is solely for Redwood Grove benefit. There is space for Redwood Grove to do this on their properties.	Disallow submission	Accept	Urban Form, Character, and Amenity
FS04/35	FS04/35.01	04/34.01	Prouse Trust Partnership	Oppose	The further submitter states Tara-Ika was a growth area before O2NL and that we are experiencing a housing crises. Therefore, the further submitter does not support comments by the original submitter that development should be limited if it impact SH57 or O2NL. Existing safety issues on SH57 have existed for more than 20 years and are not related specifically to development on the eastern side of Levin.	None clear	Accept in part	O2NL Impact, Interface, and Timing
FS04/35	FS04/35.02	04/34.05	Prouse Trust Partnership	Partially Support	The further support partially supports comments about traffic amenity, including traffic calming, cycle lanes, place making, prioritisation of pedestrians at traffic lights, and improved co-	Consider/support amenity road improvements in particular changing connector road to local road	Reject	Transport

					ordination between water, transport, or landscape systems. This aligns with the further submitters own requests for a local road connection north to south as this is more in keeping with the heritage value of the Prouse site.			
FS04/35	FS04/35.03	04/34.02	Prouse Trust Partnership	Oppose	The further submitter strongly opposes the further submitters request that the 300m wide O2NL 'preferred corridor' and a 100m wide be either zoned low density or staged until after O2NL. O2NL has no legal status. This request is excessive as the planning for this area was already underway when O2NL came along. It is the impact of O2NL on the site on Tara-Ika, not the reverse that are equally in question here. The request goes beyond WKNZTA guidelines. WKNZTA cannot ask for restrictions of constraints that go beyond their own guidelines to the detriment of others. WKNZTA are negatively impacting on land value prior to public	Disallow submission	Accept in part	O2NL Impact, Interface, and Timing

					works designation, the legality of doing this could be subject to contesting.			
FS04/35	FS04/35.04	04/34.06	Prouse Trust Partnership	Oppose	<p>In addition to opposing the original submitters request regarding zoning of the 300m corridor and a 100m buffer either site, the further submitter strongly opposes the original submitters request for other further provisions. The further submitter states the original submitter has not adequately assessed noise for the Tara-Ika development. HDC should ask WKNZTA to mitigate/reduce impact on the growth area. The route was chosen in full knowledge it was bordering a growth area. Reasonable expectation is that WKNZTA provide mitigation for the entire Tara-Ika zone on both sides with noise protection wall etc. The further submitter acknowledges that future house build in the noise effects zone will require sound proofing measures.</p>	Disallow submission	Accept in part	O2NL Impact, Interface, and Timing

FS04/36	FS04/36	04/09	Adam & Gaelene Praat	Oppose	Changing the proposed zoning adjoining Pohutukawa Drive from the notified Greenbelt residential as requested by the original submitter would impact on the lifestyle, native plants, and native bird life in Pohutukawa Drive	Reject whole submission and any other submissions that request only high density zoning	Accept in part	Well Functioning Urban Environments
FS04/37	FS04/37	04/29	Heather Angela Spicer	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/38	FS04/38	04/29	Edward David Crozier	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/39	FS04/39	04/29	Stafford & Marion Ball	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/40	FS04/40	04/29	Alexander Grey Davies	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport

FS04/41	FS04/41	04/29	Joan Elizabeth Rose Trevis	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/42	FS04/42	04/29	Jann & Gary Farr	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/43	FS04/43	04/29	Bruce & Susan McCarrison	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas and mean aged people will have to uproot and re-establish themselves at a vulnerable time in their life	Remove Liverpool Street extension	Reject	Transport
FS04/44	FS04/44	04/29	Christine Coates	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/45	FS04/45	04/29	Hannelore Karin Louise Herold	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/46	FS04/46	04/29	Errol & Patricia Cooper	Support	Impact of extending Liverpool Street through Fuller Close would have a	Remove Liverpool Street extension	Reject	Transport

					major impact on Rangeview Villas			
FS04/47	FS04/47	04/29	Margaret Theresia Santarelli	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/48	FS04/48	04/29	Glenyse Ellen Reynolds	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/49	FS04/49	04/29	Norman Pearson	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/50	FS04/50	04/29	Treva Albert Wilson	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/51	FS04/51	04/29	Mrs Rickson	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/52	FS04/52	04/29	Diana Bernadette Buckley	Support	Impact of extending Liverpool Street through Fuller Close would have a	Remove Liverpool Street extension	Reject	Transport

					major impact on Rangeview Villas			
FS04/53	FS04/53	04/29	Susan Mary McPherson	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/54	FS04/54	04/29	Neville & Jean Sevicke-Jones	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas and development west of Tararua Road would be a less disruptive option	Remove Liverpool Street extension	Reject	Transport
FS04/55	FS04/55	04/29	Janice Fitzgerald	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/56	FS04/56	04/29	Judith Manley	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/57	FS04/57	04/29	John & Peter Moore	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport

FS04/58	FS04/58	04/29	Andrew & Petronella Anderson	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/59	FS04/59	04/29	Bruce & Julie Curran	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/60	FS04/60	04/29	Helen Inverdale Chambers	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas and completely ruin it	Remove Liverpool Street extension	Reject	Transport
FS04/61	FS04/61	04/29	Graham & Gillian Phelps	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/62	FS04/62	04/29	Luigi Innocente Paroli	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/63	FS04/63	04/29	Raewyn Joyce Bassett	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport

FS04/64	FS04/64	04/29	Antony John & Pauline Sheppard	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/65	FS04/65	04/29	Bruce David Smith	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/66	FS04/66	04/29	Marion & Patrick Lane	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/67	FS04/67	04/29	Stephanie Vincent	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/68	FS04/68	04/29	Janice Mary Magee	Support	Impact of extending Liverpool Street through Fuller Close would have a major impact on Rangeview Villas	Remove Liverpool Street extension	Reject	Transport
FS04/69	FS04/69	None	Charles Rudd	-	As per original submission	Unclear	Reject	Further Submissions not already assessed
FS04/70	FS04/70	04/12	Gwyneth Schibli	Support	Proposed route is too short to be effective and reliant	Move cycleways to perimeter of Tara-lka north, east, and	Reject	Transport

					on a single landowner to develop	west boundaries to give access to Gladstone Road and cycle trails		
FS04/71	FS04/71	04/14	Gwyneth Schibli	Support and Oppose	Agree with submissions 04/09, 04/10, 04/11, 04/18, 04/16, 04/20, 04/22, 04/23 regarding residential zoning. Disagree with Redwood Grove submission 04/31 that current use will not change, zoning should allow future flexibility. Disagree with submission 04/37 as denser housing does not create crime	Densify class 3 land to protect class 1 and 2	Accept in part	Well Functioning Urban Environments
FS04/72	FS04/72	04/15	Gwyneth Schibli	Support	Support 04/34 that HDC should make use of basket style sump technology to improve technology. Support 04/38 as it is useless placing wetland at the end of the problem. Need to be slowed efficiently so all methods available need to be considered for holding water tanks, sumps and east/west seepage.	Allow the submission	Reject	Infrastructure
FS04/73	FS04/73	None	Vivienne Gwentyth Bold	-	Three waters planning and transport planning insufficient	Unclear	Reject	Further Submissions

								not already assessed
FS04/74	FS04/74.01	04/24.01	Prouse Trust Partnership	Support	Support the submission to ensure the developer only has to pay for their own needed infrastructure so it is fair	We seek the submitters request be allowed to ensure the developer only has to pay for the infrastructure needed for their own development	Reject	Infrastructure
FS04/74	FS04/74.02	04/24.02	Prouse Trust Partnership	Support	Support submitters objective to recognise the protection of cultural sites so Prouse Homestead is protected	We seek the submitters request be allowed to ensure the three key sites identified by the submitter are protected from inappropriate impact	Accept in part	Culture and Heritage
FS04/75	FS04/75	04/31	Prouse Trust Partnership	Oppose	Strongly oppose request that Redwood Grove and adjoining properties be zoned low density and subject to a special buffer changing the minimum site area to 2000m2 as this places unreasonable limits on neighbouring properties	That the submitters request be disallowed	Accept	Well Functioning Urban Environments
FS04/76	FS04/76	04/32	John and Jeny Brown	Support	Agree a review of the medium density standard is needed	Review standards with a design led approach	Reject	Well Functioning Urban Environments

FS04/77	FS04/77	04/08	John and Jeny Brown	Support	Protect LUC 1 and 2 by utilising lower LUC land for development	Higher density zoning in Tara-Ika to protect land outside of Tara-Ika	Accept in part	Well Functioning Urban Environments
FS04/78	FS04/78.01	04/38	John and Jeny Brown	Support	Support comments about protecting cultural, heritage and ecological values.	None clear	Accept in part	Culture and Heritage
FS04/78	FS04/78.02	04/38	John and Jeny Brown	Support	Support comments about how growth funding is addressed to ensure costs are distributed equitably	None clear	Reject	Non-RMA Matters
FS04/78	FS04/78.03	04/38	John and Jeny Brown	Support	Support comments that there should be rates relief when zoning changes for rural to residential	Provide clarification on rates relief and how this could facilitate development	Reject	Non-RMA Matters
FS04/79	FS04/79	04/27	John and Jeny Brown	Support	Support comments from original submitter that both land owners and iwi should be involved in street naming to reflect history and diversity	Involve land owners and iwi in street naming	Accept in part	Culture and Heritage
FS04/80	FS04/80	04/24	John and Jeny Brown	Support	Support comments that approach proposed may have a burden on some landowners without compensation. A consistent developer/council funding model should be developed	Remove Rule 15A.6.1(a) and amend policy 6A.1.1	Reject	Infrastructure

FS04/81	FS04/81	04/23	John and Jeny Brown	Support	Support comments that low density land should be changed to standard density as this will make development for economically viable and better align with national policy outcomes	Up zone low density land to standard density	Accept in part	Well Functioning Urban Environments
FS04/82	FS04/82	04/20	John and Jeny Brown	Support	Effectively manage productive land by ensuring land is not wasted on low density and greenbelt residential zoning	None clear	Accept in part	Well Functioning Urban Environments
FS04/83	FS04/83	04/19	John and Jeny Brown	Oppose	While the points raised are valid, we have a housing shortage. If housing is not planned in a controlled manner there will be a greater wastage of productive class 1 and 2	None clear	Accept in part	Whole Plan Change and General Matters
FS04/84	FS04/84.01	04/07	John and Jeny Brown	Support	Support no subdivision on class 1 and 2 soils	Allow the submission	Accept in part	Natural Environment and Sustainability Matters
FS04/84	FS04/84.02	04/07	John and Jeny Brown	Support	Support comments on stormwater	Allow the submission	Accept in part	Infrastructure
FS04/85	FS04/85	04/18	John and Jeny Brown	Oppose	Disagree that greenspaces and education provision should be used to buffer between Redwood Grove and disagree arterial road	None clear	Accept	Well Functioning Urban Environments

					should be moved because the intention for Tara-Ika is to serve the Horowhenua community growth now and for future generations.			
FS04/86	FS04/86	04/07	John and Jeny Brown	Support	Maximise the use LUC 1 and 2 to protect LUC 3. This can only be achieved by medium to high density housing	Review the stormwater systems and management currently in place to ensure it is properly managed	Accept in part	Well Functioning Urban Environments
FS04/87	FS04/87	04/08	Gwen Bailey	Oppose	Supports original plan, opposes submissions requesting zoning that would make all sections smaller. Variety is needed, so people stay in the area.	Retain original zoning	Accept in part	Well Functioning Urban Environments
FS04/88	FS04/88	04/08	Rebecca & Andrew Collis	Oppose	Oppose submissions requesting smaller section sizes in greenbelt residential area. Land adjoining greenbelt residential should be no smaller than existing development to protect mental health and wellbeing of those already living in the area	Land adjoining Greenbelt Residential to have same section sizes as adjoining areas.	Accept in part	Well Functioning Urban Environments
FS04/89	FS04/89	04/22	Gillian Morgan	Support	Oppose greenbelt/low density zoning on basis that this is not an efficient use of land. Seeks	Residential Zoning	Accept in part	Well Functioning Urban Environments

					residential zoning. Seeks protection of the Waiopēhu Reserve. Rates impact			
FS04/90	FS04/90.10	04/25	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.01	04/33	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.02	04/09	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.03	04/10	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.04	04/11	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.05	04/15	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.06	04/18	Waka Kotahi	Oppose	Outcomes sought in submission would be	None clear	Accept in part	Further Submissions

					inconsistent with WKNZTA submission requests			not already assessed
FS04/90	FS04/90.07	04/20	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.08	04/22	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.09	04/23	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.11	04/27	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/90	FS04/90.12	04/24	Waka Kotahi	Oppose	Outcomes sought in submission would be inconsistent with WKNZTA submission requests	None clear	Accept in part	Further Submissions not already assessed
FS04/91	FS04/91.01	04/06	Haddon Preston	Support in part	Support in part the request from the submitter to consider the effect of prohibiting access from collector roads	Remove rule 15A.6.1.1(a) and insert a policy under 6A.1.1 which encourages access from rear lanes	Reject	Transport
FS04/91	FS04/91.02	04/07	Haddon Preston	Support in part	Support in part the request to require rainwater harvesting	Allow submission	Accept in part	Infrastructure

FS04/91	FS04/91.03	04/13	Haddon Preston	Support in part	Support in part the request to require rainwater harvesting	Stormwater must be dealt with onsite. Each development should show stormwater will be hydrologically neutral	Accept in part	Infrastructure
FS04/91	FS04/91.04	04/15	Haddon Preston	Support in part	Support in part the request to require rainwater harvesting	Stormwater must be dealt with onsite. Each development should show stormwater will be hydrologically neutral	Discuss	Infrastructure
FS04/91	FS04/91.05	04/09	Haddon Preston	Support in part	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments
FS04/91	FS04/91.06	04/10	Haddon Preston	Support in part	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments
FS04/91	FS04/91.07	04/11	Haddon Preston	Support in part	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments
FS04/91	FS04/91.08	04/14	Haddon Preston	Support in part	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments

FS04/91	FS04/91.09	04/20	Haddon Preston	Support in part	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments
FS04/91	FS04/91.10	04/25	Haddon Preston	Support	Fully support request to modify rules as described	As described by submitter	Accept in part	Further Submissions not already assessed
FS04/91	FS04/91.11	04/33	Haddon Preston	Support	Fully support request to modify rules as described	As described by submitter	Reject	Transport
FS04/91	FS04/91.11	04/27	Haddon Preston	Support	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments
FS04/91	FS04/91.12	04/28	Haddon Preston	Support	support in part the request from the submitter to collaborate with the Council to underground powerlines as the opportunity arises	All parties work together in good faith to underground lines which run through Tara-Ika and formulate a rule to address this matter	Accept in part	Infrastructure
FS04/91	FS04/91.13	04/38	Haddon Preston	Support	Fully support request to modify rules as described	As described by submitter	Accept in part	Further Submissions not already assessed
FS04/91	FS04/91.14	04/32	Haddon Preston	Support	Fully support request to modify rules as described	As described by submitter	Accept in part	Further Submissions not already assessed

FS04/91	FS04/91.15	04/25	Haddon Preston	Support in part	Support in part requests to remove low density overlays from residential land	Remove low density overlays	Accept in part	Well Functioning Urban Environments
FS04/92	FS04/92	04/22	Gillian Morgan	Support	Oppose greenbelt/low density zoning on basis that this is not an efficient use of land. Seeks residential zoning. Seeks protection of the Waiopēhu Reserve. Rates impact	Residential Zoning	Accept in part	Well Functioning Urban Environments
FS04/93	FS04/93	04/35	Lake Horowhenua Trust	Support	Support original submitters comments regarding stormwater and Lake Horowhenua	None clear	Accept in part	Infrastructure
FS04/94	FS04/94.01	04/25	Kevin Daly	Support	Support proposed zoning change	Accept submission	Accept in part	Well Functioning Urban Environments
FS04/94	FS04/94.02	04/30	Kevin Daly	Neutral	Outlines no history of flooding on property, which has been owned by family since 1963	None clear	Accept in part	Infrastructure
FS04/94	FS04/94.03	04/34	Kevin Daly	Oppose	Oppose requests to extent the corridor by extra 100m	Reject submission	Accept in part	O2NL Impact, Interface, and Timing
FS04/95	FS04/95.01	04/07	John and Jeny Brown	Support in part	Maximise the use LUC 3 to protect LUC 1 and LUC 3. This can only be achieved	Remove low density and replace with standard	Accept in part	Well Functioning Urban Environments

					by medium to high density housing			
FS04/95	FS05/95.02	04/07	John and Jeny Brown	Support in part	Review stormwater systems and management to deal with increase in runoff. Already impacted by stormwater runoff from Pohutukawa Drive	Address stormwater	Accept in part	Infrastructure

Appendix 2: Proposed Plan Chapters (Chapter 6A Objectives and Policies: Tara-Ika Multi-Zone Precinct and Chapter 15A Rules: Tara-Ika Multi-Zone Precinct), with recommended changes annotated

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

6A. ~~TARA~~IKATARA-IKA MULTI ZONE PRECINCT

The following objectives and policies are to be read in conjunction with the objectives and policies contained within Chapters 1-14 of the Horowhenua District Plan. In the event there is conflict between the objectives and policies in this chapter and those contained within the remainder of the District Plan, the objectives and policies contained within this chapter (Chapter 6A – ~~Taraika~~Tara-Ika) shall apply.

~~Taraika~~Tara-Ika is a large greenfield site located to the east of the existing urban area of Levin, with the Tararua Ranges forming an impressive backdrop to the area.

Muaūpoko have a very strong and enduring relationship with the Tara-Ika area, as it is an area where they have worked, cultivated, hunted and gathered resources for over 1000 years. Tara-Ika sits between areas of high cultural association to Muaūpoko, including Punahau (Lake Horowhenua) and the Tararua Ranges, and is therefore part of important physical, ecological, visual and spiritual pathways.

The ~~Taraika~~Tara-Ika Development Area (~~Taraika~~Tara-Ika) totals 470ha and has been master planned to provide a range of housing options and other supportive non-residential activities such as commercial and education activities. The area is expected to accommodate approximately ~~3,500~~2,500 residential dwellings and will be home to more than 5,000 people. Some of the surrounding environment has already been developed for rural lifestyle purposes.

The land has been identified as a growth area for the Horowhenua District since the Horowhenua Development Plan was prepared in 2008. The land was subsequently rezoned to Greenbelt Residential Deferred with an associated Structure Plan to guide development introduced to the District Plan. Since this time, growth projections for the District have changed significantly with the District's population now expected to grow rapidly. This prompted the decision to consider ~~Taraika~~Tara-Ika for a greater density of development than what could occur under a Greenbelt Residential Zoning.

~~Taraika~~Tara-Ika was considered suitable for additional residential capacity due to a range of factors including:

- The site is very flat and relatively unconstrained in term of risk from natural hazards;
- The site is close to the existing urban area of Levin;
- The site has already been identified as a growth area and has had a level of rural lifestyle development occur under the existing zoning. As such, additional development in this area does not result in a significant loss of rural production land.

As such, the area has been master planned and the land consequently rezoned to enable a variety of different residential and non-residential activities to establish.

~~Taraika~~Tara-Ika is made up of the following zones:

- Commercial Zone (~~Taraika~~Tara-Ika Precinct)
- Open Space Zone (~~Taraika~~Tara-Ika Precinct)
- Residential Zone (~~Taraika~~Tara-Ika Precinct)
- Greenbelt Zone (~~Taraika~~Tara-Ika Precinct)

Each zone has individual objectives, policies, and rules to ensure development achieves the desired objectives and principles for the area. There are also objectives and policies that apply to all zones within ~~Taraika~~Tara-Ika. In addition, the relevant objectives, policies and rules from the existing District Plan chapters and zones will apply. In the case where there are duplicate

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

provisions, the more specific provision (i.e. TaraikaTara-Ika specific provisions) will apply in place of the more general provisions.

Please note that the Horizons Regional Council One Plan also regulates a number of activities associated with subdivision and land development, including but not limited to earthworks, vegetation clearance, and activities near streams with food production value. Plan users are advised to refer to the One Plan for further information.

ISSUE 6A.1 OVERALL PRINCIPLES FOR DEVELOPMENT IN TARA-IKA

Through the Horowhenua Growth Strategy 2040, Council identified that the existing zoning and structure plan for the area previously known just as 'Gladstone Green' was unlikely to accommodate the level of growth anticipated in the District, or deliver the outcomes desired for the area. Furthermore, the resource consent process was considered unlikely to provide sufficient opportunity to deliver an integrated and co-ordinated development at the scale anticipated. As a result, the TaraikaTara-Ika Master Plan was prepared in order to guide and enable residential and other development to ensure that this happens in an integrated and co-ordinated way. This master plan is the basis of the Structure Plan 013 and the following objectives and policies.

ISSUE DISCUSSION

TaraikaTara-Ika is anticipated to become high amenity residential development. However, there is also a risk development could adversely affect the environmental quality and cultural values of the area due to effects arising from increased built form, traffic, and demand for infrastructure and services and pressure on eco-systems.

State Highway 57 separates TaraikaTara-Ika from the rest of the urban area of Levin. The preferred corridor for the Otaki to North of Levin highway is also located in TaraikaTara-Ika (near to existing State Highway 57), creating a risk of severance between TaraikaTara-Ika and the rest of Levin.

Due to the alignment of future and existing state highways, there is a risk that TaraikaTara-Ika will develop in way that is disconnected from the urban area of Levin and associated services. Unless addressed, this will have a negative impact on the amenity of the resulting development and the well-being of residents.

As a large greenfield site, TaraikaTara-Ika represents a 'blank' canvas. This presents an opportunity to establish a unique character. However, this also means there is no existing pattern of urban development to follow (for example, lot design and layout, street trees and provision for open space). Without an established urban pattern from adjoining areas to replicate, there is a risk that an incoherent urban form and disconnected structure will follow. This could result inadequate dwelling interaction with the street, adhoc section sizes that affects character and amenity, or establishment of a commercial area in an inappropriate location. It is also possible that future development will not sufficiently consider or prioritise the amenity or functionality of the public realm, resulting in poor quality urban form, inadequate or inappropriate use of street trees and a lack of quality, functional reserve space. The master plan seeks to respond to these risks.

Master planned greenfield development at TaraikaTara-Ika therefore presents an opportunity to achieve the following:

- a connected and integrated future-proof development that represents good urban design and provides a high level of residential amenity;

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

- encourages a variety in housing choice, including higher density options;
- a development that utilises low impact, sustainable servicing solutions and encourages walking and cycling;
- a development which provides facilities and open space to meet the needs of the community;
- a development that maintains and enhances cultural, heritage, and ecological values of the area.

To achieve the above, it is important that subdivision, development, and land use activities are coordinated to occur in locations and at densities that enable sustainable and efficient use of land and delivery of infrastructure and contribute to a high amenity environment.

It is also important that development at TaraikaTara-Ika is resilient to the effects of climate change and natural hazards and minimises effects on the natural environment. Both of these considerations require careful stormwater design.

The following objectives and policies seek to respond to the above issue and opportunity.

Objectives & Policies

Objective 6A.1

To achieve an integrated and connected development that reflects cultural values and local identity, represents good urban design, is supported by a well connected roading network that supports a range of transport modes and has the facilities, social infrastructure, infrastructure, and amenities necessary to contribute to the health, safety, and wellbeing of residents. This includes:

- Encourage housing at a range of densities;
- Provision for a local-scale commercial centre;
- Access to quality public open space;
- Safe and efficient walking and cycling options;
- Well connected, safe and efficient roading network;
- Design that reflects Muaūpoko cultural values and local history and identity;
- Protection of culturally significant sites;
- Environmentally sensitive design;
- Encouraging subdivision and development design to enable energy efficiency and reduced energy consumption;
- Within the Arapaepae Road Special Treatment Overlay, development that is appropriate for the site in terms of scale, access, and compatibility with surrounding land uses.

Policy 6A.1.1

Subdivision, infrastructure and land development in TaraikaTara-Ika must be consistent with Structure Plan 013. Subdivision and land development that deviates from the current or future implementation of the Structure Plan will only be considered where an alternative is proposed that will achieve the following:

- The same or similar level of connectivity within TaraikaTara-Ika;
- The same or similar level of connectivity between the TaraikaTara-Ika and the existing urban area of Levin;

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

- Protection of opportunities for land adjacent to ~~Taraika~~Tara-Ika to be connected to ~~Taraika~~Tara-Ika in the future;
- Public recreation space of an equivalent functionality as that shown on the Structure Plan and that is within walking distance of a similar number of properties as shown on the Structure Plan;
- A streetscape that maintains an appropriate expression of street hierarchy and consistency of treatment along any arterial or collector street;

Policy 6A.1.2

Subdivision, ~~and~~ land development and open space reserves in ~~Taraika~~Tara-Ika will acknowledge, protect, and celebrate ~~cultural values, cultural history~~Muaūpoko values and history and local identity in the following ways:

- Use of both ~~Māori~~Muaūpoko ~~and non-Māori~~ names, among others, for streets and reserves;
- Protection of culturally significant sites;
- Prioritise use of locally sourced indigenous plants in street and reserve planting;
- Muaūpoko Accidental Discovery and Tikanga Protocol observed during site works.

Policy 6A.1.3

Require development to be designed in a manner that enables passive surveillance of public places (such as parks and roads) from private properties using techniques such as good site layout, restricting fence heights, and landscape treatments that will not obscure key sightlines.

Policy 6A.1.4

Provide for non-residential activities, such as community, recreational, educational and commercial activities, which support the day to day needs of the local community, while avoiding any such non-residential activities of a nature and scale that compete with the Levin Town Centre.

Policy 6A.1.5

Require subdivision layout to ensure street design enables the safe and efficient movement of people, ~~and~~ traffic and public transport, provides a high level of safety and amenity for pedestrians and cyclists, and contributes positively to the public realm.

Policy 6A.1.6

Encourage additional building height where this would contribute to a well-functioning urban environment (for example, increased housing variety), so long as reasonable privacy of neighbouring dwellings is maintained, culturally important views are maintained along Queen Street East and visual dominance and excessive shading beyond the subject site are avoided.

Policy 6A.1.7

Provide for a range of land uses within the Arapaepae Road Special Treatment Overlay to allow flexibility to deliver a context specific response that recognises both the unique attributes

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

of the site and the need to appropriately manage adverse effects, including safe and efficient access and avoiding or minimising reverse sensitivity effects.

Policy 6A.1.8

Require subdivision layout that will enable buildings to utilise energy efficiency and conservation measures.

Objective 6A.2

Efficient delivery of infrastructure within ~~Taraika~~Tara-Ika will enable development while protecting environmental and cultural values and achieving a high level of residential amenity.

Policy 6A2.1

Make provision within ~~the Taraika~~Tara-Ika for housing yield of ~~2,500-3,000~~at least 3,500 houses.

Policy 6A2.2

Require subdivision and development to be managed, designed and staged to align with the coordinated provision and upgrading of the infrastructure network (including roading network), public open space, streetscape and local service facilities within the ~~Taraika~~Tara-Ika, as illustrated on Structure Plan 013.

Policy 6A2.3

Avoid subdivision and development that compromises the ability to provide efficient and effective infrastructure networks for the wider ~~Taraika~~Tara-Ika.

Objective 6A.3

Stormwater management in ~~Taraika~~Tara-Ika will be resilient, culturally sensitive and environmentally sustainable, including:

- Resilient to natural hazards and the likely effects of climate change;
- Incorporating Water ~~s~~Sensitive design~~Design~~;
- Minimise adverse effects from changes in the nature (including quality and quantity) of natural flows on downstream ecosystems;
- Avoiding natural areas and ecosystems that are sensitive to modifications to changes in groundwater and surface water levels and flows-

Policy 6A.3.1

Require an integrated approach to managing stormwater from ~~Taraika~~Tara-Ika to ensure the quality and quantity of runoff does not have an adverse effect on Punahau (Lake Horowhenua), the Koputaroa Stream, or other downstream environments.-

Policy 6A.3.2

Require stormwater to be retained and disposed of within the Tara-Ika Growth Area for up to a 1 in 100 year annual return interval rainfall event (with allowance for climate change), and treated and managed utilising the best practicable option to mitigate the effects of stormwater by including the following:

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

- (i) limiting the extent of impervious areas;
- (ii) incorporating on-site treatment and disposal of stormwater into subdivision and development design;
- (iii) provision of catchment-wide facilities like wetlands and basins that are efficient and effective from both a construction and maintenance perspective and avoid culturally significant sites.

Policy 6A.3.32

Recognise te mana o te wai and the significance to Muaūpoko Kaitiakitanga iwi of to the Taraika Tara-Ika environment and its connection to Punahau (Lake Horowhenua) by working with iwi-Muaūpoko to protect the mauri of freshwater through manage-managing stormwater quality and quantity.

Policy 6A.3.43

Require rainwater collection tanks to be provided on all new residential allotments to capture and reuse runoff to mimic, as much as practicable, pre-developed hydrological conditions for the site and promote sustainable use of freshwater resources.

Explanation and Principal Reasons

Large scale greenfield development has the potential to lead to adverse environmental outcomes, particularly when the land is owned by multiple different parties. Without a strong framework to guide growth and development in this area, there is potential for individual subdivisions to progress in a fragmented and disconnected manner. Furthermore, there is a risk that no individual application will make provision for facilities such as open space, supportive commercial activities, or educational activities. Further, individual subdivision applications progressing in an adhoc manner are likely to result in inefficient delivery of infrastructure and limit opportunities for connectivity.

The Structure Plan for the Taraika Tara-Ika is based on the Taraika Tara-Ika Master Plan. It provides a comprehensive framework to manage growth and development in the Taraika Tara-Ika, including infrastructure, roads and open space. Subdivision and development is required to be undertaken in accordance with the Structure Plan to ensure efficient use of the land and physical resources. It is important the principles of this Structure Plan are adhered to in order to achieve the development outcomes anticipated for this area.

Ensuring subdivision and development is aligned with the Structure Plan will help to deliver a quality living environment that is supported by necessary non-residential activities, amenities, and services.

It is also important to recognise cultural history and identity in this area. One way to achieve this is to ensure that streets and reserve names include Māori names chosen by Tangata Whenua.

ISSUE 6A.2 RESIDENTIAL ZONES (TARA-IKA TARA-IKA PRECINCT)

The character of the Residential Zone of Taraika Tara-Ika is likely to be different to the wider Levin area due to the era of development, housing density expected, integrated master planning approach to development, and the detail of the design principles identified for this area.

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

It is important ~~Taraika~~Tara-Ika complements and integrates with the existing residential areas of Levin while providing a different offering (for example, more housing variety).

ISSUE DISCUSSION

The ~~Taraika~~Tara-Ika residential area needs to develop in a manner that reflects good urban design and form to achieve a high amenity living environment that contributes to the wellbeing of its residents.

At present, there is limited variation in residential housing types available within the District. The predominant housing type available is 'family sized' standalone dwellings on relatively large residential sections, ranging from 400m²-800m². However, this uniformity of housing type does not fully satisfy the diverse needs of the Horowhenua community. ~~Taraika~~Tara-Ika offers an opportunity to respond to this by encouraging more variety and improving housing affordability and small lots suitable for smaller dwellings. The following objectives and policies seek to respond to this.

Objectives & Policies

Objective 6A.4

Achieve a high amenity, connected, walkable residential environment with a range of section sizes and housing types, including affordable housing options, in ~~Taraika~~Tara-Ika.

Policy 6A.4.1

Optimise walkability and encourage choice and a variety of housing types, by providing for higher density residential development near to commercial and community facilities and lower density residential development at the outer edge of ~~Taraika~~Tara-Ika.

Policy 6A.4.2

Enable and encourage a range of housing types and section sizes in ~~Taraika~~Tara-Ika to meet the variety of needs and preferences in our community, while ensuring a high level of residential amenity and connectivity.

Policy 6A.4.3

Use both minimum and maximum density standards to encourage housing variety and to ensure development occurs at a scale and density consistent with the amenity expected for that particular area.

Explanation and Principal Reasons

Management of the residential environment generally focuses on providing for ongoing use and development in a way that maintains and enhances their character and amenity values. In the case of ~~Taraika~~Tara-Ika, the early stages of development will not have an established residential character or amenity to be informed by. Both the ~~Taraika~~Tara-Ika Master Plan and Structure Plan 013 outline some of the characteristics of urban form and design that will lead to the creation of a residential character and amenity that is considered appropriate within this particular context. The above objectives and policies, supported by District Plan rules, seek to achieve these outcomes to build and establish a high amenity residential character for

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

~~Taraika~~ Tara-Ika.

ISSUE 6A.3 COMMERCIAL ZONE (~~TARA-IKA~~ TARA-IKA PRECINCT)

Given the anticipated population of ~~Taraika~~ Tara-Ika and the proximity of ~~Taraika~~ Tara-Ika to existing residential areas on the eastern side of Levin, the area will likely be supported by a commercial centre in the future. It is important that this is located in the appropriate location to maximise accessibility for the community served, support viability and consequently maximise the benefits this will offer the community. In addition, it is important that the nature and scale of this centre is controlled so as to ensure it offers a high amenity 'focal point' for the community, while not conflicting with the existing Levin town centre.

Issue Discussion

It is important that commercial development in ~~Taraika~~ Tara-Ika agglomerates in a highly accessible, central location. If commercial activities and community services establish in an adhoc or sprawling manner, the vibrancy and vitality of the neighbourhood centre will be reduced, limiting the opportunity for it to act as a central point for the community.

The commercial centre will provide an important service to the community, through meeting the daily or weekly needs of the local catchment. This can reduce the need to travel across town and improves the overall experience of living within an area that, due to the distance from the commercial area of Levin and the presence of a State Highway (State Highway 57 in the short term and the Otaki to North of Levin highway in the longer term), would otherwise be underserved by convenience facilities.

The design and layout of commercial development is important to ensuring a vibrant and attractive centre that the community will want to spend time in. Important considerations include the design of building frontages and the location of carparks. An attractive commercial centre that demonstrates good urban design can also support other types of land uses. This is because quality commercial development can act as an 'attractor' for land uses such as medium density development. This is considered an important relationship to acknowledge and enhance in order to encourage housing variety, as well as to achieve an attractive commercial centre.

In addition to the above, it is important that the ~~Taraika~~ Tara-Ika commercial centre does not compete with the Levin town centre, particularly given the proximity of the ~~Taraika~~ Tara-Ika commercial centre to both existing and proposed State Highways. Therefore, it is important that the nature and scale of this centre is controlled in order to protect the primacy of the Levin town centre.

Objectives & Policies

Objective 6A.5

Encourage development of a sustainable and attractive local commercial centre that accommodates a variety of compatible land use activities, while protecting the vitality of the Levin Town Centre.

6A OBJECTIVES/POLICIES: TARA-IKA MULTI-ZONE PRECINCT

Policy 6A.5.1

Provide for supermarket and/or convenience retail facilities at a scale suitable for the area.

Policy 6A.5.2

Provide for service based commercial activities that support the daily or weekly needs of the local community, so long as nature and scale does not compete with the Levin Town Centre.

Policy 6A.5.3

Ensure of the design, nature, and scale of commercial activities contributes positively to the image and overall amenity of the commercial area of Taraika Tara-Ika.

Policy 6A.5.4

Ensure the development in the commercial zone contributes positively to the amenity of public places (including footpaths and roads) by:

- (a) avoiding blank walls facing the roads;
- (b) providing level access for pedestrians into shops;
- (c) ensuring fascia boards and associated signage are of a consistent size and height;
- (d) avoiding freestanding signs;
- (e) maximising outlook onto streets and public places;
- (f) providing weather protection for pedestrians along the road frontages;
- (g) providing service access, car parking and staff parking away from the frontages;

Policy 6A.5.5

Avoid establishing commercial activities that are of a nature and scale that would detract from the vibrancy and vitality of the Levin Town Centre. Examples of such activities include but are not limited to entertainment activities, hotel/motel accommodation, large format retail and other activities of a type and scale that will compete with the Levin Town Centre.

Explanation and Principal Reasons

Given the anticipated population of Taraika Tara-Ika, it is both likely and desirable for a range of small scale commercial activities to establish.

Commercial centres fulfil both a functional need for residents, thus reducing their need to travel into Levin or other surrounding areas to meet their daily and weekly convenience needs and provide a focal point for the community. This is important as it provides a place for people to meet and interact with both their neighbours and the wider community. This contributes to feelings of safety, social connectedness and wellbeing, which ultimately improves the overall quality and amenity of the surrounding residential environment. However, it is important that the commercial area of Taraika Tara-Ika does not compete with the vibrancy and vitality of the Levin Town Centre.

In order to achieve these outcomes, the above objectives and policies (and supporting rules in Chapter 15A of the District Plan) seek to control the design of signs and buildings and the nature and scale of residential activities in ensure a high amenity environment that encourages walking, cycling through quality of experience. Controls on the scale and nature of commercial activities allowed to establish within Taraika Tara-Ika will also avoid conflict with adjoining land uses and ensure that Levin's town centre remains the primary commercial centre in the

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District.

ISSUE 6A.4 OPEN SPACE ZONE (~~TARA~~IKATARA-IKA PRECINCT)

ISSUE DISCUSSION

Given the size of ~~Taraika~~Tara-Ika and the number of lots it will accommodate, the development will require open space provision. It is important that the reserve space is provided in the appropriate location and that it is of a functional size and shape.

Objectives & Policies

Objective 6A.6

To provide high quality public open space that is accessible and can be used for a variety of purposes, including stormwater management.

Policy 6A.6.1

Ensure public parks or reserves are distributed through ~~Taraika~~Tara-Ika to be easily accessible to all residential lots by requiring all subdivision and development to comply with Structure Plan 013.

Policy 6A.6.2

Ensure public parks and reserves are of a size, shape and type that enables ~~a~~functional ~~and~~ recreational uses by requiring all subdivision and development to comply with Structure Plan 013.

Policy 6A.6.2

Require public parks and reserves to recognise and celebrate Muaūpoko history and values through design, naming, and use of planting.

Policy 6A.6.~~4~~3

Enable education facilities to establish at a scale that supports the needs of the local community, ~~with limits on scale to protect the amenity of the surrounding environment.~~

Explanation and Principal Reasons

Open space that can be used for a range of recreational purposes is an important asset for both the wider community and the ~~Taraika~~Tara-Ika community. Furthermore, recreation space contributes positively to residential amenity. In addition, recreation space provides opportunity to manage stormwater during heavy rain events and to contributes to the ecology of an area.

It is important that ~~Taraika~~Tara-Ika is serviced by quality reserve space. As a large greenfield site, there is opportunity to secure land for recreation space early in the land development process, to ensure it is functional, accessible, and of high amenity. The above objectives and

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policies (and supporting rules in Chapter 15A of the District Plan) seek to secure this outcome.

Methods for Issues and Objectives in TaraikaTara-Ika

District Plan

- A range of zones, supported by a 'TaraikaTara-Ika Precinct', will be identified on the planning maps.
- TaraikaTara-Ika precinct specific rules will be applied, in addition to general zoning rules, to specify how subdivision and development will be managed in order to achieve the above objectives and policies.
- A structure plan will guide subdivision and development in the TaraikaTara-Ika area in order to achieve the above objectives and policies.
- The resource consent process will provide opportunity for appropriate subdivision and development proposals that are not permitted, either because of non-compliance with environmental standards or because of the nature of the non-residential land uses.
- Conditions on resource consents will control the effects of subdivision and development.

Standards expressed as District Plan rules are considered to be the most appropriate and effective method of maintaining minimum standards for the matters over which the Council has jurisdiction. Rules provide certainty for resource users and for neighbours which is important for community understanding of what environmental quality is expected. The use of a Design Guide is effective in providing guidance on the matters and outcomes for achieving quality medium density developments.

TaraikaTara-Ika Master Plan

The TaraikaTara-Ika Master Plan formed the basis of the above objectives and policies and Structure Plan. The Master Plan provides further detail, assessment, and information that justify the outcomes sought for the TaraikaTara-Ika area.

Long Term Plan/Annual Plan

- Council will undertake amenity improvement work including street planting and traffic management schemes within residential areas. Council will co-ordinate the provision of appropriate infrastructure to support residential development.
- Council will continue to maintain the landscape of streets (berms and sealed surfaces) and areas of public open space throughout the settlements.
- Council will require developers to contribute to the costs of new infrastructure and upgrading, reserves provision, community and recreational facilities and amenity improvements in residential areas.
- Council will require developers to contribute to the costs of new infrastructure and upgrading, reserves provision, community and recreational facilities and amenity improvements through its Development Contributions Policy.

There are a range of non-District Plan methods available to promote a good standard of residential design and development, particularly through the use of Codes and Guidelines, and through Council funded initiatives for community and residential amenities. Development Contributions from residential development will be used in the upgrading and

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expansion of the District's roads, reserves and other civic amenities and facilities.

Other

- The use of private developer agreements to facilitate infrastructure works
- Engagement with Muaūpoko
- Council will work with ~~iw~~Muaūpoko, particularly in regard to stormwater design, reserve design, planting, and street and reserve naming.
- Contractors will be briefed on the tikanga requirements.
- Council and Muaūpoko will co-design an Open Space Design Guide which will include guidance on how to integrate and provide for Muaūpoko relationships and values within Tara-Ika.

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15A. ~~TARA~~IKATARA-IKA MULTI-ZONE PRECINCT

A 'multi-zone precinct' is a tool set out in the National Planning Standards. The National Planning Standards define a 'precinct' as follows:

A precinct spatially identifies and manages an area where additional place-based provisions apply to modify or refine aspects of the policy approach or outcomes anticipated in the underlying zone(s).

~~Taraika~~ ~~Tara~~-Ika contains a number of different zones, including Residential, Greenbelt Residential, Open Space, and Commercial. The majority of the current rules and standards contained within these existing zone will apply within ~~Taraika~~ ~~Tara~~-Ika. However, there are some instances where different rules and standards will be required within ~~Taraika~~ ~~Tara~~-Ika. Therefore, the respective zone chapter provisions will apply within ~~Taraika~~ ~~Tara~~-Ika, except as modified by the provisions contained within Chapter 15A. If there is conflict between chapters, the provisions of Chapter 15A will override.

15A.1 PERMITTED ACTIVITIES

The following activities are permitted activities provided activities comply with all relevant conditions in Rule 15A.6 and Chapters 21, 22, 23 and 24.

Note: The permitted activity conditions within the relevant zone chapter for the relevant activity type also apply. Where there is conflict between provisions, the more specific provision (i.e. the provisions of this chapter) apply.

15A.1.1 All Zones

15A.1.1.1 Activities permitted by the underlying zone chapters

- (a) Within the Residential Zone of the ~~Taraika~~ ~~Tara~~-Ika Precinct, activities listed as a permitted activity in Chapter 15 are a permitted activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Greenbelt Residential Zone of the ~~Taraika~~ ~~Tara~~-Ika Precinct, activities listed as a permitted activity in Chapter 18 are a permitted activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (c) Within the Open Space Zone of the ~~Taraika~~ ~~Tara~~-Ika Precinct, activities listed as a permitted activity in Chapter 20 are a permitted activity, provided activities comply with all relevant conditions contained within Chapter 20.

15A.1.2 Commercial Zone

In the Commercial Zone, the only permitted activities are:

- (a) Commercial (excluding entertainment activities) occupying a floor area of up to 250m²

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- (b) Retail occupying a floor area of up to 250m²
- (c) Community activities
- (d) Recreation facilities
- (e) Public conveniences
- (f) Open space
- (g) Residential activities above ground floor (i.e. 1st floor or above), or at ground level only where the residential activity does not directly front onto the road boundary (i.e. they are located to the rear of a commercial activity).
- (h) The following types of signs
 - (i) Advertising signs, including public facility or information signs identifying a building, property or business.
 - (ii) Official signs.
 - (iii) Temporary signs.
 - (iv) Signs advertising sale or auction of land or premises.
 - (v) Health and safety signs.
- (i) The following network utilities and energy activities:
 - (i) The construction, operation, maintenance and upgrading of network utilities.
 - (ii) Domestic scale renewable energy devices.
- (j) Temporary activities

15A.2 CONTROLLED ACTIVITIES

The following activities are controlled activities provided activities comply with all relevant conditions in Rules 15A.6 and Chapters 21, 22, 23 and 24. In addition, refer to the relevant zone chapters for matters of control and conditions for controlled activities:

Note: The matters of control contained within the relevant zone chapter for the relevant activity type also apply.

15A.2.1 All Zones

- (a) Within the Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a controlled activity in Chapter 15 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Commercial Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a controlled activity in Chapter 17 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 17.

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- (c) Within the Greenbelt Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a controlled activity in Chapter 18 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (d) Within the Open Space Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a controlled activity in Chapter 20 are a controlled activity, provided activities comply with all relevant conditions contained within Chapter 20.

15A.3 RESTRICTED DISCRETIONARY ACTIVITIES

The following activities are restricted discretionary activities provided activities comply with all relevant conditions in Rule 15A.7. Refer to Rules ~~15A.8.2~~15A.8.1, ~~15A.8.3~~15A.8.2 and ~~15A.8.4~~15A.8.3 for matters of discretion and conditions for restricted discretionary activities.

Note: The matters of discretion and conditions for restricted discretionary activities contained within the relevant zone chapter for the relevant activity type also apply.

Note: Refer to Chapter 25 for Assessment Criteria as a guide for preparing an assessment of environmental effects to accompany a resource consent application for any of the above activities.

15A.3.1 All Zones

- (a) The subdivision of land.
- (b) Within the Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a restricted discretionary activity in Chapter 15 are a restricted discretionary activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (c) Within the Commercial Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a restricted discretionary activity in Chapter 17 are a restricted discretionary activity, provided activities comply with all relevant conditions contained within Chapter 17.
- (d) Within the Greenbelt Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a restricted discretionary activity in Chapter 18 are a restricted discretionary, provided activities comply with all relevant conditions contained within Chapter 18.
- (e) Within the Open Space Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a restricted discretionary activity in Chapter 20 are a restricted discretionary, provided activities comply with all relevant conditions contained within Chapter 20.

15A.3.2 Residential Zone

- (a) Any development within the Arapaepae Road Special Treatment Overlay noted on Structure Plan 013

15A.3.3 Commercial Zone

- (a) Development of new buildings and additions or external alterations to building frontages. (Refer Rule ~~15A.8.3.1~~15A.8.2.4).

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- (b) Supermarkets (Refer Rule ~~15A.8.3.2~~15A.8.2.2).
- (c) Drive-through restaurants. (Refer Rule ~~15A.8.3.3~~15A.8.2.3).

15A.4 DISCRETIONARY ACTIVITIES

The following activities are discretionary activities.

Note: Refer to Chapter 25 for Assessment Criteria as a guide for preparing an assessment of environmental effects to accompany a resource consent application for any of the above activities.

15A.4.1 All Zones

- (a) Within the Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a discretionary activity in Chapter 15 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Commercial Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a discretionary activity in Chapter 17 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 17.
- (c) Within the Greenbelt Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a discretionary activity in Chapter 18 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (d) Within the Open Space Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a discretionary activity in Chapter 20 are a discretionary activity, provided activities comply with all relevant conditions contained within Chapter 20.
- (e) Any activity not otherwise specified.

15A.4.2 Residential Zones

- (a) Any subdivision that does not comply with the restricted discretionary activity conditions (Refer Rule ~~15A.8.2.1~~15A.8.1.1), except where the subdivision is a non-complying activity in accordance with Rule 15A.5.1(a) and/or Rule 15A.5.1(f).

15A.4.3 Commercial Zone

- (a) Commercial activities that do not comply with maximum floor area limits.
- (b) Development of a new building, or additions and/or alterations to existing building frontages that do not comply with the conditions for Restricted Discretionary Activities in Rule ~~15A.8.3.1~~15A.8.2.1

15A.5 NON-COMPLYING ACTIVITIES

The following activities are non-complying activities.

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Note: Refer to Chapter 25 for Assessment Criteria as a guide for preparing an assessment of environmental effects to accompany a resource consent application for any of the above activities.

15A.5.1 All Zones

- (a) Within the Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a non-complying activity in Chapter 15 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 15.
- (b) Within the Commercial Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a non-complying activity in Chapter 17 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 17.
- (c) Within the Greenbelt Residential Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a non-complying activity in Chapter 18 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 18.
- (d) Within the Open Space Zone of the ~~Taraika~~Tara-Ika Precinct, activities listed as a non-complying activity in Chapter 20 are a non-complying activity, provided activities comply with all relevant conditions contained within Chapter 20.
- (e) Subdivision or land use activities that are not consistent with Structure Plan 013.
- (f) Subdivision that does not comply with Rule ~~15A.8.2.2(b)(ii)~~15A.8.1.2(b)(ii), ~~15A.8.3.4(b)(ii)~~15A.8.2.4(b)(ii), ~~15A.8.4.1(b)(ii)~~15A.8.3.1(b)(ii), or ~~15A.8.5.1(b)(ii)~~15A.8.4.1(b)(ii).
- (g) Any activity that does not comply with Rule 15A.6.1.1 – Vehicle Access into Strategic Cycleways.
- (h) Industrial Activities.
- (i) Large Format Retailing.

15A.6 CONDITIONS FOR PERMITTED ACTIVITIES

Note: The permitted activity conditions within the relevant zone chapter for the relevant activity type also apply. Where there is conflict between provisions, the more specific provision (i.e. the provisions of this chapter) apply.

The following conditions shall apply to all permitted activities:

15A.6.1 All Zones

15A.6.1.1 Vehicle Access into Strategic Cycleways

- (a) No vehicle crossings shall cross a strategic cycleway shown on Structure Plan 013 will be permitted. In such cases, vehicle access to the site shall be via ~~the side roads~~ or rear access lanes shown on Structure Plan 013

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15A.6.2 Residential Zones

15A.6.2.1 Rainwater Tanks

- (a) All dwellings shall have a rainwater collection tank permanently connected to internal and external non-potable reuse including toilet flushing, laundry, and outdoor taps. Rainwater tanks must be design and installed as follows:
- (i) Size of tank:
- Roof area of 75m² or less - minimum 2,000 litre capacity
 - Roof area of 75m² to 200m² - minimum 3,000 litre capacity
 - Roof area of more than 200m² - minimum 5,000 litre capacity
- (ii) The roof area to be connected will be the total footprint of the building (excluding freestanding accessory buildings) and 90% of this must be able to freely drain to the tank without need for pumping. Only runoff from roof surfaces is to be collected into the rainwater tanks.
- (iii) The rainwater tank, plumbing and pump system must be maintained in working condition ~~of~~over the life of the dwelling.
- (iv) The public potable water supply shall be adequately protected by installation of a non-return valve.
- (v) Rainwater tanks are to overflow when full into an on-lot soakage device for stormwater disposal.
- Note: Multi-unit dwellings may share an appropriate sized communal tank to be determined at land use or subdivision consent stage.

15A.6.2.2 Maximum Building Height

- (a) In the medium density area the maximum height shall be 10 metres.

15A.6.2.3 Integral Garages

- (a) Integral garages shall account for no more than 50% of the front façade of the dwelling unless the garage component is recessed back from the main pedestrian entrance to the dwelling by at least 1 metre

15A.6.2.4 Building Setback from Boundaries

Front/Road Boundary

- (a) No building shall be located closer than 2 metres from any road boundary, except that a 5 metre long vehicle standing space shall be provided between the road boundary and any structure housing a vehicle where the vehicle takes direct access to the structure from the road.

15A.6.2.5 Daylight Access

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- (b) Where two dwellings are joined, there shall be no daylight access standard along the shared boundary.

15A.6.2.6 Fencing

- (a) Front Road Boundary

- (i) Local Roads

- The maximum height of a fence or wall sited on the boundary or within 2 metres of the boundary shall be no greater than 1.2 metre high.

- (ii) Collector and Arterial Roads

- The maximum height of a fence or wall sited on the boundary or within 2 metres from the boundary is 1.5m high

- (b) Boundaries adjoining a public reserve or cycle way

- The maximum height of a closed style fence or wall sited on the boundary or within 1.2 metre from the boundary is 1m high

Or

- The maximum height of an open pool style or trellis fence or wall sited on the boundary or within 1 metre from the boundary is 1.8m high

- (c) Other Boundaries

- The maximum height of a fence or wall sited on the boundary or within 1 metre from the boundary shall not exceed 2 metres.
- Fences perpendicular to the road shall taper downwards towards the road boundary. The taper should commence at least 1.5m from the road boundary and the maximum height of the fence where it meets the road boundary shall be 1.2m high if the road is a local road, or 1.5m high if it is an arterial or collector road.

15A.6.3 Commercial

15A.6.3.1 Signs

- (a) A maximum of 2 signs will be permitted per frontage in any 2 of the following preferred locations:

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- Building façade;
- Verandah fascia;
- Under verandah;
- Side wall;
- Inside the display window.

(b) Signs in the commercial zone shall be limited to the following sizes

Table 15A-1: Sign Dimensions

Sign Type	Maximum Dimensions
Building Façade	Maximum area 1.2m ² .
Verandah Fascia	Must not extend beyond the fascia.
Under Veranda	Must have a least 2.5m clearance above the ground.
Side Wall	Maximum 8m ² and set back at least 0.5m from corner.
Inside the Display Window	Depth of sign must be no greater than 0.3m and must be either above 2m high or below 0.8m high in relation to ground.

(c) There shall be no remote signage

15A.6.4 Greenbelt Residential

15A.6.4.1 Rainwater Tanks

(a) All dwellings shall have a rainwater collection tank permanently connected to internal and external non-potable reuse including toilet flushing, laundry, and outdoor taps. Rainwater tanks must be design and installed as follows:

(i) Size of tank:

- Roof area of 75m² or less - minimum 2,000 litre capacity
- Roof area of 75m² to 200m² - minimum 3,000 litre capacity
- Roof area of more than 200m² - minimum 5,000 litre capacity

(ii) The roof area to be connected will be the total footprint of the building (excluding freestanding accessory buildings) and 90% of this must be able to freely drain to the tank without need for pumping. Only runoff from roof surfaces is to be collected into the rainwater tanks.

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- (iii) The rainwater tank, plumbing and pump system must be maintained in working condition over the life of the dwelling.
- (iv) The public potable water supply shall be adequately protected by installation of a non-return valve.
- (v) Rainwater tanks to overflow when full into an on-lot soakage device for stormwater disposal.

Note: Multi-unit dwellings may share an appropriate sized communal tank to be determined at land use or subdivision consent stage.

15A.7 MATTERS OF CONTROL AND CONDITIONS FOR CONTROLLED ACTIVITIES

There are no ~~Taraika~~Tara-Ika Precinct specific Matters of Control. The matters of control and conditions for controlled activities contained within the relevant zone chapter for the relevant activity type apply.

15A.8 MATTERS OF DISCRETION AND CONDITIONS FOR RESTRICTED DISCRETIONARY ACTIVITIES

Note: The matters of discretion and conditions for restricted discretionary activities contained within the relevant zone chapter for the relevant activity type also apply.

The matters over which Council has restricted its discretion for each restricted discretionary activity, and the conditions for each activity, are detailed below:

15A.8.1 All Zones

15A.8.1.1 Conditions for All Restricted Discretionary Activities

(i) Stormwater Management Plan

All applications for restricted discretionary activities must include a stormwater management plan which sets out how stormwater will be managed via both onsite and centralised treatment and soakage facilities (i.e. wetlands and soakage basins) in a manner that ensures stormwater is retained and disposed of within the Tara-Ika Growth Area for up to a 1 in 100 year average recurrence interval (ARI) rainfall event (with allowance for climate change). The Plan shall be consistent with the more stringent of the Horowhenua District Plan Subdivision and Development Principles and Requirements 2014 and NZS 4404:2010 (Land development and subdivision infrastructure) and shall include the following:

- The size, design, location and expected maintenance of stormwater management devices (e.g. rainwater tanks, on-lot soakage, wetlands and soakage basins), including those to be vested with Council.
 - Pre-soakage treatment is required for all runoff from all impervious surfaces excluding roofs and other on-lot impervious areas (patios, shed etc.) but including private driveways and parking areas. The primary method of treatment shall be through centralised end-of-pipe stormwater wetlands that are sized and located to efficiently

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service the Tara-Ika Growth Area in an integrated manner. Wetlands shall include a high flow bypass into an adjoining/downstream soakage basin for disposal, sized to bypass flows greater than the Water Quality Flow.

- The stormwater treatment devices (wetlands) shall be sized to accommodate the Water Quality Flow and Water Quality Volume of the contributing catchment, excluding the roof and on-lot impervious areas that are connected to appropriately sized on-lot soakage devices. The contributing catchment includes adjoining development blocks within Tara-Ika and must consider the future developed upstream catchment.

The stormwater soakage devices shall be sized to provide full retention and disposal of the 1 in 100 year ARI runoff volume (with allowance for climate change) with no overflows to the downstream environment.

- Overland flow paths for the 100-year ARI rainfall event (with allowance for climate change) and proposed mechanisms for managing these. The reduction of runoff volume and flow from on-lot soakage disposal cannot be considered in the sizing calculations for the 100-year ARI overland flow path, in order to ensure sufficient capacity is available during extreme events.
- Calculations undertaken to prepare the stormwater management plan. These should be carried out in the following manner:
 - The 12-hour nested design storm specified by Wellington Water in “Reference Guide for Design Storm Hydrology” (2019) shall be applied to Tara-Ika stormwater design calculations.
 - Design storms shall be developed with HIRDS v4 rainfall data for the development site using the RCP 8.5 (2081-2100) climate change scenario.
 - The soakage rate for on-lot soakage devices to receive roof runoff from roofs and other impervious areas (excluding driveways and parking areas) shall be determined by carrying out soakage testing in accordance with Horowhenua District Plan Subdivision and Design Requirements and Principles, with a safety factor of 1.5 applied to the testing results (i.e., divide soakage rate result by 1.5). Evidence of the site-specific soakage testing must be provided, including the suitability of soil layers at the location and depth of the proposed on-lot soakage. In the absence of soakage testing or for the purposes of initial design a soakage rate of 100mm per hour will be applied. Rainwater tank volume shall not be considered in the sizing of on-lot soakage.
 - The Water Quality Volume (WQV) and the Water Quality Flow (WQF) used to size treatment devices shall be calculated using the method specified in Wellington Water’s “Water Sensitive Design for Stormwater: Treatment Device Design Guideline” (2019).

Acceptable design standards for treatment and soakage devices include Wellington Water’s “Water Sensitive Design for Stormwater: Treatment Device

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Design Guideline” (2019), or Auckland Council’s “Stormwater Management Devices in the Auckland Region” (2017).

Advice Note: Pre-application meetings with Council are strongly encouraged.

~~15A.8.1~~15A.8.2 Residential Zones

~~15A.8.1.1~~15A.8.2.1 Development within the Arapaepae Road Special Treatment Overlay (Refer to Rule 15A.3.2(a))

(a) Matters of Discretion

(i) Reverse sensitivity effects, including:

- Noise
- Vibration
- Visual
- Traffic

(ii) Compatibility with surrounding and anticipated land uses.

(iii) Safe and efficient access

(b) Conditions

- (i) New buildings or alterations to existing buildings containing noise sensitive activities must be design, constructed and maintained to achieve the indoor design noise levels from Arapaepae Road/State Highway 57 traffic set out in ~~Table 15A-2~~Table 15A-2 below (excludes area not deemed to be habitable spaces as defined by Schedule 1 of the Building Regulations 1992:

Table 15A-2 Indoor Design Limits

Building Type	Occupancy/Activity	Maximum Indoor Design Noise Level $L_{Aeq}(24h)$
Residential	Living spaces, sleeping spaces (including visitor accommodation and retirement accommodation)	40dB
Education	Assembly halls	35dB
	Conference rooms, drama studios	40dB
	Lecture rooms and theatres, music studios	35dB
	Libraries	45dB

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	Sleeping areas in educational facilities	40dB
	Teaching areas	40dB
Health	Overnight medical care, wards	40dB
	Clinics, consulting rooms, theatres, nurses' stations	45dB
Cultural Buildings	Places of worship, marae	35dB

Note: This table is informed by ~~NZTAs~~ Waka Kotahi guidance material on managing State Highway noise. The purpose of this table is simply to specify the noise level standards for different types of activities. It should not be taken as an indication of what types of activities will more broadly be considered acceptable in this location.

- (ii) If windows must be closed to achieve the design noise levels in (i), the building must be designed, constructed and maintained with a ventilation and cooling system. For habitable spaces a ventilation cooling system must achieve the following:
- Ventilation must be provided to meet clause G4 of the New Zealand Building Code. Noise from the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser.
 - The occupant must be able to control the ventilation rate in increments up to a high air flow setting that provides at least 6 air changes per hour. Noise from the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser.
 - The system must provide cooling controllable by the occupant that can maintain the temperature at no greater than 25°C. Noise from the system must not exceed 30 dB LAeq(30s) when measured 1 m away from any grille or diffuser.
- (iii) A design report prepared by a suitably qualified and experienced acoustics specialist must be submitted with the building consent application for construction or alteration of any building containing a noise sensitive activity in or partly in the Arapaepae Road Special Treatment Overlay.
- (c) Non-Notification

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- (i) Under section 77D of the RMA, an activity requiring resource consent under Rule 15.7.1 shall not be publicly notified or limited notified, except where:
- The Council decides special circumstances exist (pursuant to Section 95A(9)); or
 - The applicant requests public notification (pursuant to Section 95A(3)(a))

~~15A.8.1.2~~ 15A.8.2.2 Subdivision (Refer to Rule 15A.3.1(a))

(a) Matters of Discretion

- (i) Consistency with Structure Plan 013.
- (ii) For subdivisions within the medium density area, consistency with the Medium Density Residential Development Design Guide.
- (iii) The design, ~~and~~ layout and variety of the subdivision, including the size, shape and position of any lot, as well as the future land use and development of each lot. In addition, connectivity and linkages (both within and beyond the subdivision) energy efficiency and conservation, and access to solar energy:-
- ~~(iv) Whether the subdivision contains a variety of lot sizes suitable for the area it is located within.~~
- ~~(v) Whether the subdivision and likely future development will represent good urban design and will result in the level of amenity anticipated for the area.~~
- ~~(vi)~~ (iv) Provision of land for publically accessible ey open space and recreation that is appropriately located and of a practicable size and shape for recreation and to support management of stormwater during heavy rain events, in accordance with Structure Plan 013.
- ~~(vii)~~ (v) Whether the proposal includes ~~The the~~ provision of practicable street plantings.
- ~~(viii)~~ (vi) The provision of access, any new roads, cycleways, and provision of linkages to existing roads, ~~access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.~~
- ~~(ix) The provision of access to sites, including passing bays, car parking and manoeuvring areas, and any necessary easements.~~
- ~~(x)~~ (vii) The management of traffic generated and potential adverse effects on the safety and efficiency of the street network.

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

~~(xi)~~(viii) Minimise use of cul-de-sacs, particularly cul-de-sacs that are long or have poor visibility to or from the street they connect to.

~~(xii)~~(ix) Consideration of Crime Prevention through Environmental Design Principles.

~~(xiii)~~(x) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, telecommunications, gas and electricity.

~~(xiv)~~(xi) Effects on significant sites and features, including natural/ecological, cultural, archaeological and historical sites.

~~(xv)~~(xii) Avoidance or mitigation of natural hazards.

~~(xvi)~~(xiii) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control. This may require cut and fill plans and erosion and sediment control plans to be submitted with applications for subdivision.

~~(xvii)~~(xiv) Whether tikanga and cultural protocols will be followed during the construction phase, particularly when undertaking earthworks.

~~(xviii)~~(xv) The staging of development and timing of works.

~~(xix)~~(xvi) Compliance with the Council's Subdivision and Development Principles and Requirements (Version: July 2014).

(xvii) The potential effects of the development on the safe and efficient operation, upgrading, maintenance and replacement of existing lawfully established network utilities.

~~(xx)~~(xviii) Those matters described in Sections 108 and 220 of the RMA

(b) Conditions

(i) Minimum Allotment Area and Shape

Each allotment shall comply with the following site area and shape factor standards for each settlement set out in Table 15A-3~~Table 15A-3~~ below.

Table 15A-3: Standards Applying to Subdivision and Residential Dwelling Units

Residential Zone	Minimum Net Site Area	Maximum Net Site Area/Maximum Density	Minimum Shape Factor	Other Requirements	<u>Road Frontage</u>

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

Medium Density	Attached Units: 150m ^{2*}	450m ^{2*}	7m	Maximum street block length: 200m Must include building siting plan.*	All sites must have road frontage for at least 7m
	Detached Units: 225m ^{2*}	450m ^{2*}	10m	Maximum block length: 200m Must include building siting plan.*	
Standard Residential	330m ²	-	13m	Maximum block length: 200m	
Low Density Residential	1000m ²	-	18m	N/A	

*The siting plan shall show the location, pedestrian entrances, and outdoor living areas for all future dwellings. Although the dwellings do not need to be built prior to s224 being issued, a condition will be imposed on the subdivision requiring the siting plan to be complied with at the time the site is developed. This outcome will be secured by consent notice.

(ii) Structure Plan

- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.
- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

(i) Under section 77D of the RMA, an activity requiring resource consent under Rule 15A.8.2.2 shall not be publicly notified or limited notified, except where:

- The Council decides special circumstances exist (pursuant to Section 95A(9); or
- The applicant requests public notification (pursuant to Section 95A(3)(a)

~~15A.8.1.3~~15A.8.2.3 **Non-Compliance with requirements for Rainwater Tank (Refer Rule 15A.6.2.1)**

(a) Matters of Discretion

- (i) The potential for increased volume stormwater discharge from the site.
- (ii) The proposed methods of managing the quality and quantity of storm water discharge from the site.

~~15A.8.1.4~~15A.8.2.4 **Non-Compliance with Integral Garages (Refer Rule 15A.6.2.3)**

(a) Matters of Discretion

- (i) The extent to which the integral garage obscures the dwelling from view and/or detracts from the dwelling as the primary feature on the site.
- (ii) The extent to which the integral garage reduces the opportunity for passive surveillance between the dwelling and the streetscape.
- ~~(iii) The extent to which the integral garage detracts from the dwelling as the primary feature on the site.~~
- ~~(iv)~~(iii) The effect of the integral garage's position on streetscape character and residential amenity.

~~15A.8.1.5~~15A.8.2.5 **Non-Compliance with Fencing (Refer to Rule 15A.6.2.6)**

(a) Matters of Discretion

- ~~(i)~~ The extent to which the fence reduces the opportunity for passive surveillance and social interaction between public and private space.

~~15A.8.2~~15A.8.3 **-Commercial Zone**

~~15A.8.2.1~~15A.8.3.1 **New Buildings and Additions/Alterations to Building Frontage (Refer Rule 15A.3.3(a))**

(a) Matters of Discretion

15A RULES: **TARAIKATARA-IKA** MULTI-ZONE PRECINCT

- (i) Building design and façade treatment should create a high amenity commercial environment that contributes positively to the public realm and enhances pedestrian experience by providing opportunity for interaction between shops front and the street. This includes but is not limited to:
 - Locating main building façades to address the primary street frontage.
 - Providing an interesting and varied building frontage that is not dominated by either featureless facades or glazing.
 - Including horizontal and/or vertical articulation design elements to add visual interest.
 - Designing building frontages that complement any existing adjoining buildings.
 - Locating doorways and entrances to buildings so they are easily identifiable.
 - (ii) The building and site design and layout should prioritise pedestrians over vehicles. This includes but is not limited to:
 - Pedestrian entrances to shops are built right up to the footpath.
 - Any onsite carparking, services areas, and storage areas should be located the rear of the building. They should not be located between the street and the pedestrian entrance to the building.
 - If carparks, services areas, and storage areas are visible from the street, they should be well screened from the street by landscaping or similar.
 - (iii) The provision of verandah that:
 - Provide weather protection to pedestrians
 - Contribute to the overall appearance and pleasantness of the street
 - (iv) The application of Crime Prevention through Environmental Design (CPTED) Principles, including:
 - Building design and layout.
 - Use of appropriate planting and landscaping.
 - (v) Proposed methods of managing the quality and quantity of stormwater.
- (b) Conditions

15A RULES: ~~TARA~~IKATARA-IKA MULTI-ZONE PRECINCT

- (i) All buildings in the Commercial Zone (~~Tara~~ikaTara-Ika Precinct) must comply with the following:
- No part of any building shall exceed a height of 15 metres.
 - All buildings shall be built to the front road boundary of the site.
 - All building shall be built up to the side boundaries (the boundary which is perpendicular to the primary road frontage).
 - All buildings shall have display windows along the ground floor road frontage. At least 50% of ground floor facade surface shall be display space or transparent window or doors. The minimum window area shall be kept clear and not be boarded up, painted or covered by signage.
 - No building shall have a continuous featureless façade/blank wall on the ground floor road frontage wider than 4 metres. A featureless façade or blank wall is a flat or curved wall surface without any openings, glazing or columns, recesses, niches or other architectural detailing
 - All buildings shall have a maximum ground floor road frontage width for individual tenancies of 15 metres.
 - All building frontages shall have a minimum height of 6 metres.
 - The above standards do not apply to service lane frontages.
- (ii) All buildings in the Commercial Zone (~~Tara~~ikaTara-Ika Precinct) must contain a verandah and the verandah must comply with the following:
- A minimum clearance of 2.5 metres directly above the footpath or formed ground surface.
 - A maximum clearance of 4 metres (measured at the base of the verandah fascia) directly above the footpath or from ground surface.
 - Extend for the full length of the building.
 - Extend outwards from the front of the building to the far side of the kerbing less than 450mm, or the verandah extends out 3 metres whichever is the lesser.
 - Provide continuous shelter with any adjoining verandah or pedestrian shelter.

~~15A.8.2~~15A.8.3.2 Supermarkets (Refer to Rule 15A.3.3(b))

- (a) Matters of Discretion

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

- (i) Whether parking areas, vehicle access and servicing arrangements are designed and located in a manner that protects the visual amenity of the streetscape and pedestrian safety, including the use of landscaping, planting and lighting.
 - (ii) Whether the design and layout of the site and buildings protects the visual amenity of the streetscape and pedestrian safety. For example:
 - The extent of featureless facades.
 - The extent of glazing.
 - The extent of signage.
 - The extent of window displays that prevent visibility into the store from the street.
 - (iii) Whether effects arising from operation (for example, hours, location of service areas, waste disposal) will be compatible with any nearby residential zones.
- (b) Conditions
- (i) Car parking ~~(as required by Chapter 21)~~ (if chosen to be provided) must be provided to the rear of the building.
 - (ii) The main pedestrian entrance to the supermarket must front the street.

~~15A.8.2.3~~ 15A.8.3.3 Drive-Through Restaurants (Refer to Rule 15A.3.3(c))

- (a) Matters of Discretion
- (i) Whether the design and layout of the site and buildings protects the visual amenity of the streetscape and pedestrian safety. For example:
 - The extent of featureless facades.
 - The extent of glazing.
 - The extent of signage.
 - The extent of window displays that prevent visibility into the store from the street.
 - Screening and/or landscaping of equipment, parking and service areas.
 - Whether the location of the drive-through detracts from pedestrian experience by creating a barrier between the building and the footpath.
 - (ii) Whether operating effects are compatible with surrounding land uses (particular residential areas). For example:

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

- Whether the activity, including parking areas and storage and servicing facilities, is adequately screened to protect the visual amenity of surrounding land uses.
 - Whether the activity, including parking areas and storage and servicing facilities, are located, designed and managed to avoid nuisance effects such as noise and odour on surrounding land uses.
 - The impact of adverse effects arising from the numbers of people and/or vehicles using the site.
 - The effects of the activity's operation on the existing and expected future amenity values of the surrounding area and any mitigation measures proposed.
- (iii) Whether the site is located, designed and laid out in a manner that avoids adverse effects on the safe and effective operation of the roading network, including pedestrians. For example:
- Whether the nature and scale of vehicle movements associated with the activity will have an adverse effect on road users.
 - Whether the drive through is positioned to provide sufficient off-road queuing space during peak times.
 - Whether the site is designed to allow a free flow of traffic from the road into the parking area.
 - Whether the activity is designed in such a manner that vehicles can manoeuvre on-site in a safe and efficient manner.
 - Whether sufficient vehicle (including service vehicles) and pedestrian access is provided to the site to minimise conflict between pedestrians and vehicles.
- (b) Conditions
- (i) The main pedestrian entrance to the restaurant must front the street.
- (ii) Car parking (~~as required by Chapter 21~~ if chosen to be provided) must be provided to the rear of the building.

~~15A.8.2.4~~ 15A.8.3.4 Subdivision (Refer to Rule 15A.3.1(a))

- (a) Matters of Discretion
- (i) Consistency with Structure Plan 013.
- (ii) The design and layout of the subdivision, including the size, shape and position of any lot, including the future land use and development of each lot. In addition, the location of building sites, separation distances, orientation of buildings, and screening/landscape treatment.

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

- (iii) The amalgamation of any proposed allotments or balance areas to existing titles of land.
 - (iv) The provision of ~~any access, any~~ new roads, cycleways, footpaths, provision of linkages to existing roads, ~~access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.~~
 - (v) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, streetlighting, telecommunications and electricity and, where applicable gas.
 - (vi) Provision of reserves, esplanade reserves, esplanade strips and access strips, including connections to existing and future reserves.
 - (vii) Effects on significant sites and features, including natural, ecological, cultural, archaeological and historical sites.
 - (viii) Site contamination remediation measures and works.
 - (ix) Avoidance or mitigation of natural hazards.
 - (x) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control. This may require cut and fill plans and erosion and sediment control plans to be submitted with applications for subdivision.
 - (xi) Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.
 - (xii) Staging of the subdivision.
 - (xiii) Compliance with the Councils Subdivision and Development Principles and Requirements (Version: July 2014).
 - (xiv) Those matters described in Sections 108 and 220 of the RMA.
- (b) Conditions
- (i) All lots shall demonstrate compliance with the relevant permitted activity conditions, except no minimum lot area requirement applies.
 - (ii) Structure Plan
 - A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

- (i) Under section 77D of the RMA, an activity requiring resource consent under Rule ~~15A.8.3.4~~~~15.7.1~~ shall not be publicly notified or limited notified, except where:

- The Council decides special circumstances exist (pursuant to Section 95A(9)); or
- The applicant requests public notification (pursuant to Section 95A(3)(a))

~~15A.8.3~~15A.8.4 Open Space Zone

~~15A.8.3.1~~15A.8.4.1 Subdivision (Refer to Rule 15A.3.1(a))

(a) Matters of Discretion

- (i) Consistency with Structure Plan 013.
- (ii) The design and layout of the subdivision, including the size, shape and position of any lot, including the future land use and development of each lot. In addition, the location of building sites, separation distances, orientation of buildings, and screening/landscape treatment.
- (iii) The amalgamation of any proposed allotments or balance areas to existing titles of land.
- (iv) The provision of ~~any access, new roads, cycleways, footpaths, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.~~

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

- (v) The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, street lighting, telecommunications and electricity and, where applicable gas.
 - (vi) Provision of reserves, esplanade reserves, esplanade strips and access strips, including connections to existing and future reserves.
 - (vii) Effects on significant sites and features, including natural, ecological, cultural, archaeological and historical sites.
 - (viii) Site contamination remediation measures and works.
 - (ix) Avoidance or mitigation of natural hazards. ~~(Note: Refer to the “Risks and Responsibilities: Report of the Manawatu-Wanganui Regional Lifelines Project” (No. 2005/EXT/622) prepared by the Manawatu-Wanganui CDEM Group for information about natural hazards that may be relevant to the subject site).~~
 - (x) Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control. This may require cut and fill plans and erosion and sediment control plans to be submitted with applications for subdivision.
 - (xi) Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.
 - (xii) Staging of the subdivision.
 - (xiii) Compliance with the Councils Subdivision and Development Principles and Requirements (Version: July 2014).
 - (xiv) Those matters described in Sections 108 and 220 of the RMA.
- (b) Conditions
- (i) All lots shall demonstrate compliance with the relevant permitted activity conditions, except no minimum lot area requirement applies.
 - (ii) Structure Plan
 - A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.
 - A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

(i) Under section 77D of the RMA, an activity requiring resource consent under Rule ~~15A.8.4.1~~15A.8.4 shall not be publicly notified or limited notified, except where:

- The Council decides special circumstances exist (pursuant to Section 95A(9); or
- The applicant requests public notification (pursuant to Section 95A(3)(a))

~~15A.8.4~~15A.8.5 Greenbelt Residential

~~15A.8.4.1~~15A.8.5.1 Subdivision (Refer to Rule 15A.3.1(a))

(a) Matters of Discretion

(i) Consistency with Structure Plan 013.

(ii) The design and layout of the subdivision, including the size, shape and position of any lot, as well as the future land use and development of each lot. In addition, connectivity and linkages (both within and beyond the subdivision) energy efficiency and conservation, and access to solar energy.

~~(iii) Whether the subdivision contains a variety of lot sizes suitable for the area it is located within.~~

~~(iv) Whether the subdivision and likely future development will represent good urban design and will result in the level of amenity anticipated for the area.~~

~~(v)~~(iii) Provision of land for publically accessibly open space and recreation that is appropriately located and of a practicable size and shape to support management of stormwater during heavy rain events, in accordance with Structure Plan 013.

~~(vi)~~(iv) Whether the proposal includes ~~The~~ the provision of practicable street plantings.

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

~~(vii)~~(v) _____ The provision of ~~any~~access, ~~any~~ new roads, cycleways, footpaths, provision of linkages to existing roads, ~~access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas, and any necessary easements.~~

~~(viii)~~ _____ ~~The provision of access to sites, including passing bays, car parking and manoeuvring areas, and any necessary easements.~~

~~(ix)~~(vi) _____ The management of traffic generated and potential adverse effects on the safety and efficiency of the street network.

~~(x)~~(vii) _____ Minimise use of cul-de-sacs, particularly cul-de-sacs that are long or have poor visibility.

~~(xi)~~(viii) _____ Consideration of Crime Prevention through Environmental Design Principles.

~~(xii)~~(ix) _____ The provision of servicing, including water supply, wastewater systems, stormwater management and disposal, telecommunications, gas and electricity.

~~(xiii)~~(x) _____ Effects on significant sites and features, including natural/ecological, cultural, archaeological and historical sites.

~~(xiv)~~(xi) _____ The protection and enhancement of any natural habitat of indigenous species within the subdivision

~~(xv)~~(xii) _____ Avoidance or mitigation of natural hazards.

~~(xvi)~~(xiii) _____ Management of construction effects, including traffic movements, hours of operation, noise, earthworks and erosion and sediment control. This may require cut and fill plans and erosion and sediment control plans to be submitted with applications for subdivision.

~~(xvii)~~(xiv) _____ Whether tikanga and cultural protocols will be following during the construction phase, particularly when undertaking earthworks.

~~(xviii)~~(xv) _____ The staging of development and timing of works

~~(xix)~~(xvi) _____ Compliance with the Council's Subdivision and Development Principles and Requirements (Version: July 2014).

(xvii) _____ The potential effects of the development on the safe and efficient operation, upgrading, maintenance and replacement of existing lawfully established network utilities.

~~(xx)~~(xviii) _____ Those matters described in Sections 108 and 220 of the RMA

(b) Conditions

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

(i) Minimum Allotment Area and Shape

- Each allotment shall comply with the following site area and shape factor standards in ~~Table 15A-4~~Table 15A-4

Table 15A-4: Standards Applying to Subdivision and Residential Dwelling Units

Type of Allotment, or Subdivision	Minimum Area Per Allotment/Site	Minimum Shape Factor
Greenbelt Residential General Serviced	2000 square metres	20 metres diameter
Greenbelt Residential General Unserviced	5000 square metres	20 metres diameter

(ii) Structure Plan

- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site that contains an infrastructure asset as indicated by Structure Plan 013 requiring the infrastructure asset to be constructed and vested with Council to the full extent indicated on the Structure Plan.
- A condition will be imposed on the resource consent of any subdivision that creates additional allotments and involves a site/part of a site containing a park or reserve as shown on Structure Plan 013, requiring the site/part of the site containing the reserve to be vested within Council.

(iii) Water Supply, Wastewater and Other Services

All subdivisions shall comply with the requirements as specified set out in Chapter 24.

(iv) Roads and Access

All subdivisions shall comply with the requirements as specified in Chapter 21.

(v) Network Utilities

There shall be no minimum site area requirements for lots for network utility purposes.

(c) Non-Notification

15A RULES: ~~TARAIKATARA-IKA~~ MULTI-ZONE PRECINCT

- (i) Under section 77D of the RMA, an activity requiring resource consent under Rule ~~15A.8.5.145.7.4~~ shall not be publicly notified or limited notified, except where:
- The Council decides special circumstances exist (pursuant to Section 95A(9); or
 - The applicant requests public notification (pursuant to Section 95A(3)(a)

Appendix 3: Structure Plan 013 and Zoning Maps showing recommended changes

Transport

- Arterial road connections. Fixed location
- Collector road connections. Fixed location
- Local roads and laneways. Flexible location
- Strategic Cycleways (no private driveways to cross path).
- Otaki to North Levin Corridor
Shown for information purposed only.
Location and width to be refine and updated.








Zoning

- Commercial
- Education Overlay
- Arapaepae Rd Special Effect Overlay
- Medium Density Residential
- Residential
- Low Density Residential
- Greenbelt Residential
- Open Space




















LEGEND







ZONES

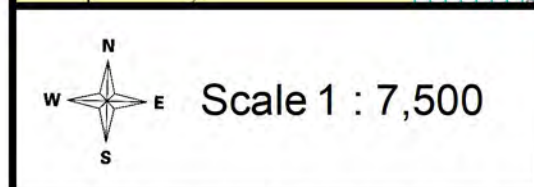
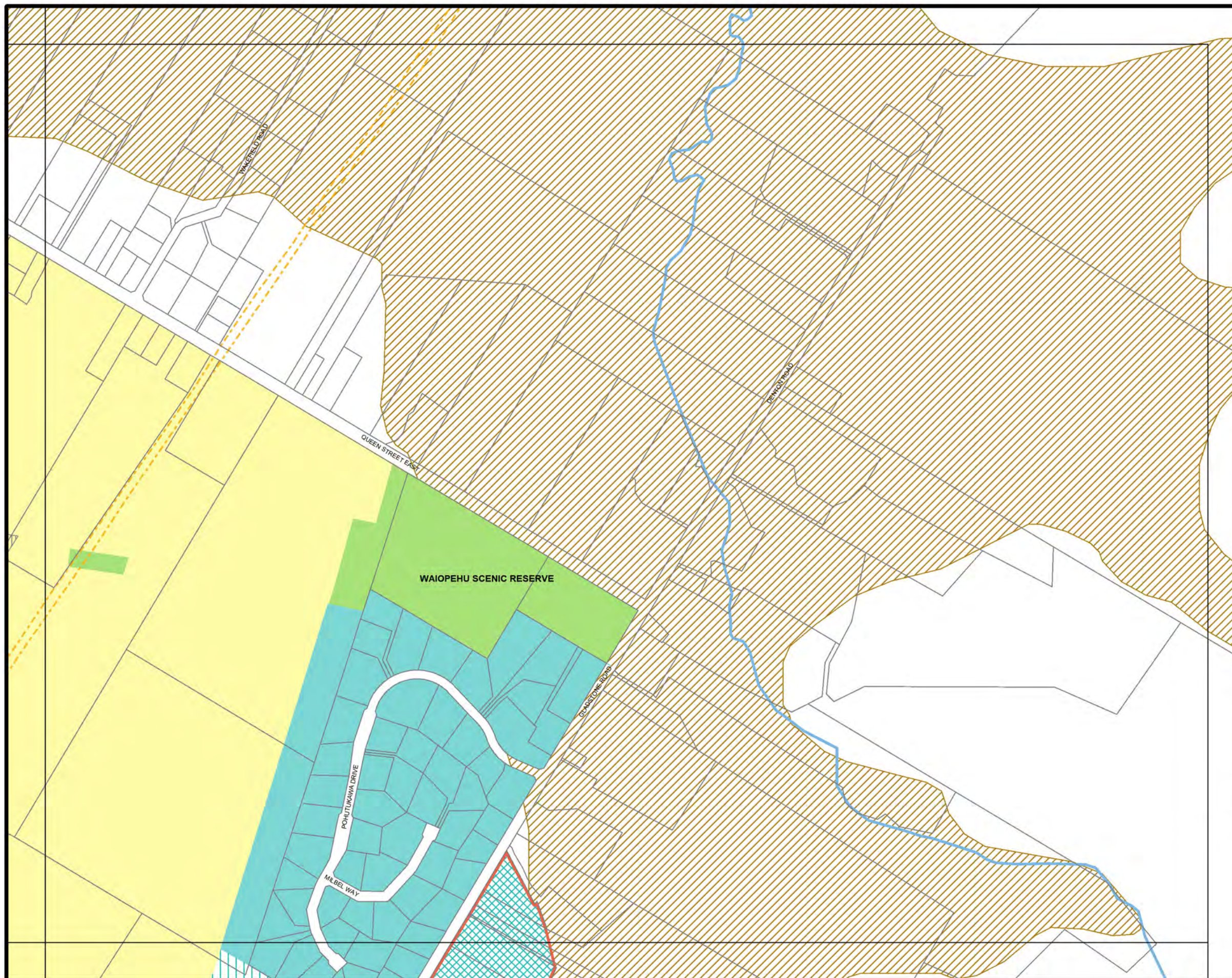
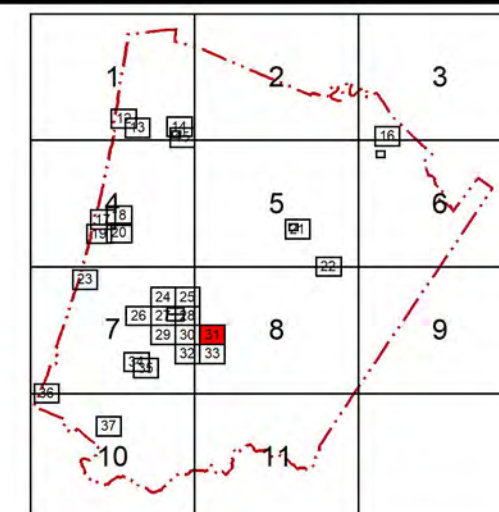
	Residential		Greenbelt Residential
	Commercial		Greenbelt Residential Deferred
	Industrial		Commercial Deferred
	Open Space		Residential Deferred
	Rural		

OVERLAYS

	Arapaepae Special Effects Overlay
	Greenbelt Residential Waitarere Rise
	Greenbelt Residential Foxton Beach North
	Strathnaver Coastal Natural Character Area
	Strathnaver Coastal Hazard Area
	Muhunua West Forest Park
	Muhunua West Forest Park Coastal Natural Character and Hazard Area
	Low Density Area
	Medium Density Area
	Large Format Retail Area
	Town Centre Heritage/Character Area
	Foxton Tourism Area
	Pedestrian Area
	Coastal Natural Character and Hazard Area
	Flood Hazard Area (1:50,000 Rural Maps Only)
	Moutoa Floodway (1:50,000 Rural Maps Only)
	Versatile Land (LUC Class I & II Soil)

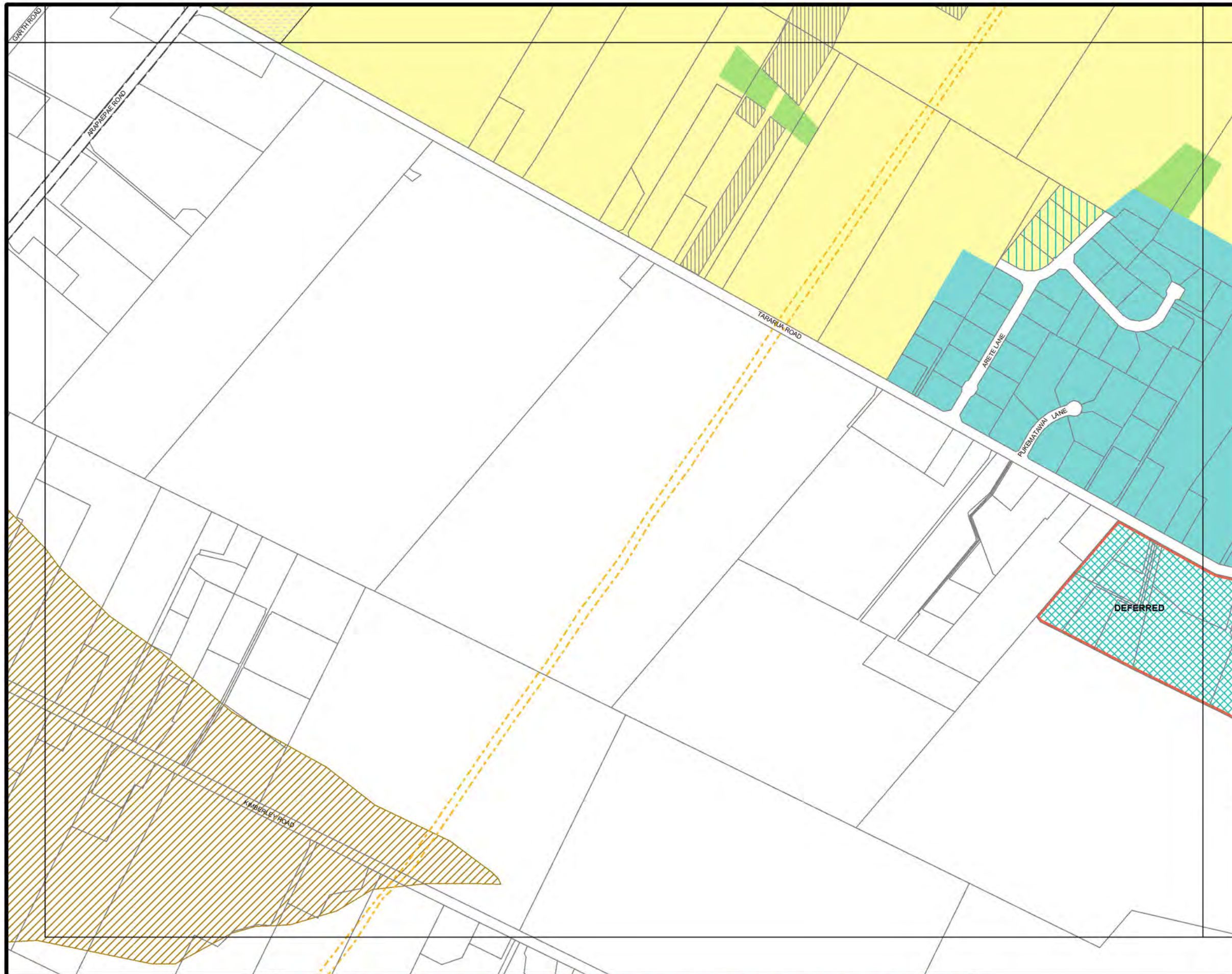
FEATURES

	Notable Tree
	Historic Heritage Building, Structure or Site
	Gas Transmission Pipeline
	National Grid Corridor (High Voltage Transmission Line)
	Designation
	Road



HOROWHENUA DISTRICT PLAN - PROPOSED PLAN CHANGE 4 RECOMMENDED CHANGES IN RESPONSE TO SUBMISSIONS LEVIN

Planning Map 31



LEGEND

ZONES

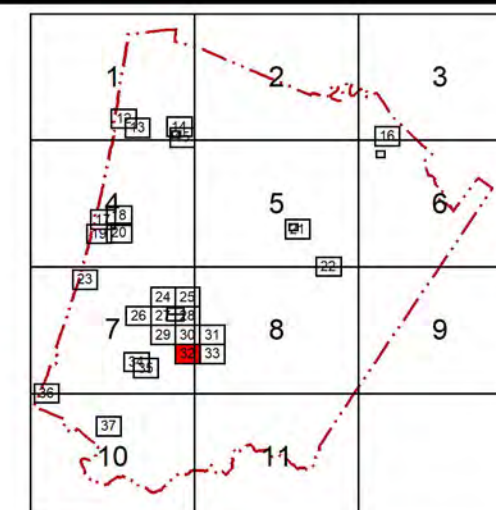
	Residential		Greenbelt Residential
	Commercial		Greenbelt Residential Deferred
	Industrial		Commercial Deferred
	Open Space		Residential Deferred
	Rural		

OVERLAYS

	Arapaepae Special Effects Overlay
	Greenbelt Residential Waitarere Rise
	Greenbelt Residential Foxton Beach North
	Strathnaver Coastal Natural Character Area
	Strathnaver Coastal Hazard Area
	Muhunua West Forest Park
	Muhunua West Forest Park Coastal Natural Character and Hazard Area
	Low Density Area
	Medium Density Area
	Large Format Retail Area
	Town Centre Heritage/Character Area
	Foxton Tourism Area
	Pedestrian Area
	Coastal Natural Character and Hazard Area
	Flood Hazard Area (1:50,000 Rural Maps Only)
	Moutoa Floodway (1:50,000 Rural Maps Only)
	Versatile Land (LUC Class I & II Soil)

FEATURES

	Notable Tree
	Historic Heritage Building, Structure or Site
	Gas Transmission Pipeline
	National Grid Corridor (High Voltage Transmission Line)
	Designation
	Road



LEGEND

ZONES

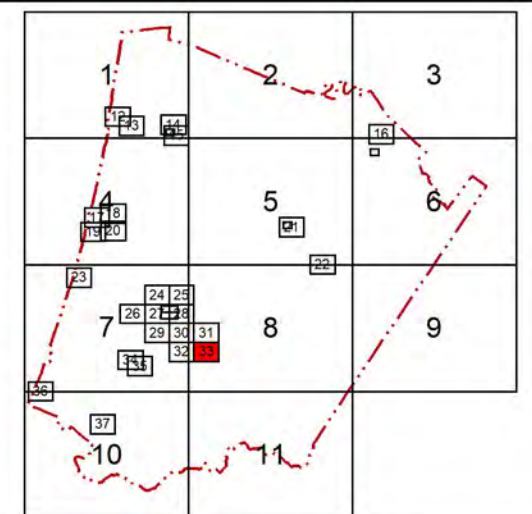
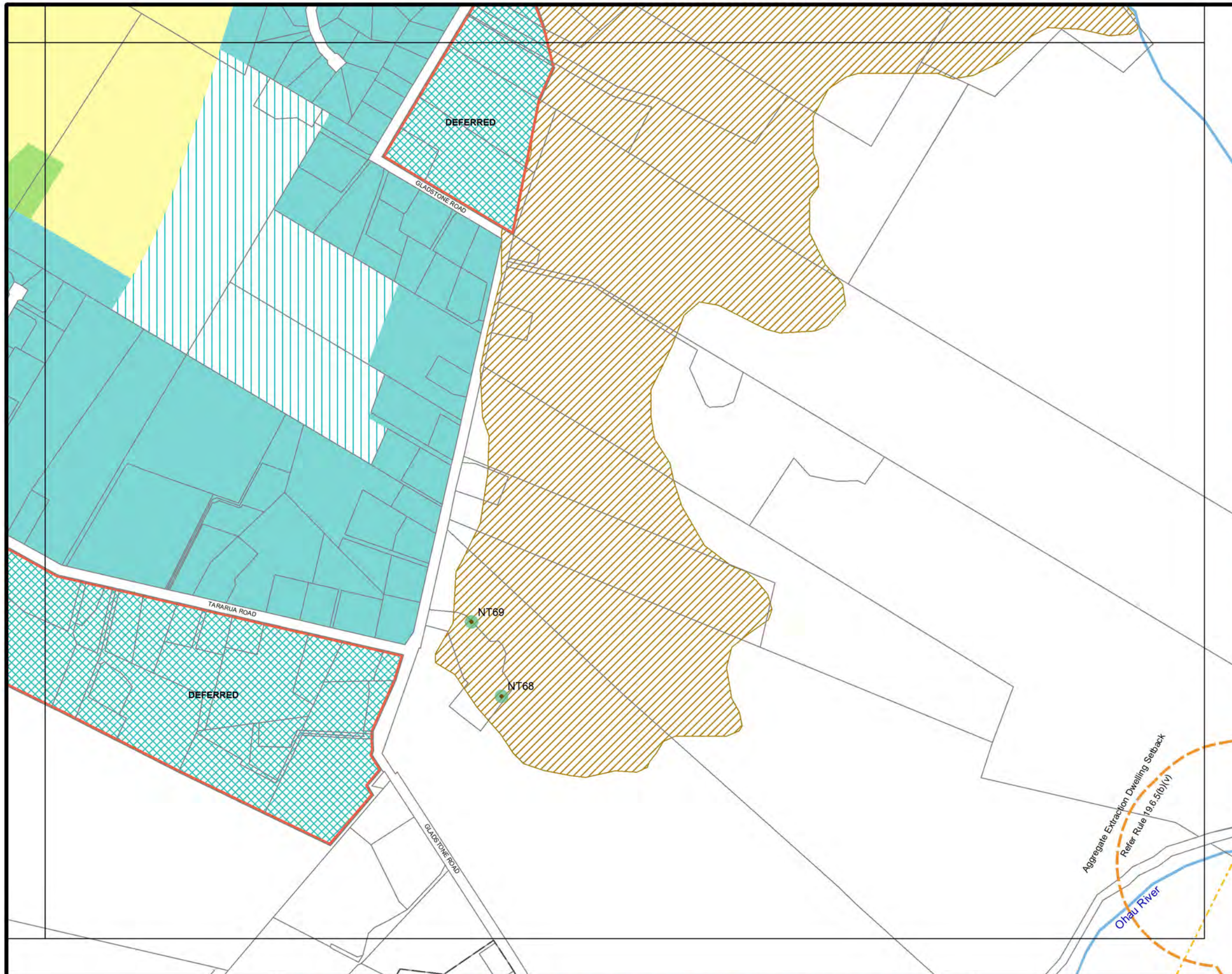
	Residential		Greenbelt Residential
	Commercial		Greenbelt Residential Deferred
	Industrial		Commercial Deferred
	Open Space		Residential Deferred
	Rural		

OVERLAYS

	Arapaepae Special Effects Overlay
	Greenbelt Residential Waitarere Rise
	Greenbelt Residential Foxton Beach North
	Strathnaver Coastal Natural Character Area
	Strathnaver Coastal Hazard Area
	Muhunua West Forest Park
	Muhunua West Forest Park Coastal Natural Character and Hazard Area
	Low Density Area
	Medium Density Area
	Large Format Retail Area
	Town Centre Heritage/Character Area
	Foxton Tourism Area
	Pedestrian Area
	Coastal Natural Character and Hazard Area
	Flood Hazard Area (1:50,000 Rural Maps Only)
	Moutoa Floodway (1:50,000 Rural Maps Only)
	Versatile Land (LUC Class I & II Soil)

FEATURES

	Notable Tree
	Historic Heritage Building, Structure or Site
	Gas Transmission Pipeline
	National Grid Corridor (High Voltage Transmission Line)
	Designation
	Road



Scale 1 : 7,500

HOROWHENUA DISTRICT PLAN - PROPOSED PLAN CHANGE 4 RECOMMENDED CHANGES IN RESPONSE TO SUBMISSIONS LEVIN

Planning Map 33

LEGEND

ZONES

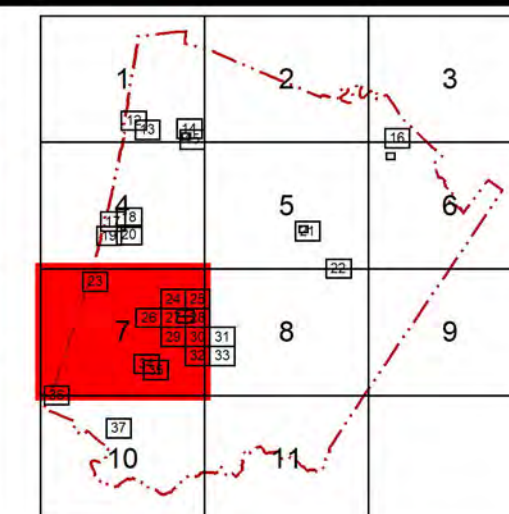
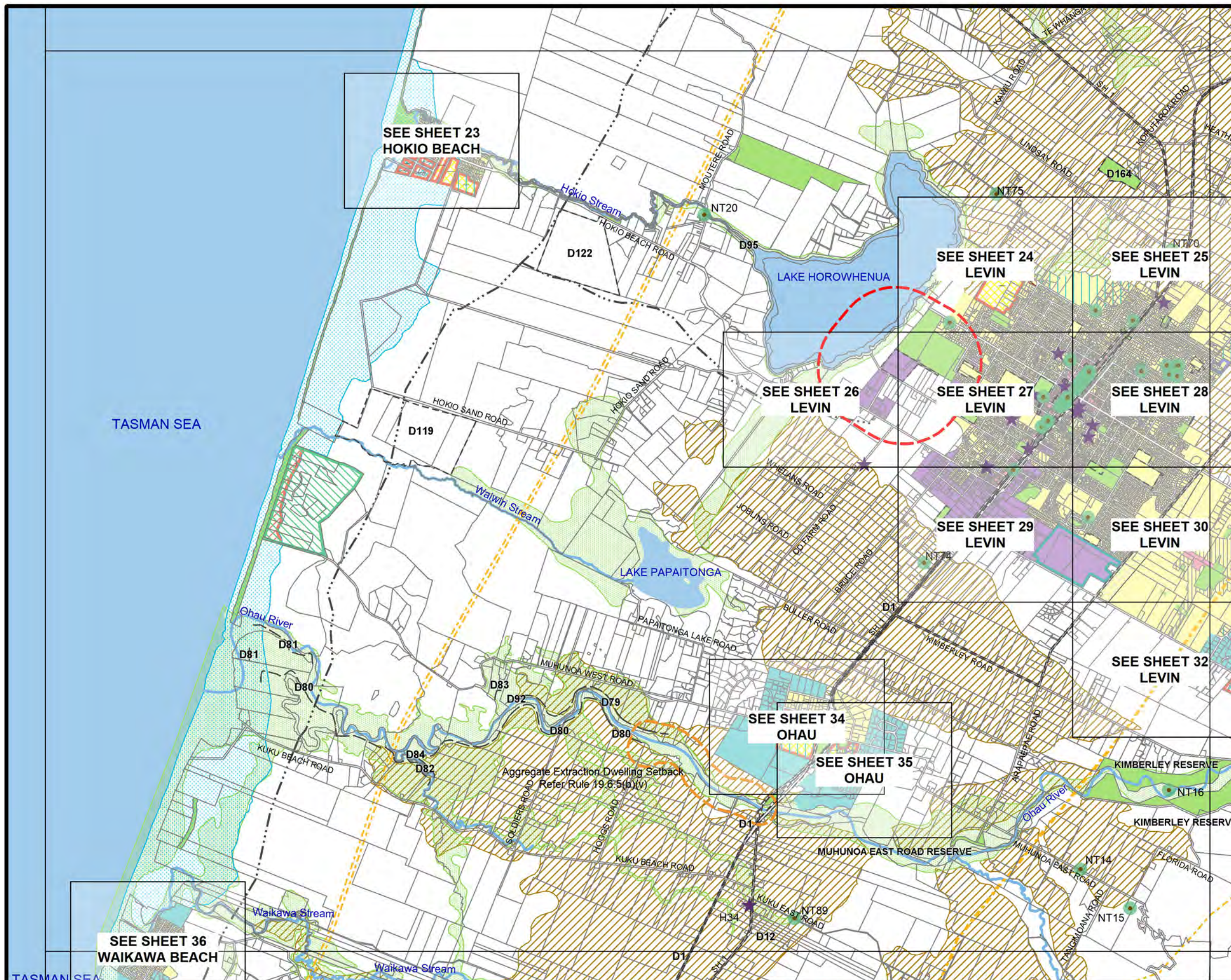
	Residential		Greenbelt Residential
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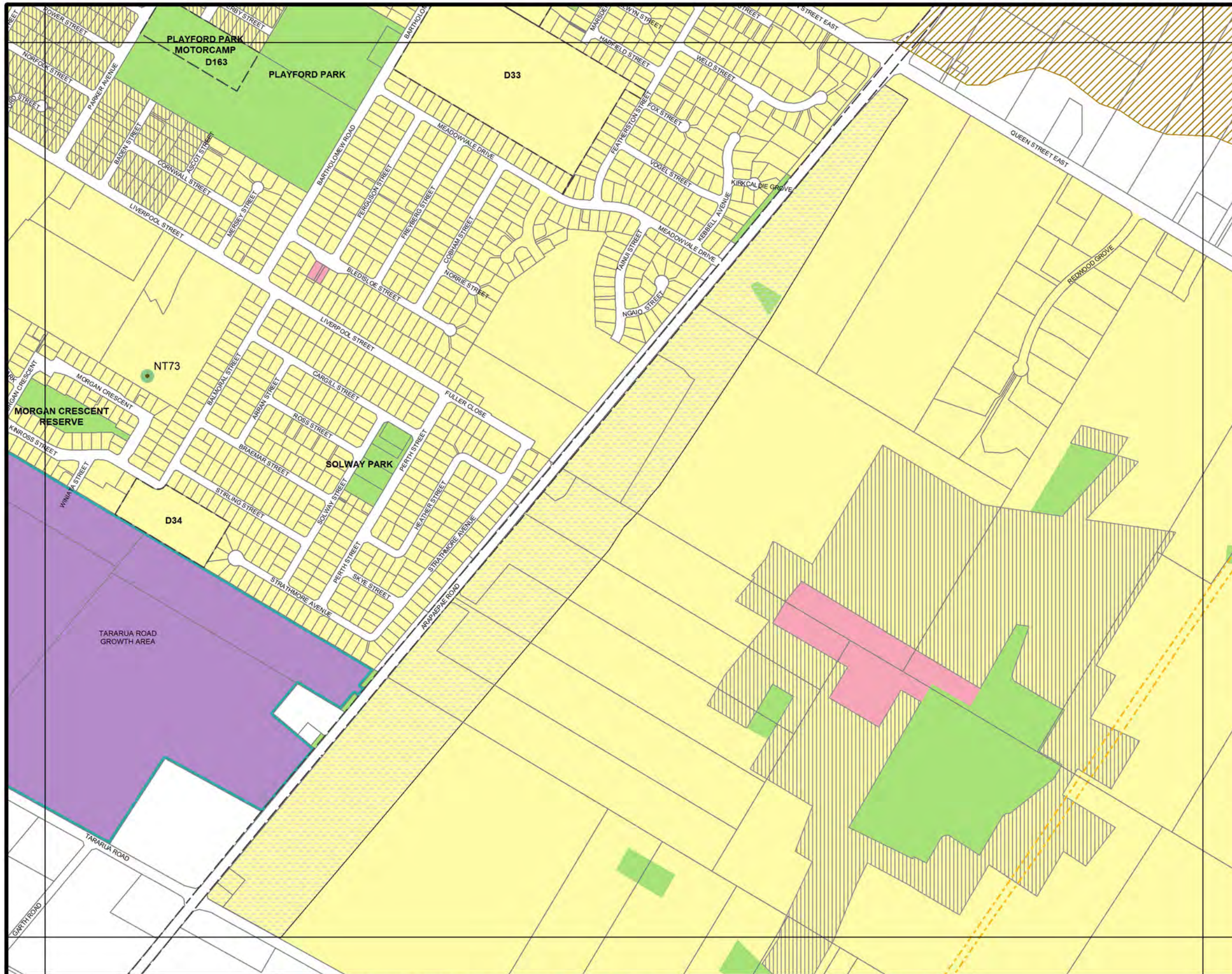
FEATURES

	Notable Tree
	Historic Heritage Building, Structure or Site
	Gas Transmission Pipeline
	National Grid Corridor (High Voltage Transmission Line)
	Designation
	Road



HOROWHENUA DISTRICT PLAN - PROPOSED PLAN CHANGE 4 RECOMMENDED CHANGES IN RESPONSE TO SUBMISSIONS RURAL

Planning Map 7



LEGEND

ZONES

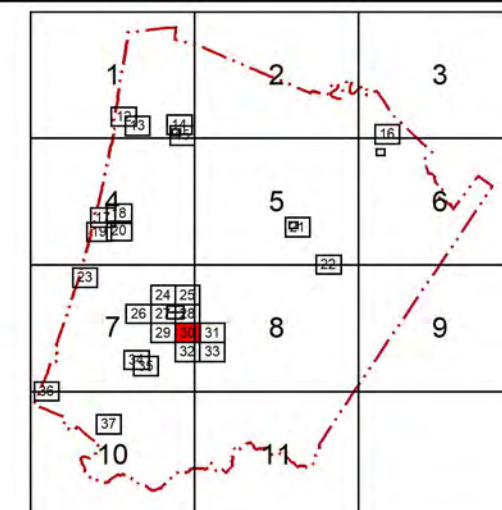
- | | |
|-------------|--------------------------------|
| Residential | Greenbelt Residential |
| Commercial | Greenbelt Residential Deferred |
| Industrial | Commercial Deferred |
| Open Space | Residential Deferred |
| Rural | |

OVERLAYS

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FEATURES

- Notable Tree
- Historic Heritage Building, Structure or Site
- Gas Transmission Pipeline
- National Grid Corridor (High Voltage Transmission Line)
- Designation
- Road



Appendix 4: Commercial Centres Assessment

URBACITY

August 20, 2021

Lauren Baddock
Strategic Planner
Horowhenua District Council

Dear Lauren,

Centres at Tara-ika

We wish to confirm the basis for the centre strategy, location and status for Tara-ika.

Determining the number and size of centres was iterative and interactive, reflecting urban design analysis, motorway location, role, and the centre's inspirational potential all played a part in establishing the strategy for Tara-ika.

There are a couple of "going-in" preferences before we started developing the centre rationale for the site.

1. The centre/s needed to be urban (street-based) as well as socially meaningful in the lives of those that will use it;
2. The centre is connected to the existing suburban fabric of Levin.

Retail and Services Role

On the practical side, we wanted to ensure that the centre/s in Tara-ika could be large enough to encourage high levels of community or social interaction. In other words, a dairy and another shop or two was not the basis under which we wanted centres to accumulate within Tara-ika. The desire was to generate centres that encouraged people to remain longer, with enough retail and services resources for future residents to be a daily or weekly trip destination.

On the physical side, we wanted the centre to be urban (street-based) and a physically attractive destination that reinforced walking as an essential dynamic in the centre's functioning. A response to walking means architecture with substantial vertical proportions, buildings directly addressing the street, reduced levels of glass, a series of conjoined but independent buildings common in conversation, parking behind etc.

Catchment

The Liverpool street extension option was the armature for the centre, extending it across Arapaepae Rd through Tara-ika to give a connected spine to existing suburbs east of SH1 and west of Tara-ika.

The motorway designation pushed the village centre to a relatively central location within Tara-ika. The determined structure gave it universally good access to all parts of the growth area and reasonable access to existing suburbs to the west.

Position Chosen and Effects

The resultant centre location and its dominant position central to Tara-ika meant that any additional centre within Tara-ika would live under the centre's shadow and struggle for relevance and viability.

Any other centre further east within the project would lose catchment density and become more and more counter-flow the further east its location. As the centre has an additional role of inspiring a more diverse and denser mix of housing, the justification for a more eastward (additional) centre began to fail.

Other locations were tested, such as somewhere along the south side of Queen Street, but such a centre would have only half a catchment and future growth on the north side of Queen Street is considered unlikely.

The other centre option is Tararua Road. Given that the city could grow on the southern side, there is a likelihood of a future centre locating on Tararua Road subject to land releases on its south side. This potential centre could serve some of Tara-ika and a new (but not yet approved) growth area.

Conclusions

The chosen centre site appropriately serves all of Tara-ika and some existing Levin suburbs east of SH1. Additional centres within Tara-ika cannot compete with or complement the proposed centre due to its size, role, location, and density distribution within the eastern parts of Tara-ika.

Yours sincerely,

Michael Cullen

Appendix 5: Statement of Evidence - Urban Design

BEFORE THE HEARINGS PANEL

In the Matter of: The Resource Management Act 1991

and Proposed Plan Change #4 Tara-Ika

Application by: Horowhenua District Council

EVIDENCE OF GRAEME MCINDOE

URBAN DESIGN

On behalf of Horowhenua District Council

12 August 2021

INTRODUCTION

Qualifications and experience

1. My name is Graeme Robert McIndoe. My qualifications are MA Urban Design; Dip. Urban Design (Dist.); BArch (Hons1); BBSoc. I am also a registered architect and Fellow of the New Zealand Institute of Architects.
2. I have 39 years experience in architecture, urban design and academia. In 1992 I founded my specialist urban design consultancy, now McIndoe Urban Ltd, which undertakes urban design work for private and public clients across New Zealand.
3. I chair Wellington City Council's Technical Advisory Group for the Wellington waterfront and am a member of Eke Panuku Development Auckland's Technical Advisory Group that provides urban design review and advice on the Wynyard Quarter and all 'Transform' projects across greater Auckland.
4. I have had extensive experience in planning for growth and master-planning. Residential projects include Waitarere Beach urban growth area (for HDC); in Palmerston North the Hokowhitu Campus and Roxburgh Crescent masterplans and district plan changes; master-planning in Auckland's Wynyard Quarter, Devonport, Bayswater and Onehunga Wharf; and a 700 lot greenfield masterplan north of Auckland. In addition, my firm is currently leading two greenfield masterplanning projects in Palmerston North that will provide a total of around 8,000 lots at Kakatangiata and Aukoutere, both for PNCC.

5. I contributed to conceptual planning, options development and design guide peer review for Hobsonville Point's Hudson and Sunderland Precincts; am currently assisting Porirua City Council with growth planning; and I chair the Nelson/Tasman Urban Design Panel which recently reviewed and approved a number of Special Housing Area projects for Nelson City.

6. I contributed to *People+Places+Spaces: A design guide for Urban New Zealand*. (MfE, 2002); wrote Wellington City Council's residential, subdivision and centres design guides; and was principal co-author of the MfE's *The Value of Urban Design*. My Crime Prevention Through Environmental Design (CPTED) experience includes co-authoring Wellington City Council's *Guidelines for Design Against Crime* and in 2005/2006 being a member of the Ministry of Justice's Leaders Group on the *National Taskforce for Community Violence Prevention*.

7. I have provided expert evidence on multiple occasions for projects from roading infrastructure through to public open space and building developments. This includes presenting to Boards of Inquiry for Auckland Council and Eke Panuku on Auckland's East-West Link, and for Wellington City Council on the Basin Reserve project. In addition to multiple plan change and consent hearings, I have presented evidence to the Environment Court over 20 times, including on the Three Kings Housing development in Auckland (for the Minister for the Environment) and for Auckland Council at the hearings on the residential sections of the Auckland Unitary Plan.

8. I was part of the team led by Local Landscape Architecture Collective in collaboration with Morphem Environmental and Urbacity that produced the masterplan for Tara-Ika. My involvement includes urban design inputs through all phases of the master-planning that began in late 2018 including:
 - the analysis that underpins the masterplan;
 - development of principles and multi-criteria assessment of master-planning responses to indicative O2NL alignments;
 - stakeholder consultation meetings;
 - masterplan conception, development and refinement; and
 - masterplan and structure plan adjustment in response to submissions.

Code of Conduct

9. I have read the Code of Conduct for expert witnesses in the Environment Court Practice Note. I agree to comply with this Code. The evidence in my statement is within my area of expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of evidence

10. This evidence provides a brief overview of the master-planning approach from an urban design perspective before focusing on the urban design related issues raised by submitters. I do not repeat the analysis that informed the master-planning nor describe the masterplan itself as that document is part of the notified information. Where a submitter has raised a matter within my area of expertise that I have not addressed in this statement of evidence this is not to be taken as acceptance of the matters raised.

MASTERPLANNING APPROACH

Process

11. The master-planning for Tara-Ika (then known as Gladstone Green) was a multi-disciplinary collaboration that began with a detailed site and context analysis which covered the following areas:
- Transport Connections
 - Urban Structure and Form
 - Culture and Heritage
 - Land Use
 - Land Ownership
 - Schools and Education
 - Open Space and Recreation
 - Vegetation and Ecology
 - Geotech and Natural Hazards
 - Services Infrastructure
 - Stormwater
 - Landform
 - Views Structure
12. While Tara-Ika is a defined area to the east of SH57/Arapaepae Road, its context includes both the immediate surroundings of this site and the wider extent of Levin and its surrounds. This includes its social context, servicing infrastructure including roading that connects with and extends through the site, and the broad regional landscape setting.

13. The master-planning process was informed by multiple expert and stakeholder consultations. Workshop sessions were held with HDC Councillors and disciplinary specialists as well as various institutional stakeholders including Waka Kotahi NZTA and the Ministry of Education. There was consultation with major landowners in a stakeholder reference group. Design and planning principles were developed at this stage. I consider that this first stage of ‘analysis and discovery’ including related stakeholder consultation was suitably comprehensive and provided a robust base for the master-planning that followed.
14. Scenario planning was undertaken for growth planning and urban development in relation to the three O2NL alignment options to respond to the uncertainty about the location and width of the expressway’s alignment where it crossed the Tara-Ika area. A fourth scenario, the baseline case of no O2NL and SH57 continuing in its current form, was completed for comparative purposes. Detailed investigations included planning detailed street and lot layouts for two O2NL alignments being the westernmost which was subsequently confirmed by Waka Kotahi, and also the easternmost alignment. Both of these detailed master-planning investigations were carried out prior to the Waka Kotahi NZTA decision on alignment. Masterplan delivery then followed and was consistent with that alignment decision.

Masterplan description

15. The plan is intended to deliver a new urban neighbourhood that provides a range of housing types and residential options to address current and ongoing housing demand for Levin. It is required to do this in a way that can be developed incrementally by a number of different landowners over time. The project focussed on reconciling all relevant cultural, social, environmental and economic drivers to provide a coordinated, well-serviced and high amenity outcome that will contribute to the well-being of its residents and the wider community. In order to achieve this the masterplan is based on nine ‘Key Moves’:
- Connectivity
 - Streets for people
 - Variety and choice of housing
 - A centre for community
 - Distinctive and memorable character
 - A network of parks and open space
 - Stormwater and ecology
 - Integrated services infrastructure
 - Planning for staged implementation

16. Principles are developed under each of these 'key moves' to direct the planning and design approach which is then described with a combination of text and diagrams, with all of these integrated into the masterplan and the subsequent structure plan.
17. I am confident that the notified masterplan provides for a well-serviced, high amenity outcome that is consistent with contemporary urban design best practice.

RESPONSE TO SUBMISSIONS

Location of roads relative to Redwood Grove

18. Various submissions on the location and alignment of roads close to Redwood Grove are addressed in turn.
19. Submitter 04/18.01 (S and T Jennings/Jennings Family Trust) oppose the location of the arterial road running from Queen Street East to the centre of Tara-Ika due to proximity to the existing Redwood Grove lifestyle development. In a related submission Tom Anderson, on behalf of identified Redwood Grove property owners (04/31.02), opposes the current position of the collector roads east and west of Redwood Grove. He submits that they will have an adverse effect on the amenity of the existing properties and that they should be at least 100m from the property boundary of any Redwood Grove property.
20. I recommend that these submissions be rejected for the following reasons:
 - a. The arterial road extending from the centre of Tara-Ika is required to link the new neighbourhood centre to Queen Street East and from there back towards Levin town centre in a reasonably direct way. Directness for the most important roads in the hierarchy is important for convenience and efficiency of movement, and to support wayfinding.
 - b. On position of the collector roads, 50kmh collector roads are established components of any urban neighbourhood. They will not have unreasonable adverse effects on the lots that front them, let alone on development separated from them by a full lot. In addition, to necessitate a 100m street separation would lead to many rear lots down rights of way which would be a poor urban design outcome, Alternatively very large or long narrow lots

might be provided which would be inefficient use of land in this well-serviced location reasonably close to the Tara-Ika centre and directly accessible from Queen Street East. Furthermore, locating the collector that is on the west of Redwood Grove 100m from the boundary risks compromising the extent of the setting for the Prouse Homestead.

21. Submitter 04/38.03 (Prouse Trust Partnership) seeks that:

- a. the road connecting Redwood Grove to their property is removed given Redwood Grove is already established; and
- b. the collector road running north-south through their property is changed to a local road to reduce impact on the heritage setting of the Prouse Homestead.

I recommend that this submission be rejected for the reasons below. In order of the points raised:

- a. The plan must provide for anticipated potential long-term development and the location of this potential connector is flexible. (See response to Redwood Grove below on this same point.)
- b. From a neighbourhood planning and urban design perspective intensive urban development of the Tara-Ika site necessitates a legible, and convenient direct connection through this land to Queen Street East. While the structure plan shows a 'fixed location', this is a high-level plan. As part of detailed engineering analysis, subdivision, streetscape and landscape design, the precise location, alignment and detailed design of this road would be confirmed in a way which both provides for residential subdivision and maintains the quality of the setting for the Prouse homestead. That design work would be undertaken by the landowner/subdivider and the road location assessed and confirmed by Council through the resource consent process.

22. Submitter 04/31.02 (Tom Anderson on behalf of identified Redwood Grove property owners) opposes the local road which connect Redwood Grove into the rest of Tara-Ika on the basis that the Redwood Grove properties are subject to a private covenant which prevents this from happening. I recommend that this submission be rejected for the following reasons:

- a. On local road connections, Redwood Grove has been overtaken by planned urban growth, and in the long term and subject to resolution of covenants, there may be further subdivision. Those local road connections describe the need to anticipate future connection should that further subdivision occur.

- b. If Redwood Grove were to be intensified it is desirable to provide convenient access to the residential areas around and on to the Tara-Ika centre.
- c. If streets were introduced to serve Redwood Grove residents developing their land, these would be minor local streets that can be expected to result in very low traffic volumes and speeds and have little impact on properties around. They may reduce some of any additional traffic that would otherwise be directed along Redwood Grove.

Redwood Grove screening

23. Submitter 04/31.07 (Tom Anderson on behalf of identified Redwood Grove property owners) seeks a screening provision along the boundaries of some Redwood Grove properties, ranging from a 6m wide buffer zone with native plants 3-5m high to a 2.1m high wooden paling fence at the boundary. I recommend that this submission be rejected for the following reasons:
- a. Should any owners of large 4,000m² lots in Redwood Grove have a concern with new residential development over their back fence, they have the space and opportunity to establish a planted boundary treatment should that not already be in place. The aerial photograph shows considerable planting already in place along much of the west and south boundaries of Redwood Grove properties which suggests that much boundary screening is already established.
 - b. The back-to-back lot arrangement anticipated by the Structure Plan is an optimal way of achieving a transition between residential areas of different character and intensity for any resident concerned that such a transition is necessary.

Location of central open space and school site

24. Submitter 04/18.02 (S and T Jennings / Jennings Family Trust) oppose the location of the greenspace and education site and contend these would be better positioned to border with Redwood Grove to produce a green space buffer between the larger Redwood Grove lots and new lots. I recommend that this submission be rejected for the following reasons:
- a. Variation in lot size does not justify a buffer treatment between residential areas.
 - b. The school and a significant public green open space need to be at or close to the neighbourhood centre. There, they strengthen the centre as a community and public destination and contribute to a memorable sense of

place for the centre. This is also an optimal location for serving the community around. Conversely placing these core community amenities at the periphery would compromise the centre and critically they would be distanced and relatively inaccessible from the southern parts of Tara-Ika.

Response to Maori culture and heritage

25. Submitter 04/35 (Muaūpoko Tribal Authority Inc.) are concerned that there is potential for urban development to impact on their spiritual pathways from their wāhi tapu in the Tararua Range to Taitoko [Levin], interrupting the connections and viewpath from the maunga to Punahau [Lake Horowhenua] and onwards to the moana. They seek assurances that the Plan Change will not result in built environment outcomes that disrupt important views, pathways and connections which are of significant importance to Muaūpoko.
26. The structure plan anticipates views eastward along the main east-west streets which are deliberately splayed to direct views towards the ranges, and connection is proposed to be supported by multiple bridges over the O2NL. These visual and physical connections are fundamental and are already integrated into the master-planning of Tara-Ika. The intent is described on page 6 of the Tara-Ika Design Rationale:

*Primary roads are the widest and are primary movement routes.
These are aligned to ensure easy physical connection, but also to
frame views to the Tararua Ranges.*

Figure 1 below describes these connections in plan, and figure 2 is an indicative perspective view from an elevated viewpoint along the central street.

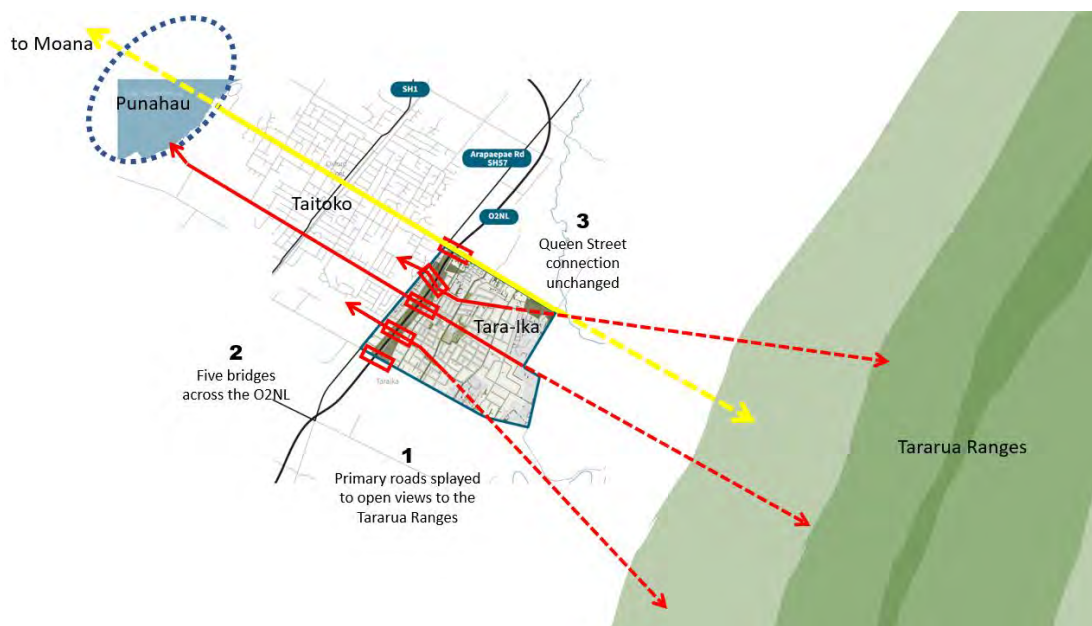


Figure 1: Analytical diagram of connections and views



Figure 2: Image showing a view towards the ranges extracted from the 'distinctive and memorable character' section of the masterplan (page 19)

27. The text in the masterplan is also explicit about recognising *“the special landscape values derived from views of the Tararua Ranges”* (page 18) and includes *“distinctive streets orientated and positioned to take advantage of views of the Tararua ranges”* (page 19).

Increasing extent of Residential zoning

28. Multiple submitters request increased intensity with up-zoning of land from lower intensity Residential zoning to 'General (standard) Residential' zoning. Changes have been requested by multiple submitters for reasons including more efficient use of land; urban development here to protect high class soils in other areas; and contributing to housing supply, thereby giving effect to the NPS Urban Development. I recommend that these submissions be accepted to the extent shown in the modified Structure Plan, for reasons identified but subject to qualification and conditions as below.

Reasons

29. In addition to responding to the weight of submissions and the arguments for those, taking standard 'Residential' zoning north along the full edge of Queen Street East and south along the full edge of Tararua Road future-proofs for any long term expansion of residential activity beyond those boundaries.

Qualification

30. The qualification to this extent of up-zoning is that the proposed 'Residential' zone extensions result in those portions outside the notified 'Residential' zone boundaries remaining largely vehicle dependant. This is, with reference to figure 3, and for reasons discussed below.



Figure 3: Distance to the neighbourhood centre. This records the distance from identified points at the edge of land zoned 'Residential' on the proposed Structure Plan, as revised to respond to submissions.

31. The notified structure plan calibrated zone boundaries for 'Medium Density Residential' to be around 400m and in some instances slightly more from the centre. 'Residential' zone boundaries were to be around 800m or in some instances slightly more. These dimensions follow generally accepted rules of thumb for walkability.
32. Interpreting pedestrian-shed (ped-shed) dimensions, how far a person is willing to walk can be considered to relate to the 'reward' at the destination including the nature of that destination and the time likely to be spent there. Therefore, a person might be willing to walk no further than 400m or 5 minutes to a small

local park but will travel further to a sports ground or to a school. A pedestrian may walk up to 800m for a 20 minute round trip to a local centre where there is a range of shops. However, many pedestrians are discouraged beyond that threshold, and are likely to instead travel by car or cycle. People who walk for exercise and/or to walk to work will be comfortable with walking much greater distances. As the local neighbourhood centre at Tara-Ika is unlikely to be a major workplace, and people who work there may or may not reside locally, the walk-to-work distance is not a determining consideration here.

33. Figure 3 records the distances to the neighbourhood centre from areas proposed to be up-zoned as a response to multiple submissions. The distances noted are scaled off the Structure Plan and are the shortest route along streets and, where applicable, across the O2NL corridor via the most convenient bridge.
34. This analysis demonstrates that the furthest parts of Tara-Ika proposed to be up-zoned to 'Residential' in response to submissions are located well beyond accepted ped-shed distances. Considering the distance to the centre from for example points C and H in figure 3, the distance to the outer edge of the extended Residential zone is increased by 700m (88%) beyond the commonly accepted 800m ped-shed dimension. Areas zoned 'Residential' at point I are a further 1,000m beyond the 800m ped-shed. This will lead to people living in these distant areas being increasingly reliant on vehicles, and for many this will be to the extent of vehicle dependence.
35. One implication of the increase in intensity and the number of dwellings possible here is whether this will be appropriately accessible to and serviced by the proposed neighbourhood centre and school. I consider that even with further intensification, the proposed centre remains in the correct location. Economic advice has also been received that the increased number of lots and population does not justify an additional centre or centres within Tara-Ika¹.
36. Should residential expansion occur beyond the Tara-Ika zone boundaries, that is on the northern side of Queen Street East and southern side of Tararua Road, additional local centres can and should (subject to commercial analysis on catchment and size) be provided in those new growth areas in the future. These future amenities would then both service and be supported by the population in

¹ [Appendix 4 of the s42a report](#)

the nearest parts of Tara-Ika; and would improve accessibility by active transport modes thereby reducing vehicle dependence for nearby residents.

37. The increasing reliance on vehicles for residents living beyond the 800m ped-shed from the Tara-Ika centre will be in part mitigated by ensuring the full network of dedicated cycleways is provided, adding more local parks and reserves, and the potential for local centres in any future residential growth areas close to but beyond the Tara-Ika zone boundaries.

Conditions

38. In order to mitigate in part increased reliance on vehicle travel in these up-zoned 'Residential' areas I consider the following conditions must be met:
- a. The full extent of the planned dedicated cycle lane access within Tara-Ika and to the neighbourhood centre is retained as described in the notified masterplan. To an extent the strategic cycleways can compensate for distance for those who are willing and able to cycle. As the cycleways become increasingly important as a means of giving people easy access to the neighbourhood centre without the need to drive, the importance of eliminating as far as possible vehicle crossings along frontages parallel to the cycle lane is emphasised, potentially but not necessarily with rear lanes.
 - b. Consequential amendments necessary to achieve a well-functioning environment are incorporated:
 - reconfiguring local streets in the masterplan to accommodate smaller lot sizes; and
 - adding local parks and reserves to provide for local recreation and stormwater management.
- These amendments are described on the masterplan and Structure Plan as revised.

39. I discuss below the rationale for the extent of zone change with relation to the locations referenced on figure 4.

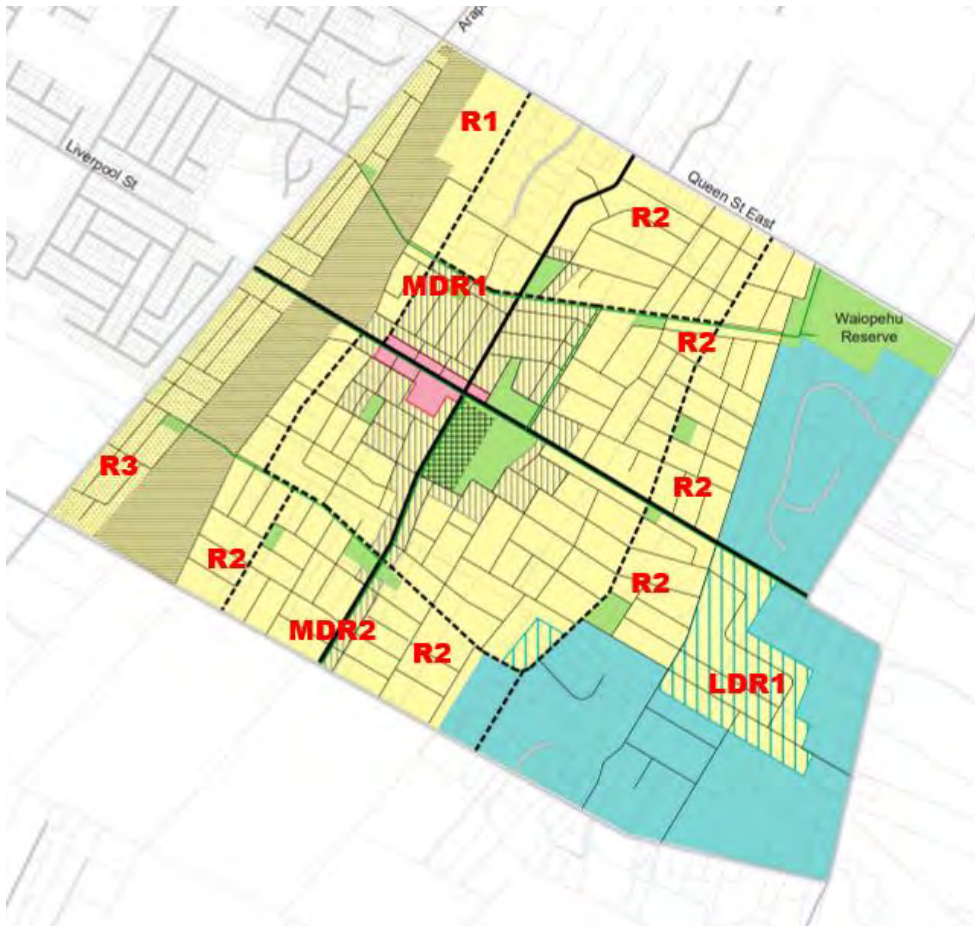


Figure 4: Location of recommended changes to zoning in response to submissions

40. Considering the identified areas in turn:

- a. R1 was notified as 'Low Density Residential'. Up-zoning to 'Residential' is justified by this being a pocket of lower intensity development reasonably close to the Tara-Ika neighbourhood centre (1,300m at its furthest point); on a part of the site closest to the Levin town centre; and in response to landowner as well as other more general submissions.
- b. R2 was notified as 'Low Density Residential' and in response to multiple submissions is now recommended to be up-zoned to 'Residential' for the reasons and with implications as outlined in the discussion above.
- c. R3 was notified as 'Low Density Residential'. In my opinion the only justification for this up-zoning to 'Residential' is continuity of zoning if the area to the north side of Arapae Road were to be zoned 'Residential' in the future. Otherwise, this area is compromised by its extended distance (up to 1,800m) from the Tara-Ika centre in combination with some potential amenity compromise due to its location of this area between SH57 and the O2NL.
- d. LDR1 was notified as 'Greenbelt Residential' and is now recommended to be up-zoned to 'Low Density Residential' to respond in part to submissions. I

support that up-zoning to an intensity that will achieve a transition between adjacent 'Residential' and 'Greenbelt Residential' zones but consider this area, a pocket of land within an existing 'Greenbelt Residential' zone, is unsuitable for 'Residential' zoning. This is because:

- This area is both peripheral and distant from the Tara-Ika centre. Locations more or less at the middle of this pocket and at the easternmost edge are around 1,700m and 2,100m respectively from the Tara-Ika centre.
- A secondary factor is that the existing large lot development in the surrounding zone compromises potential to achieve the street network connectivity desirable for good quality 'Residential' development.

Increasing extent of Medium Density Residential zoning

41. Submitter 04/25.02 (Horowhenua District Council officers) requests that identified areas to the north of the Tara-Ika centre that was proposed to be standard Residential be up-zoned to Medium Density Residential. (This is in the area identified on figure 3 as MDR1). This request is for the reasons of proximity to the centre, public open space and to the strategic cycleway route that will provide good access into Levin town centre. I recommend that this submission be accepted for those and the following reasons:

- a. The furthest Medium Density lot would be 650m from the identified centre, however being less than 400m from the edge of the area zoned 'Commercial' it remains in suitably close proximity.
- b. The extension of the zone northward to the collector road allows higher intensities on part of the zone where rear lane access is provided along the cycle lane, maximising the benefit/efficiency of that lane provision.

42. Submission 04/24.05 (Paul Turner for Haddon Preston) requests zoning changes for lots either side of the street extending from Taraika Centre south to Tararua Road (MDR2 on figure 3). The submission is that Medium Density Residential should extend as far south as Tararua Road on both sides of the proposed north-south arterial road here. I recommend accepting in part the submission to up-zone to Medium Density Residential as far as Tararua Road by up-zoning on the eastern side of the road which is proposed in the masterplan to be served by a rear access lane. That:

- a. Justifies and allows efficient and optimal use of land served by a rear access lane, in turn allowing the planned cycle lane to be free of multiple vehicle crossings²; and
- b. Avoids extending Medium Density Residential on the west side of the identified street beyond the notified distance of 735m from the Tara-Ika centre, where this is not served by a rear access lane.

43. The maximum distance of this Medium Density Zone from the Tara-Ika neighbourhood centre is some 250m further than the 800m ped shed. However, this up-zoning is justified if it contributes to enhancing the amenity, efficiency and safety of cycle lane access along this street which leads directly to the centre.

Mixed housing density and crime

44. Submitter 04/37.01 (Margaret Day) opposes having “low density housing next to very high density housing”, suggesting a link between high density housing and crime. I recommend that this submission be rejected for the following reasons:
- a. Changes in residential density are common both at neighbourhood level and along streets in urban areas across New Zealand, and there is no evidence that variation in residential density leads to crime.
 - b. If the submitter’s concern is based on a perception that the per-capita rate of crime for people in higher-density housing (such as the medium density housing which is being facilitated in parts of Tara-Ika) is higher than for people living in low density housing, I am not aware of any causal link between medium density housing per se and criminal activity. Considering a wide range of medium density housing developments and urban settings, neither have I experienced this as a matter of concern.
 - c. Assuming a theoretical proportion of the population might engage in criminal activities, all other things being equal, the presence of more people might be argued to commensurately increase the risk of criminal activity. Countering this, other CPTED experience suggests that the presence of more people providing informal community oversight over the public realm contributes to reducing crime.
 - d. A good quality environment, or in CPTED terms ‘image and milieu’ such as that intended, and neighbourhood features and amenities that facilitate

² Rule 15A.6.1 ‘Vehicle Access into Strategic Cycleways’ requires that: “No vehicle crossings shall cross a strategic cycleway shown on Structure Plan 013 will be permitted. In such cases, vehicle access to the site shall be via the rear access lanes shown on Structure Plan 013”

growth of a sense of ownership and community will tend to influence positive behaviour.

45. A further consideration is the benefit of mixed density including medium density housing which includes contribution to housing choice and affordability, efficient use of land and infrastructure, and the presence of sufficient population to support local amenities such as shops and a school.

Building bulk and location

Front boundary setback

46. Submitter 04/04.03 (Simon Austin) states that a 2m yard setback is very likely to be at odds with the aim of good urban design and should be increased to not seem “impoverished”. I recommend that this submission be rejected as the proposed 2m front yard setback offers the following benefits. It:
- a. allows for a greater proportion of each site to be used as private open space at the side or rear of the dwelling, thereby enhancing private amenity outcomes;
 - b. recognises the presence of street landscaping including trees along many streets which contribute to amenity; and
 - c. is sufficient to maintain privacy considering the full street width and any intervening street landscaping.
47. The 5m setback required for garages at the frontage is an exception to the 2m front yard setback and that is already in the district plan. This contributes positively to active street frontages. At the same time as reducing the visual impact of garage doors at the street edge, garage door setbacks encourage the occupied parts of the dwelling to be more visually prominent. This combination of setbacks is an approach that is consistent with best urban design practice.

Setback of integral garages

48. Truebridge Associates (submission 04/33) state that the rule requiring integral garages to be either recessed back from the main pedestrian entrance by 1m or account for no more than 50% of the front façade of the dwelling is a design guide issue. The submitter seeks for the design guide to be reviewed before including such as provision.

49. The 5m setback for garages apply to all dwellings. This rule is to ensure dwellings engage with and overlook the street and to avoid the visual dominance of garages and consequent visual monotony at the street edge. It contributes to visual amenity and overlook for informal surveillance and consequently safety. Therefore in my opinion the rule should be retained.

Policy for exceeding maximum height limits

50. Submitter 04/25.02 (Horowhenua District Council Officers) seek to introduce a policy relating to building height to cover buildings that may rise above the proposed permitted heights of 10m and 15m in the Medium Density and Commercial zones of Tara-Ika. That policy mentions 'viewshafts'. I recommend that this submission is addressed by a policy that covers relevant matters such as avoiding potential visual dominance and shading of sensitive adjacent areas, and design to achieve skyline articulation and scale moderation, but not 'the need to maintain the significant viewshafts'.

51. The reasons for this recommendation are:

- a. At Tara-Ika, views to the Tararua Ranges have already been explicitly provided for in the alignment of primary streets as described in figure 1 above. This is consistent with the use of viewshafts in district plans which are typically applied to significant views from public vantage points. These are often the view along the primary streets as with WCC's district plan viewshafts. (In Auckland's Unitary Plan, there are also 'volcanic viewshafts' which are the views to defined volcanic cones from identified vantage points.)
- b. In my experience which includes analysing viewshafts for Wellington City Council's district plan, the term 'viewshaft' has a technical meaning, being views of defined scope in a defined direction from an identified station point towards an identified 'object' or objects. While the 'object' here may be the Tararua Ranges, none of the other components are present and no district plan viewshafts have been identified for Tara-Ika.
- c. The alternative of open reference to 'viewshafts' without precise identification of these would mean considering views to any part of the ranges from any point within Tara-Ika. That would mean when a part of a building is above the permitted height and is visible in the foreground of any private view to the ranges from anywhere within the plan change area then it risks being inconsistent with the policy, even when there is no public benefit

in that particular private view. That would in my opinion be unduly onerous and also inconsistent with anticipating discretion to consider modest increases in building height in locations and in a way that does not compromise adjoining dwellings and/or public spaces.

- d. The recommended relevant matters have assessable and in the case of shading, measurable, effects across the site boundary and a direct relationship to residential amenity. Furthermore, when a viewer is at ground and located within an urban block views of the ranges will typically be blocked by buildings that comply with the building height limits. Any additional height above 10m or 15m is unlikely to have any effect on distant views other than on views of the sky.

Level of design control in the Commercial Zone (Taraika Precinct)

52. Submitter 04/33.09 (Truebridge Associates) objects to a requirement for resource consent in addition to complying with permitted standards. This arises from Rule 15A.3.3 'Commercial Zone' which is that 'development of new buildings and additions or external alterations to building frontages' is a restricted discretionary activity.
53. The objectives and policies for the Tara-Ika Multi-Zone Precinct (Chapter 6A) identify appropriately high aspirations for the centre including offering "*a high amenity 'focal point' for the community*"; "*ensuring a vibrant and attractive centre that the community will want to spend time in*" and in policy 6A.5.3 ensuring "*the design, nature, and scale of commercial activities contributes positively to the image and overall amenity of the commercial area of Taraika.*"
54. The standards for permitted activities in the Commercial Zone described in 15A.1.2 address activity type, signs and utilities, with signs further addressed in conditions for permitted activities 15A.6.3.1 Signs.³ Then further 'Conditions' are described under Rule 15A.8.2.1 for New Buildings and Additions/Alterations to Building Frontage. These are:
- All buildings in the Commercial Zone (Taraika Precinct) must comply with the following:*
- *No part of any building shall exceed a height of 15 metres.*
 - *All buildings shall be built to the front road boundary of the site.*

³ The permitted activity conditions within chapter 17 Rules: Commercial Zone also apply however generally address the same limited range of activities as 15.A.1.2.

- *All building shall be built up to the side boundaries (the boundary which is perpendicular to the primary road frontage).*
- *All buildings shall have display windows along the ground floor road frontage. At least 50% of ground floor facade surface shall be display space or transparent window or doors. The minimum window area shall be kept clear and not be boarded up, painted or covered by signage.*
- *No building shall have a continuous featureless façade/blank wall on the ground floor road frontage wider than 4 metres. A featureless façade or blank wall is a flat or curved wall surface without any openings, glazing or columns, recesses, niches or other architectural detailing.*
- *All buildings shall have a maximum ground floor road frontage width for individual tenancies of 15 metres.*
- *All building frontages shall have a minimum height of 6 metres.*
- *The above standards do not apply to service lane frontages.*

55. These standards are sound as far as they go but are not sufficient by themselves to achieve a sound result. They have been formulated to complement matters of discretion applied through a resource consent process and in my opinion this proposed combination of standards and assessment criteria is necessary to facilitate the quality of outcome intended for the Precinct.

56. The matters of discretion applying are covered in Rule 15A.8.2.1 New Buildings and Additions/Alterations to Building Frontage. This identifies qualities critical to the success of the centre including: quality of façade composition, visual interest, entrance legibility, relation to existing adjoining buildings, site design and layout, the overall appearance and pleasantness of the street, and CPTED. Rule 15A.8.2.2 Supermarkets and Rule 15A.8.2.3 Drive-Through Restaurants identify additional matters of visual amenity and pedestrian safety which are appropriately targeted to apply to these specialised vehicle-oriented retail activities.

57. These matters of discretion complement the above quantifiable standards, by addressing matters of quality which must be addressed if the policy direction on quality and amenity is to be achieved and that cannot be quantified or addressed by standards alone.

58. Standards alone carry a dual risk of on one hand being relatively ineffective in addressing quality, and on the other being restrictive. To prescribe with a standard one solution as a means of achieving a particular quality when many

equally acceptable or possibly enhanced solutions exist would be arbitrary. In contrast matters of discretion open up design options and flexibility in the way important qualities are achieved.

59. The Tara-Ika Commercial Zone has particular characteristics which reinforce the validity of this restricted discretionary approach:

- a. This centre is intended to define the identity Tara-Ika, be an attractive setting for the community and to have a high-quality public realm. These intentions demand greater care with design than may be acceptable in small centres elsewhere.
- b. As this is an open greenfield site, notwithstanding the siting-related standards, building design options are relatively open. These options include the potential prospect of poorly planned, designed and uncoordinated development that does not address the matters of visual and urban amenity to the degree intended. A building on a lot in a small local centres will respond to and to an extent be constrained by existing development adjacent. However the 'control' that arises from response to existing development won't apply to the initial development of this completely new neighbourhood centre.
- c. The zone is intended to provide for a supermarket. As a conspicuously large building with extensive carparking this will require particular care with building planning and design to ensure visual amenity and pedestrian safety.
- d. The extent of new public realm here and necessary rear service areas will demand careful consideration of public realm amenity and CPTED. These matters are and have been optimally addressed as matters of discretion.

CONCLUSIONS

60. The masterplan which underlies the plan change and structure plan is design led and principle-based, informed by a robust process of stakeholder consultation and is consistent with best-practice urban design.

61. There is no urban design justification for creating a low density residential environment around the edges of Redwood Grove, and the proposed collector roads are both optimally located and essential for a logical and legible interconnected network structure.

62. Extension of areas zoned 'Residential' close to the perimeter of the area in response to submissions contributes to urban growth potential and efficient use of land but is at a cost of increasing the number of lots that can be expected to be vehicle dependant.
63. Extension of 'Residential' zoning must be contingent on providing a more fine-grained block structure to allow for the smaller lots; additional green open spaces for recreational purposes and to contribute to stormwater management; and retention of the cycleways that are essential to provide suitable and safe access to the neighbourhood centre and school.
64. Extension on Medium Density Housing zone southward to Tararua Road and in the central north-west part of the site is supported, as these extensions remain reasonably close and directly accessible to the centre, are on cycle routes and are supported by notified and/or proposed additional green open spaces.
65. Celebrating public view connections to the Tararua Ranges is integrated into the masterplan and the Structure Plan that follows from it, negating the need for identification of 'viewshafts' as a matter of discretion in considering building heights.



Graeme McIndoe

12 August 2021

Appendix 6: Statement of Evidence - Landscape

BEFORE THE HEARINGS PANEL

In the Matter of: The Resource Management Act 1991

and Proposed Plan Change #4 Tara-ika

Application by: Horowhenua District Council

EVIDENCE OF DANIEL MALES

LANDSCAPE ARCHITECTURE

On behalf of Horowhenua District Council

11 October 2021

INTRODUCTION

1. My full name is Daniel George Males. I have a BA (Hons) in Landscape Architecture with 1st class honours and a Postgraduate Diploma with Distinction from Leeds Beckett University. I am also a Registered NZILA Landscape Architect.
2. I have 20 years' experience in the field of Landscape Architecture and in particular, strategic planning and design of public spaces. I am a Director at Local Landscape Architecture Collective Ltd (Local) which was established in 2018. Previously, I was a Principal at Isthmus Group Ltd where I worked in the Wellington Studio since 2006.
3. I have provided Landscape advice and design input into a number of comparable projects over the past decade most recently including:
 - Kākātangiata Masterplan, Palmerston North (2020-present)
 - Whisky Creek Masterplan, Palmerston North (2020-present)
 - Cannons Creek South East Masterplan, Porirua (2020-present)
 - Waitārere Beach Masterplan, Horowhenua. (2019- present)
 - Porirua Northern Growth Area - Plimmerton Farm, Porirua (2019-2020)
 - Wainuiomata Town Centre Framework and Streetscape Plan (2021)
 - Porirua City Centre Masterplan (2014- present)
 - Kenepuru, Porirua (2015-2018)
 - Silverbrooke, Porirua (2018-present)
 - Site 10 / North Kumutoto Public Realm, Wellington Waterfront (2008-2017)

4. I was part of the team at Local that led the masterplaning process in close collaboration with McIndoe Urban, Morphem Environmental and Urbacity. My involvement includes landscape architecture inputs through all phases of the master-planning that began in late 2018 including:
- the analysis that underpins the masterplan;
 - development of principles and multi-criteria assessment of master-planning responses to indicative O2NL alignments;
 - stakeholder consultation meetings;
 - masterplan conception, development and refinement; and
 - masterplan and structure plan adjustment in response to submissions.

CODE OF CONDUCT

5. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts, that I am aware of, that might alter or detract from the opinions that I express and that this evidence is within my area of expertise.

SCOPE OF EVIDENCE

6. I have been asked to provide evidence in relation to the landscape design of the Tara-Ika Masterplan. My evidence is based on the work carried out by Local in collaboration with, McIndoe Urban, Urbacity, and Morphem Environmental, on behalf of Horowhenua District Council.
7. The master-planning for Tara-Ika was a multi-disciplinary collaboration. My involvement in the design team was providing both Landscape Architecture expertise in site and context analysis and considerable input into the scenario planning, Masterplan and Structure Plan.
8. This evidence should be read in conjunction with the evidence of Graeme McIndoe who provides a good overview of the team's approach.
9. I am confident that the notified masterplan provides for a high amenity outcome that is informed by the site-specific landscape opportunities and constraints and the process and outcomes are consistent with landscape architecture best practice.

10. This evidence doesn't repeat the work that informed the master-planning, nor describe the masterplan itself, as that document is part of the notified information. Where a submitter has raised a matter within my area of expertise that I have not addressed in this statement of evidence, this is not to be taken as my acceptance of the matters raised.

RESPONSE TO SUBMISSIONS

STRATEGIC CYCLEWAYS

11. Location and design of strategic cycleways

Several submissions raise concerns regarding the location and design of strategic cycleways.

- a. Submitter 04/09 (Phillipa & Pasanka Wickremasinghe) support the integration of cycleways but suggest they should be relocated to the collector road, as this would likely allow them to be built earlier.
- b. Submitter 04/11 (John William Brown & Jeny Doreen Brown) support the use of strategic cycleways, but suggest relocating them to collector roads.
- c. Submitter 04/12 (Gwyneth Schibli) supports use of cycleways, but seeks that they are constructed in a timely manner and are not reliant on development occurring. Modifications to the route are suggested so that it follows fixed roads (North/South and East/West) and eliminate 'dog leg' near Waiopehu Reserve.
- d. Submitter 04/16 (Carol & Rob Bloomfield) suggests roads and cycleways should follow ownership boundaries.
- e. Submitter 04/22 (Gill Morgan) states the cycle network is disconnected and does not provide sufficient connections into Levin.

12. Comments:

Points a,b,c

I recommend that submission be rejected. The submission points relating to the buildability of the cycle network and fixed nature of the arterial and collector however it is also worth noting that that Structure Plan identifies and locates the

cycle connection. It is my recommendation that the cycleway locations are not shifted as they are positioned to provide maximum connectivity. The revised structure plan does however show a (minor alteration) tweak to the Waiopahu Reserve that provides additional reserve land, softening the 'dog leg' in this area without disturbing the existing bush area.

Point d

I recommend that submission be rejected. Roads and cycleways have been carefully designed to provide long term benefits while being cognisant of existing land ownership. Development has been designed to provide minimal dependence on neighbours to provide access to future lots.

Point e

While the structure plan does not show existing cycleways these are shown within the masterplan (page 11). The existing network along Queen Street East and Arapaepae Road provide for wider connections throughout Levin. I also note the inclusion of 'Strategic cycleways' does not preclude cycling on other roads, with local roads designed to connect into the Strategic cycle network.

13. Rear Access Lane

Several submitters raised concerns about Rule 15A.6.1.1(a), which states that *"No vehicle crossings shall cross a strategic cycleway shown on Structure Plan 013 will be permitted. In such cases, vehicle access to the site shall be via the rear access lanes shown on Structure Plan 013"*.

- a. Submitter 04/32 (Monique Leith on behalf of Leith Consulting) - seeks further consideration of the rule requiring rear access.

"It may be possible to have vehicle access from these collector roads without impacting on the safe and efficient functioning of the strategic cycleway routes. Requiring vehicle access from a rear access lane as a Permitted Activity Standard will likely deter development within some of these areas. Alternatively, if the above effects are consistently demonstrated through resource consents being approved for access from collector roads, the cumulative consented developments will result in widespread departure from the Structure Plan which, in turn, adversely impacts on the integrity of the Plan".

- b. Submitter 04/06 (Elisabeth Leighfield) - supports the concept that vehicles should not cross strategic cycleways, but opposes use of rear access lanes due to CPTED concerns. They suggest these lanes may become dimly lit havens for criminal activity and seeks examples of acceptable designs.
- c. Submitter 04/24 (Haddon Preston) suggest the removal of the rule requiring access via rear access lanes for properties fronting strategic cycleways and amend associated policy to allow more flexibility for creative design.
- d. Submitter 04/33 (Roger Truebridge on behalf of Truebridge Associates) opposes the non-complying activity status for vehicle crossings on Strategic Cycleways. The submitter states that there are a number of cycle and walkways with site access over them elsewhere in the district and that this activity status will slow or stop development in affected areas and suggests this should be allowed subject to a traffic assessment.

14. Comments:

Points a,b,c,d

I recommend that these submissions be rejected but that the wording of Rule 15A.6.1.1(a) be changed to:

*"No vehicle crossings shall cross a strategic cycleway shown on Structure Plan 013 will be permitted. In such cases, vehicle access to the site shall be via **side roads** **or** the rear access lanes shown on Structure Plan 013".*

The Strategic Cycleways have been designed as a best practice cycle route to accommodate both proficient and novice cyclists (including children to and from the future school). This rule was developed to ensure safety with a particular focus on integrating the commercial centre and education site (future school) with a network of safe cycleways. Separation from vehicle traffic is seen as key to ensure these routes are safe and attract as many users as possible. Conflict often arises where insufficient space is provided and driveways crossing these cycleways (particularly in areas of higher density housing where reversing manoeuvres are more likely) provide a safety concern.

Best practice health and safety advice is to eliminate hazards where possible. In a new master planned neighbourhood such as Tara-Ika this is entirely possible and

feasible. This is a far better approach than introducing engineering control measures to minimise risk.

We have revised the structure plan to allow the southern most cycleway to function without a rear lane. Through the reorientation of adjacent blocks this still ensures there are no driveways crossing the cycleway.

Recent private developments such as Kenepuru Landings in Porirua (shown below) illustrate that this is entirely feasible and consistent with good urban design outcomes including CPTED principles.



Figure 1: Kenepuru Landings, cycleway and rear access lane : image Carrus Corporation Ltd

OPEN SPACES AND VIEWS TO TARARUA RANGE

15. Submitter 04/16 (Carol & Rob Bloomfield) suggest that the design of open spaces should be considerate of existing property owners and not disturb existing views to the Tararua range.

16. Comments:

I recommend that this submission be rejected for the following reasons:

The structure plan anticipates views eastward along the main east-west streets, which are deliberately splayed to direct views towards the ranges along roads.

Open spaces are generally not positioned adjacent to existing dwellings and are positioned to provide visual, passive, and active amenity as well as stormwater and ecological opportunities. It is not envisioned that these will impede views any more than planting on private lots.

REDWOOD GROVE GREENSPACE BUFFER

17. Submitter 04/31 (Tom Anderson on behalf of Redwood Grove property owners) seeks provision for screening treatment between the existing Redwood Grove properties and any future development. The proposed treatment varies between a 6m wide planted buffer and a 2.1 timber paling fence

18. Comments:

I recommend that submission be rejected, existing properties in this area exceed 4000m² and the provision of a buffer outside of these properties is unnecessary. Some planting already exists within the larger lots within this area, if separation from new development is required, such a buffer is easily accommodated within the larger lots.

LOCATION OF CENTRAL OPEN SPACE AND SCHOOL SITE

19. Submitter 04/18 (S and T Jennings / Jennings Family Trust) suggests that the school site and associated primary open space should be located on the boundary with Redwood Grove to the north east of the site. The logic behind this suggestion is that the park and school site would provide a buffer to the existing large lot subdivision of Redwood Grove.

20. Comments:

I recommend that this submission be rejected for the following reasons:

The school and central open space have been located to;

- Reinforce the sense of community by locating the school in the heart of the neighbourhood,
- Be located in a well-connected central location,
- Provide amenity for higher density housing.

The Redwood Grove location is neither centrally located or in an area that is likely to have higher density housing.

RECOGNITION OF CULTURAL VALUES AND SITES

21. Submitter 04/35, (Di Rump on behalf of the Muaūopoko Tribal Authority) notes the immense importance of the Tara-Ika area to Muaūopoko, in particular the pathway between the Tararua Range and Punahau (Lake Horowhenua) and the Waiopahu Reserve. They are concerned about the potential impact upon the whenua, wai, and physical and visual interruptions to the spiritual pathway from their wahi-tapu in the Tararua Range to Taitoko (Levin).

22. Comments:

I fully support the recognition and sensitivities of the land, water, ecosystems and areas of cultural significance within Tara-Ika. The masterplaning design process aimed to identify these drivers to provide high amenity outcome that will contribute to the well-being of its residents and the wider community. The treatment of water and integration with open space design was a key driver in the masterplaning process (page 22). In addition (page 23) that Tara-Ika “identify and protect the Maunu Wāhine refuge and Waihau waterhole” I support these elements being as accurately located as possible and positioned in new reserves. Appropriate recognition of cultural sites and values will significantly aid the creation of a distinctive and memorable neighbourhood and should be developed in partnership with Muaūopoko.

DEMAND ON EXISTING RESERVES

23. Submitter 04/22 also expresses concern about increased population putting pressure on the Waiopahu reserve as a recreational area.

24. Comments:

Tara-Ika has been designed with a network of new open spaces and reserves to service the needs of the new community. In addition to this, the structure plan has been amended to include a 30m buffer to the Waiopahu Reserve to minimise and adverse impacts of development. This buffer is intended to serve an amenity

function, allowing the Wiaopehu Reserve to retain a predominantly ecological function.

FENCING

25. Submitter 04/33 (Roger Truebridge on behalf of Truebridge Associates)

expresses concern about points b and c of rule 15A.6.3.6. These rules limit the heights of boundary fences in different situations and are as follows:

- (b) Boundaries adjoining a public reserve or cycle way*
 - The maximum height of a closed style fence or wall sited on the boundary or within 1.2 metre from the boundary is 1m high*
 - Or*
 - The maximum height of an open pool style or trellis fence or wall sited on the boundary or within 1 metre from the boundary is 1.8m high*
- (c) Other Boundaries*
 - The maximum height of a fence or wall sited on the boundary or within 1 metre from the boundary shall not exceed 2 metres.*
 - Fences perpendicular to the road shall taper downwards towards the road boundary. The taper should commence at least 1.5m from the road boundary and the maximum height of the fence where it meets the road boundary shall be 1m high if the road is a local road, or 1.5m high if it is an arterial or collector road.*

26. Comments:

It is assumed the submitter is referring to the maximum fence height of 1m. Low fences along the identified boundary conditions are important in ensuring natural surveillance and creating a positive relationship between housing and the surrounding streets and open spaces. This height is a maximum and it is assumed that a standard 900mm picket paling would provide a fence with a height of less than 1m.


CONCLUSIONS

It is my opinion that the landscape design approach as outlined in the masterplan (which underlies the plan change and structure plan) is design led and principle-based. This was informed by a robust process of stakeholder consultation and is consistent with best-practice landscape architecture and design.

I understand the importance of this site to the Muaūopoko and believe that the recognition of the cultural values highlighted and sites identified are an asset to Tara-Ika and the region. I recommended these are incorporated into the Plan Change where appropriate.

To aid the buildability of the cycle network I recommend that the cycleway locations are not moved but all roadways associated with cycleways are identified as 'local roads -fixed location' to ensure connectivity.

The network of open spaces and cycleways provides significant benefit to the future of the neighbourhood and community. I do not support any reduction in the amenity of safety of these routes with the addition of driveway crossings.



Daniel Males

Local Landscape Architecture Collective

23 September 2021

Appendix 7: Water and Waste Water Capacity Assessment



Horowhenua District Council

Tara-Ika Residential Growth Area: Enabling Infrastructure Water and Wastewater Plants Capacity Assessment

September 2021

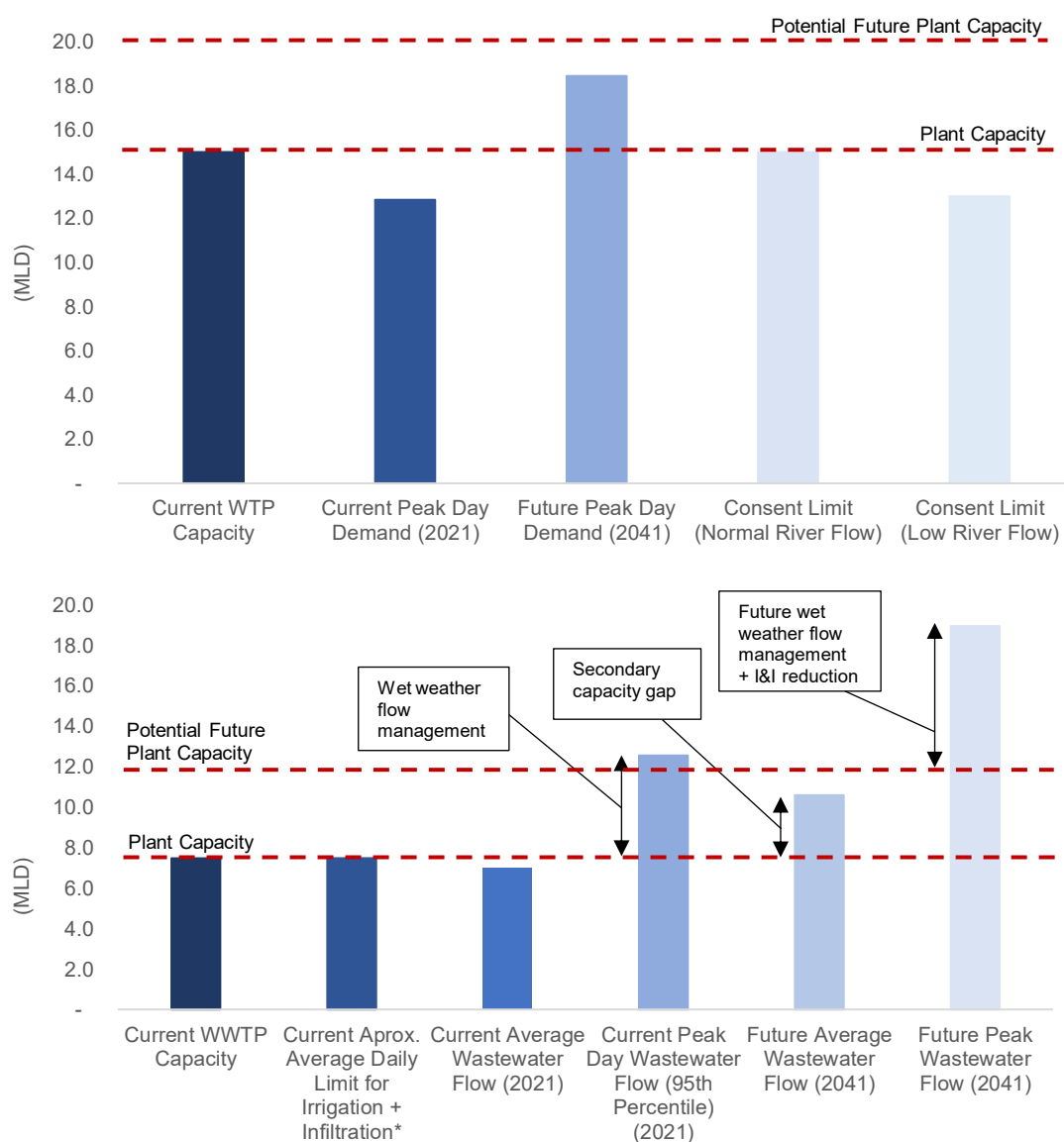
Executive summary

Tara-Ika is a new development area located to the East of State Highway 57, which is also known as Arapaepae Road. It is located adjacent to the Eastern boundary of urban development for the township of Levin.

The purpose of this report is to:

- Evaluate if the current capacities of Levin Water Treatment Plant (WTP) and Wastewater Treatment Plant (WWTP) are sufficient to service the new development and additional infill growth in the town; and
- Identify feasible pathways forward to upgrade these plants if additional treatment capacity is required.

Current capacities and future demands are summarised in the following figures (WTP followed by WWTP):



*Based on consent annual limit

From our capacity assessment, it can be concluded:

1. It is feasible to service the proposed Tara-Ika growth area from the current WTP system in the short term, until around 2030. Feasible upgrades are available to enable the water plant to service growth in the long term, and the plant upgrading process should start at least 2 years in advance (approximately by July 2028 at the latest).
2. The water source take consent and capacity are sufficient to service growth in Levin in the short term, until around 2030. Applying for higher abstraction limits would be required in the long term to enable the water system to service the full Tara-Ika development and any additional growth.
3. The consent to discharge return water back to the Ohau River is sufficient to service the estimated growth in Levin in the short term, until around 2032. Applying for a higher discharge limit would be required in the long term.
4. HDC's 2021-51 Infrastructure Strategy has earmarked a long term study to identify supplementary water source and supply. This will be part of the Water Master Planning for Levin and surrounding settlements, such as Ohau.
5. The existing WWTP and treated effluent irrigation system do not have sufficient capacity to service the full extent of the proposed Tara-Ika growth area and additional infill growth within Levin's urban area. It is feasible to undertake capacity upgrade of the Levin WWTP and the effluent irrigation system, however, investigations are recommended to establish the plant capacity with more certainty, and identify potential options resulting in short term capacity increase.
6. HDC has planned a wastewater master plan during 2021/22 to 2024/25 identify a staged work programme to develop services in Levin in short and long term. It is envisaged this master plan will cover wastewater collection, treatment and treated effluent discharge infrastructure.
7. In parallel to the wastewater master plan which will develop a short and long term programme, as noted in 5 above, there is a need to commence immediate improvements at the Levin WWTP and the treated effluent irrigation system to enable servicing of the Tara-Ika growth area. In addition, a consent planning assessment is recommended to identify the consenting strategy on increasing the volume limit of treated effluent to "the Pot".

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1. Introduction

1.1 Background

Tara-Ika is a residential growth area located to the East of State Highway 57, which is also known as Arapaepae Road. It is located adjacent to the Eastern boundary of urban development for the township of Levin.

The development of Tara-Ika aligns with Horowhenua District Council's Growth Strategy (Horowhenua Growth Strategy 2040) and the Wellington Regional Growth Framework (WRGF) which is adopted by all Councils in the Greater Wellington Region and Horowhenua District Council (HDC). Early discussions on the WRGF indicate the desire to house an additional 20,000 people in the Horowhenua District, and Tara-Ika is a key initiative to achieve this goal. The most likely scenario for Tara-Ika is to supply 2,500-3,500 lots which, assuming 2.6 occupants per section, will equate to 6,500-9,100 additional people in Levin.



Figure 1: Map indicating the position of Tara-Ika with respect to Levin

The strategy for servicing this development is outlined in the *3 Waters Infrastructure Plan - Taraika Master Plan* (July 2020). Broadly, it is proposed to connect Tara-Ika to the existing water and wastewater supplies of Levin. This report complements this previous study by:

- Evaluating if the current capacities of Levin Water Treatment Plant (WTP) and Wastewater Treatment Plant (WWTP) are sufficient to service the new development and additional infill growth in the town; and
- Identifying feasible pathways forward to upgrade these plants if additional treatment capacity is required.

1.2 Information & Assumptions

In undertaking this desktop capacity assessment, the following information and assumptions were utilised:

- A peak day water demand of 392 L/person/day for new residents in Levin. This is based on the current average water use in the Horowhenua District (300 L/person/day)¹ and the current peak factor (1.3) calculated from historical water consumption data.
- A peak day wastewater flow rate based on 447 L/person/day for lots. This is based on the ratio of measured average and 95th percentile flows to the Levin WWTP (1.8) applied to the design average flow of 250 L/person/day for new lots based on HDC's *Subdivision and Development Principles and Requirements*.
- One new dwelling per new lot, with an average occupancy of 2.6 people/dwelling.
- The ratio of treated effluent disposed of via infiltration remains constant (18% of the total treated effluent volume).
- Total growth in the number of dwellings in Levin of:
 - 213 new dwellings/year between 2021-2030; and
 - 337 new dwellings/year between 2031-2041.

This is based on the draft LTP 2021-2041 and includes the Tara-Ika development and infill growth. It has been assumed that the Tara-Ika development construction will be completed by 2041.

- No specific allowance has been made for additional non-residential connections (e.g. new industries) or other large-scale residential subdivisions, either zoned or unzoned in the current District Plan.

1.3 Limitations

This report has been prepared by GHD for Horowhenua District Council (HDC) and may only be used and relied on by Horowhenua District Council for the purpose agreed between GHD and the Horowhenua District Council as set out in Section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Horowhenua District Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer to Section 1.2). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Horowhenua District Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does

¹ Water New Zealand. (2019). *Residential Water Efficiency*. Available at https://www.waternz.org.nz/Category?Action=View&Category_id=1010

not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Existing Supply Summary

2.1 Water Supply

Levin is serviced by a WTP located to the southeast of the town and next to its water source - the Ohau River (see Figure 2).



Figure 2: Levin WTP location at Gladstone Rd, adjacent to the Ohau River

The plant was last upgraded in 2017 and broadly utilises the following treatment process:

- Coagulation/Flocculation
- Clarification
- Pressure Filtration
- UV Disinfection
- Chlorination
- Advanced Oxidation
- pH Adjustment

A new reservoir (6,800 m³) was constructed at the WTP in 2017 to provide buffer during dry periods when the river flow is low and increase the level of resilience of this water supply.

HDC has indicated that the plant has a maximum capacity of 15 MLD (plant outflow). Process capacity checks of the WTP were therefore excluded from the scope following discussions with HDC.

HDC currently holds a consent to take up to 15 MLD from the Ohau River, which is reduced to 13 MLD when the river level is low (at or below 0.82 m³/s). The consent authorises an additional take of up to 0.75 MLD for backwashing the filters and other activities (excluding water supply),

and this water must be discharged back to the Ohau River. The water abstraction consent is due for renewal in July 2042.

Daily Ohau River flow data measured at Rongomatane provided by HDC indicates that river flows below 0.82 m³/s are rare. From January 2005 to January 2019, there was only one event across six days (24/03/2008 to 29/03/2008) when the river flow was equal to or below this quantity.

The current average and peak water demand for the system are around 9.8 MLD and 12.8 MLD respectively. This is based on outflow data received over the period February 2018 to January 2021.

Figure 3 below compares the current water demand, WTP capacity, and consent abstraction limits related to Levin water supply scheme.

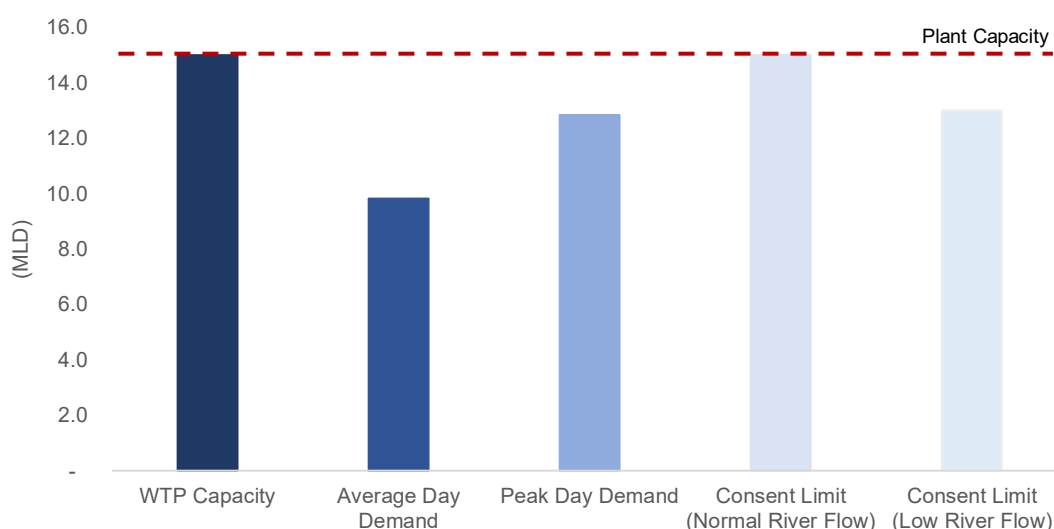


Figure 3: Levin WTP: Current demand, plant capacity, and consent limits

Based on this figure, the existing WTP has an additional capacity of 2.2 MLD beyond the current Peak Day Demand. Additional capacity is constrained by both the inherent process capacity of the WTP and also the consent limit.

Note that during low river levels, the capacity of the plant is further constrained, broadly to current Peak Day Demand figures, noting reservoir storage on site can assist in supplementing flows in the short term.

2.1.1 Backwash Water

As mentioned in Section 2.1, HDC can take up to 0.75 MLD of water from the Ohau River under the consent for backwashing the filters and other activities (excluding water supply), and this water must be returned to the river. HDC also holds a separate consent (ATH-1995003230.01 or 107374) to discharge up to 1MLD or 1000 m³/day of water back to the river - GHD has not sighted this discharge consent as part of this assessment.

Data from February 2018 to February 2021 indicates that the average daily amount of water used for filters backwashing and other activities in the water treatment plant is around 1.1 MLD. Some of this water is consumed at the plant (e.g. service water, carry water, building facilities, and water losses), and the remaining amount is returned to the river. As seen in Figure 4, the discharge volume has been generally below the 1 MLD consented limit. It was assumed that the discharge flow data provided by HDC came from the flowmeter at the discharge line to the river, post the backwash water settlement ponds. During the period shown in Figure 4, discharge flows to the river were higher than the consent limit for only 4 days or 0.4% of the time.

Therefore, discharges have been mostly compliant during this period. There is no data available for water flows to the river between 24/07/20 and 04/09/20.

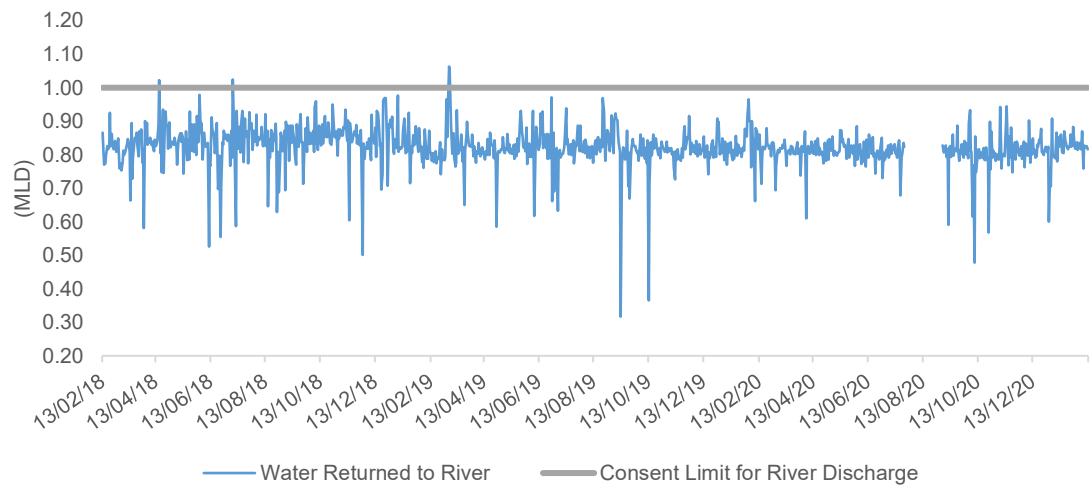


Figure 4: Backwash water returned to the Ohau River vs consent limit

Figure 5 below compares the historical total water take from February 2018 to February 2021 against the consent limits (valid from May 2017 to Jul 2042).

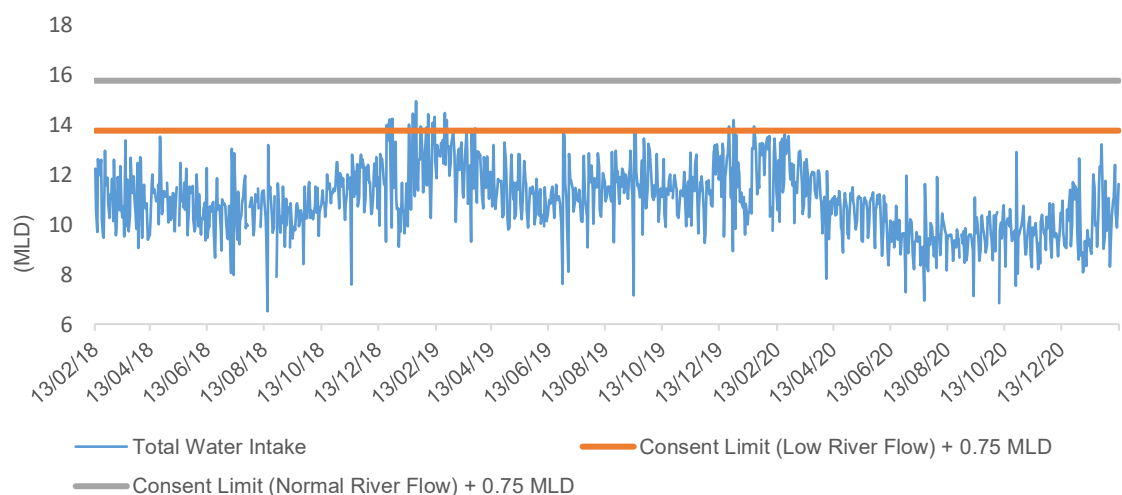


Figure 5: Total water intake in Levin WTP vs consent limits

During the period shown in Figure 5, the total daily water abstracted has been below the consent limit for when the Ohau River flow is normal.

The total water abstraction was above 13.75 MLD during summer 2018/19 and summer 2019/20. Ohau River flow data covering these periods was not available to determine if the lower consent limit was applicable; however it should be noted that the Ohau river flow seems to only rarely fall below 0.82 m³/s (see Section 2.1) based on the previous 14 years of data. Therefore, it is unlikely that the lower consent limit (13.75 MLD) was applicable during these peak water demand events.

2.2 Wastewater Treatment & Disposal

Levin is serviced by a WWTP located on the western edge of the town at Mako Mako Rd. Figure 6 shows an aerial view of the plant.



Figure 6: Levin WWTP: Aerial view of the equipment and site layout

The plant broadly utilises the following treatment process:

- Inlet screening and Grit Removal (Primary Treatment)
- Primary Clarification (Secondary Treatment)
- Biotrickling filters (Secondary Treatment)
- Secondary Clarification (Secondary Treatment)
- Aeration ponds (Tertiary)
- Treated effluent pump station to the “Pot”
- Sludge thickening tank (Solids Stream Treatment)
- Sludge digestion (Solids Stream Treatment)
- Sludge dewatering (Solids Stream Treatment)
- Diurnal and storm ponds for wet weather flow management

The wastewater catchment for the WWTP is primarily gravity flow. The treated wastewater is pumped to a storage pond, where a minority of the treated effluent infiltrates through the pond walls to the ground and the majority of the treated effluent is disposed of by spray irrigation on 40 ha of a 110 ha pine and native forest plantation known as ‘the Pot’. The Pot is situated approximately 5.2 kilometres west of the WWTP. HDC is currently in the process of optimising irrigation of the 40 ha of land currently being used, and there are plans to expand the irrigation area in ‘the Pot’ to 60 ha in the next two years².

² These changes are being driven by the resource consents. Refer to the ‘General Clauses’ related to the resource consents **ATH-201820041.00** (store wastewater and the associated discharge of wastewater to land and water); **ATH-1998004064.01** (discharge treated wastewater to land and water); and **ATH-1998007461.01** (discharge aerosols and odour to air).

2.2.1 Wastewater Treatment Current Performance

The estimated capacity of the Levin WWTP is 7.5 MLD. Details supporting this can be found in Section 2.2.3.

HDC currently holds a resource consent to discharge treated wastewater to land in 'The Pot'. This consent expires in June 2045.

A comparison between the consent limits and the current effluent quality is shown in Table 1. Effluent sampling results indicate that, on the average of samples taken, the plant is able to produce effluent quality within current resource consent limits. The median *E. Coli* result was at the consent limit (50,000).

Table 1 Levin WWTP effluent results summary (Apr to Jun 2020)¹

Parameter	Consent Limits ²	Effluent Quality (Median)	Effluent Quality (90th Percentile)
pH	≥ 6.8	7.5	7.7
cBOD5 (g/m ³)	≤ 40	23	37
TSS (g/m ³)	≤ 40	26	37
TN (g/m ³)	≤ 45	43	47
E. Coli (cfu/100 mL)	≤ 50,000	50,000 ³	198,000

1. Limited data was used (7 data points from 23/04/20 to 04/06/20). The secondary clarifier was out of service between Jan and Apr 2020, resulting in atypical effluent data results which were excluded from this analysis.
2. Based on the median of 5 samples.
3. Samples collected from Jan 20 to Feb 21, a total of 13 samples.

In addition to effluent quality requirements, other key consent limits are an annual discharge volume of up to 2,237,569 m³/year and a nitrogen load of up to 1,440 kg N/ha/year.

On the basis that 18% of the treated effluent infiltrates through the storage pond walls in 'the Pot' and the remaining amount is irrigated to land, the current volume for irrigation is understood to be approximately 6.1 MLD. The average and 95th percentile peak day inflow to the WWTP are 7.0 MLD and 12.6 MLD respectively. This is based on inflow data over the period February 2018 to January 2021. Figure 7 below compares the current plant wastewater flows and WWTP capacity.

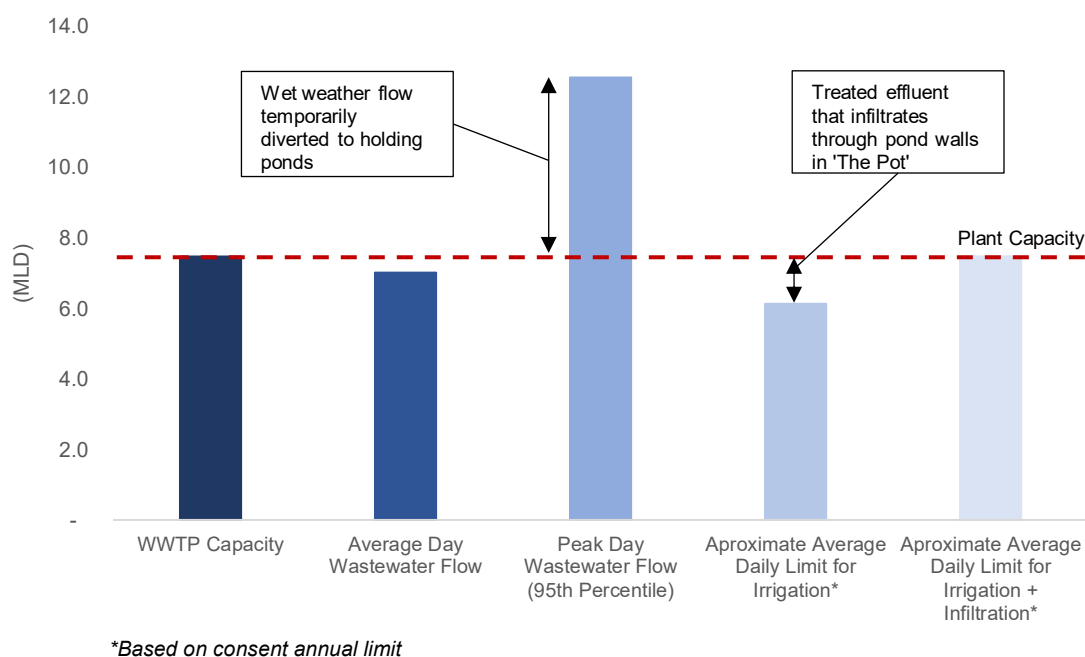


Figure 7: Levin WWTP: Current average and peak wastewater flows vs plant capacity

Based on the above figure, the existing Levin WWTP is currently operating with an additional capacity of 7% on average day demand, with excess wet weather flows diverted to holding ponds for temporary storage.

2.2.2 Treated Effluent Disposal

Figure 8 and Figure 9 below show the current annual nitrogen load applied per hectare of irrigated land in 'The Pot' and the current annual volume of treated effluent discharged against the consent limits. It should be noted that the consent limits presented below will commence 18 months after the consent was granted in June 2020 (i.e. December 2021).

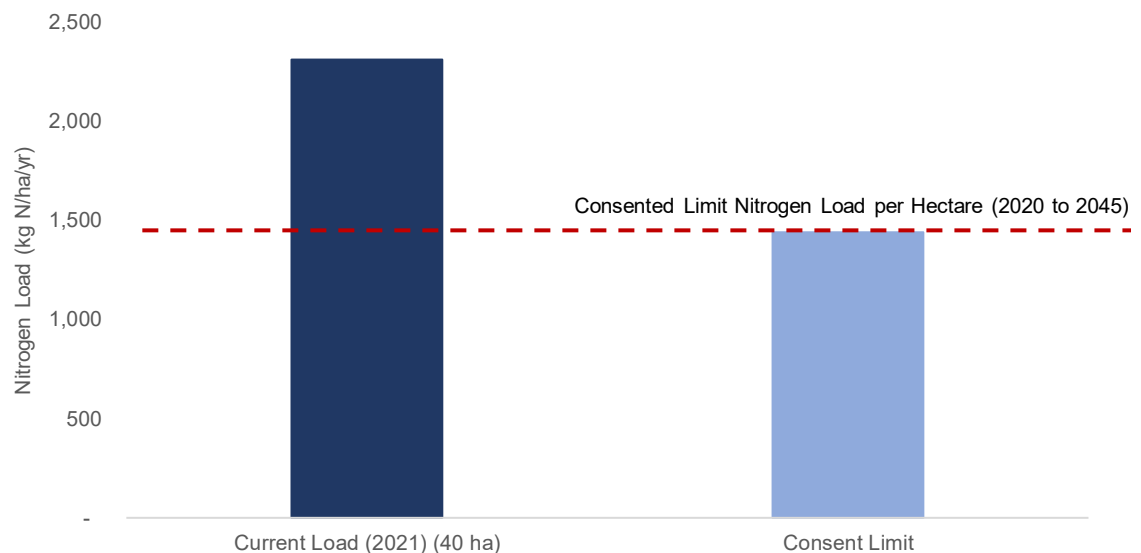
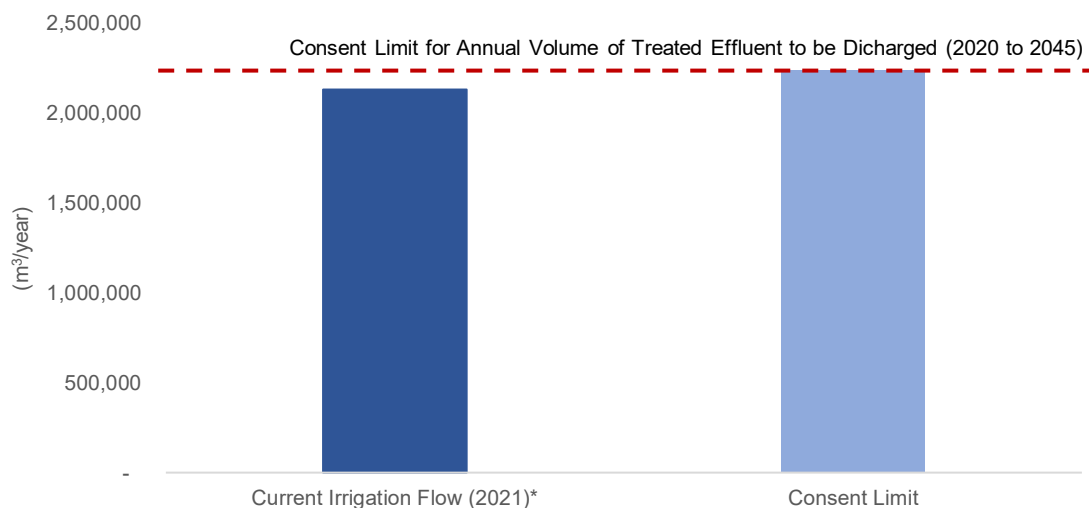


Figure 8: **Disposal of treated effluent in 'The Pot':** Current nitrogen load per hectare vs consent limit



*Assumes 18% of the treated effluent infiltrates through the pond walls in 'The Pot'

Figure 9: **Disposal of treated effluent in 'The Pot':** Current annual irrigation flow vs consent limit

Based on the total annual effluent flow for the 2019/20 consent year (2,597,388 m³/year) and the average effluent total nitrogen concentration (43.4 mg/L), the annual nitrogen load applied to the irrigation area (40 ha) in 'the Pot' is currently higher than the consent limit (1,440 kg N/ha/yr). This assumes that 18% of the treated effluent is discharged by infiltration through the walls of the storage pond located in 'the Pot', as per the assumptions made in the

resource consent application. Furthermore, the current annual volume of treated effluent discharged in 'The Pot' is approaching the consented limit for annual treated effluent volume of 2,237,569 m³/year.

2.2.3 Capacity Checks

To verify the capacity of the WWTP, GHD has undertaken high-level process calculations around the major process units, summarised in Table 2.

Table 2 Levin WWTP: Capacity of key equipment

Treatment Process Type	Equipment	Capacity	Current Utilisation Based on Average Flow
Liquid Treatment	Primary clarifier ¹	Max Daily Flow: 75,400 m ³ /day ⁴ Average Flow: 27,000 m ³ /day (2 clarifiers) 13,500 m ³ /day (1 clarifier)	52% (1 Clarifier)
	Trickling filters ²	Average: 7,500 m ³ /day ⁵	94%
	Secondary clarifier ³	Max Daily Flow: 18,700 m ³ /day ⁴ Average Flow: 9400 m ³ /day	75%
Solid Treatment	Sludge digester ⁶	Volume: 1,570 m ³	68%
	Sludge press	900 kg/day (vendor)	73%

Notes:

1. Two Primary Clarifiers, 24 m diameter. Currently only one clarifier is in use.

2. Six Trickling Filters, 14 m diameter, 1.8 m media depth assumed.

3. One Secondary Clarifier in operation, 24.4 m diameter.

4. Based on permitted maximum daily clarifier rise rate and average daily clarifier rise rate of 80 and 30 m/day respectively. It is noted that excess storm flows are temporarily diverted to holding ponds.

5. Based on permitted average organic loading rate of 0.8 kgBOD₅/m³.day, and current primary clarifier effluent BOD₅ of 178 mg/L.

6. Based on minimum digester retention time of 25 days on average.

Based on these calculations, the estimated plant capacity is around 7.5 MLD, which is broadly consistent with current average day inflows. The plant capacity is limited by the maximum BOD loading onto the trickling filters.

During extreme events, wastewater is temporarily diverted to holding ponds. It is understood that these ponds are used for storage in emergency situations only and are not designed or suited to regularly store raw wastewater. Holding ponds are therefore not considered in the plant capacity assessment but in practice will provide a buffering effect to plant inflows when used.

Additional investigations are recommended to identify process bottlenecks and improvement options.

3. Future Servicing

3.1 Tara-Ika Growth Area

At full build-out, the Tara-Ika Growth Area is planned to have from 2,500 to 3,500 additional lots. The new properties would be serviced by the existing Levin water and wastewater plants and networks. Considering a house occupancy of 2.6 people/dwelling, this would result in an estimated additional demand of 6,500 to 9,100 population equivalent, or an increase in peak demand of:

- 2.5 – 3.6 MLD for water services; and
- 2.9 – 4.1 MLD for wastewater services

It is important to note that residences in the new development will include rainwater tanks to be plumbed into internal non-potable uses. These will reduce the annual water demand in terms of volume required by each property. However, rainwater tanks cannot be relied on to meet demand during peak summer periods – a combination of low rainfall and high water demand during summer can lead rainwater tanks to be empty. Therefore, properties with rainwater tanks still rely on water supplied by Council to meet their needs throughout the year. Taking this into account, the additional capacity of rainwater tanks was excluded for this study.

3.2 Levin Infill Growth

In parallel to the growth in the Tara-Ika Growth Area, HDC anticipates other developments to occur within the current Levin urban boundaries. Water and wastewater services will need to accommodate this growth in addition to the proposed Tara-Ika growth.

The current draft HDC Long Term Plan 2021-2041 predicts a total growth (including Tara-Ika) of:

- 213 new dwellings/year between 2021-2030; and
- 337 new dwellings/year between 2031-2041.

Considering that the Tara-Ika development construction (2,500-3,500 houses) will be completed by 2041, the infill growth is expected to be equivalent to around 2,000-3,000 new dwellings in the next 20 years. Applying a house occupancy of 2.6 people/dwelling, this will result in additional demand of 5,200 - 7,800 population equivalent, or an increase in peak demand of:

- 2.0 – 3.1 MLD for water services; and
- 2.3 - 3.5 MLD for wastewater services

No allowance has been made for additional non-residential connections (e.g. new industries) or other large-scale subdivisions (e.g. retirement villages) which have not been considered in the HDC Long Term Plan 2021-2041.

4. Upgrades Planned to Date

Currently, there is budget assigned for capacity and treatment upgrades of the Levin water and wastewater plants in HDC's draft LTP 2021-2041 and Infrastructure Strategy 2021-2051.

The main ongoing and future projects related to increasing the capacities of the Levin plants, improving treatment, and managing or reducing water demand are presented in the tables below.

Additional projects may be required to facilitate the implementation of the Tara-Ika development. Initial requirements for projects and studies have been indicated as a result of this study (please refer to Sections 5.3 and 6.3); additional work is required in all the instances to better define all projects that need to be undertaken to service the projected growth within the Levin urban borders.

Table 3 Future water projects in Levin

Project	Budget	Timeframe
Levin WTP Improvement Plan: Capacity Upgrades and Water Demand Initiatives	\$18.3m	2021 – 2051 (To be better defined based on this study. Refer to Sections 5.4 and 6.4)
Greater Levin: New Water Source Options and Investigation Project (Future-proofing Levin's water management and infrastructure to provide for projected growth and development to 2041 and beyond)		
Consents Renewal		
New Water Reservoir (Buffer When Ohau River Flow is Low)	Unknown	Ongoing
Develop Master Plan for Levin Water Supply and Associated Implementation Programme	Unknown	2021-2022

Table 4 Future wastewater projects in Levin

Project	Budget	Timeframe
Develop Wastewater Master Plan for Greater Levin. This will include optioning, staging of works, and any necessary consenting	\$400k	2021 – 2025 (If necessary work can be brought forward)
WWTP Renewals to Improve Level of Service	\$10.4m	2021 - 2041
WWTP Renewals to Increase Capacity	\$4.5m	2021 - 2041
WWTP Strategic Upgrade to Improve Level of Service	\$18.0m	2029 - 2035
WWTP Strategic Upgrade to Increase Capacity	\$26.9m	2029 - 2034
Treated Effluent Discharge System Upgrade to Improve Level of Service (The Pot)	\$18.1m	2021 - 2041
Treated Effluent Discharge System Expansion (The Pot)	\$12.2m	2021 - 2041

5. WTP Ability to Service

5.1 Current and Future Demand vs Plant Capacity

Figure 10 summarises the capacity of the current WTP to service the Tara-Ika growth and infill growth in Levin in the next 20 years.

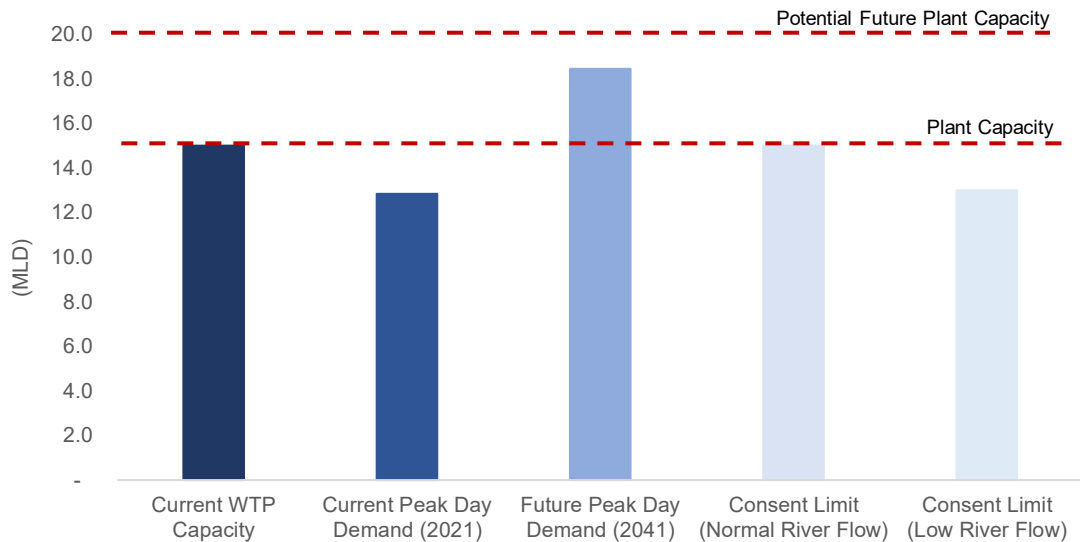


Figure 10: WTP Capacity to service future growth in Levin

According to the estimates above, the current WTP does not have enough capacity to fully service the Tara-Ika development and additional infill growth as forecasted in the LTP. The estimated gap between treatment capacity and demand in 2041 reaches 3.4 MLD on peak days.

The estimated impact of growth on the water demand through the next 20 years is illustrated in Figure 11.

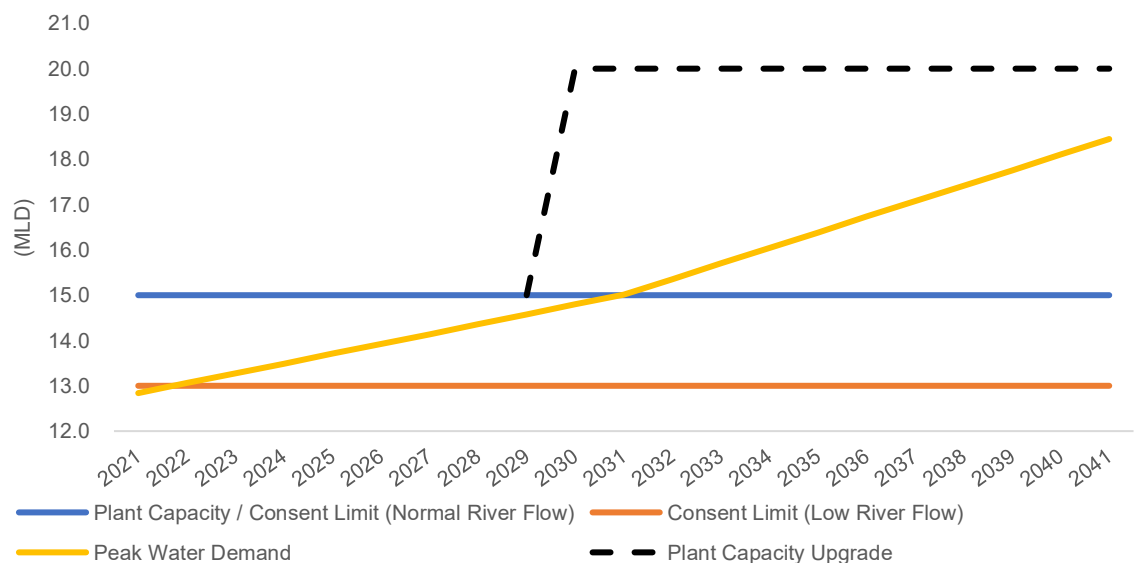


Figure 11: Estimated future water demand from 2021 - 2041 against water take consented volume and current WTP capacity

According to the preliminary forecast above, the WTP will be required to be upgraded by around 2030. The water demand is expected to reach the 15 MLD limit by the end of 2031.

5.2 Backwash Water

Figure 12 below shows the estimated average volume of water to be discharged to the Ohau River over the next 20 years. The volume of water to be discharged was considered to be proportional to the increase in the average water demand estimated for each year.

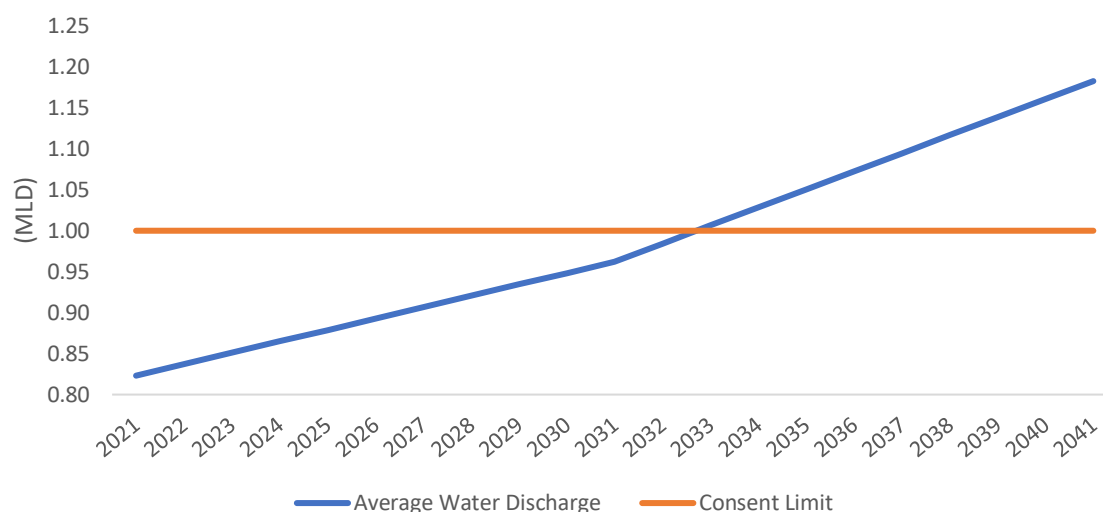


Figure 12: Estimated average volume of water to be discharged to the Ohau River vs consent limit

As shown in the above figure, the estimated discharge volume in 2041 could reach 1.2 MLD, which is above the current consent limit of 1 MLD. Increasing the permitted return water volume in the consent is likely to be required before 2033, when the average volume of water to be discharged is expected to reach 1 MLD. It has been assumed that peak backwash volumes can be buffered by the two existing backwash water settlement ponds.

It is understood that most of the water currently discharged to the river is backwash water. This means that HDC may also want to consider applying to increase their consented allowance for additional water take for backwashing (0.75 MLD). In order to do that, it is recommended that HDC undertakes further investigations to understand which amount of the additional water take is used for backwashing, and which amount of the water returned to the river is backwash water.

5.3 Recommendations to Enable Servicing of Future Growth

The following is recommended to enable the Levin water supply system to service future growth:

- HDC should consider undertaking additional assessments to confirm the WTP's capacity – note the capacity of this plant was not verified as part of this assessment.
- Upgrade the WTP to increase its capacity. A capacity gap of up to 3.4 MLD was identified, and a nominal upgrade of 5 MLD is recommended to cover this gap as a practicable upgrade quantum.
- Allow at least 2 years for the plant capacity upgrading process, including consultant engagement, scoping, tendering, design, and construction, and a 1-year buffer prior to predicted growth being reached.
- Apply for a higher water abstraction limit before the expected renewal date at the end of the consent period (July 2042). Based on the preliminary demand forecast in Figure 11, this is needed to be in place by 2030.

- If it is not possible to increase the amount of water abstracted from the river (currently 15 MLD), it will be necessary to find a supplementary water source, as indicated in HDC's 2021-51 Infrastructure Strategy.
- If it is not possible to increase the amount of water abstracted from the river when the river flow is low (currently 13 MLD), it might be necessary to increase the raw water storage or find a supplementary water source. A 6,800 m³ treated water reservoir was built in 2017 to provide buffer when the river flow is low and it is understood that the planning of an additional raw water storage pond is underway. Further studies are recommended to evaluate if this storage is sufficient to provide buffer in the future – these should consider the expected increase in water demand and the level of service HDC requires during such events.
- The Ohau River flow seems to be rarely at or below 0.82 m³/s. From January 2005 to January 2019, there was just one six-day period (24/03/2008 to 29/03/2008) when this happened. Considering that the effects of climate change may increase the frequency and duration of droughts in New Zealand, having a water abstraction limit above the future peak demand is highly preferred.
- Apply for a higher limit for water discharge to the Ohau River by the end of 2032. Take into consideration that the water take consent, due for renewal in 2042, may introduce future requirements which will need to be accommodated with an upgrade at the time.

It is important to note that many of these recommended actions can use budget which has already been allocated in the HDC's draft LTP 2021-2041. Refer to Table 3.

5.4 Notional Timeframes

5.4.1 WTP Capacity

It is recommended that the WTP is upgraded to 20 MLD in the **2029/30 financial year**. It is estimated that the peak day demand could exceed the rated plant capacity by the end of 2031. In this case, it would be recommended to start the plant upgrading process by **July 2028** at the latest.

Budget to improve the water source (incl. looking for an additional source if necessary) and increase the WTP capacity have already been included in the draft LTP 2021-2041 and Infrastructure Strategy 2021-2051 (see Section 3). Part of the budget may have to be brought forward.

5.4.2 Abstraction Capacity

It is recommended to apply for an increased water abstraction limit on time to get it approved by the **end of 2030**, before water demand reaches 15 MLD in 2031 (see Figure 11). Applying for a higher allowance for additional water take for backwashing is also recommended. Further investigations are required to determine the exact amount of water currently being used for filter backwashing and other activities in the plant and future water requirements to inform this application.

5.4.3 Water Discharge

As shown in Figure 12, it is estimated that the volume of water to be discharged to the Ohau River will reach the consent limit in 2033. Therefore, it is recommended to apply for a higher discharge limit on time to get it approved by the **end of 2032**.

6. WWTP Ability to Service

6.1 Current and Future Demand vs Plant Capacity

Figure 13 summarises the capacity of the current WWTP to service the Tara-Ika growth and infill growth in Levin over the next 20 years.

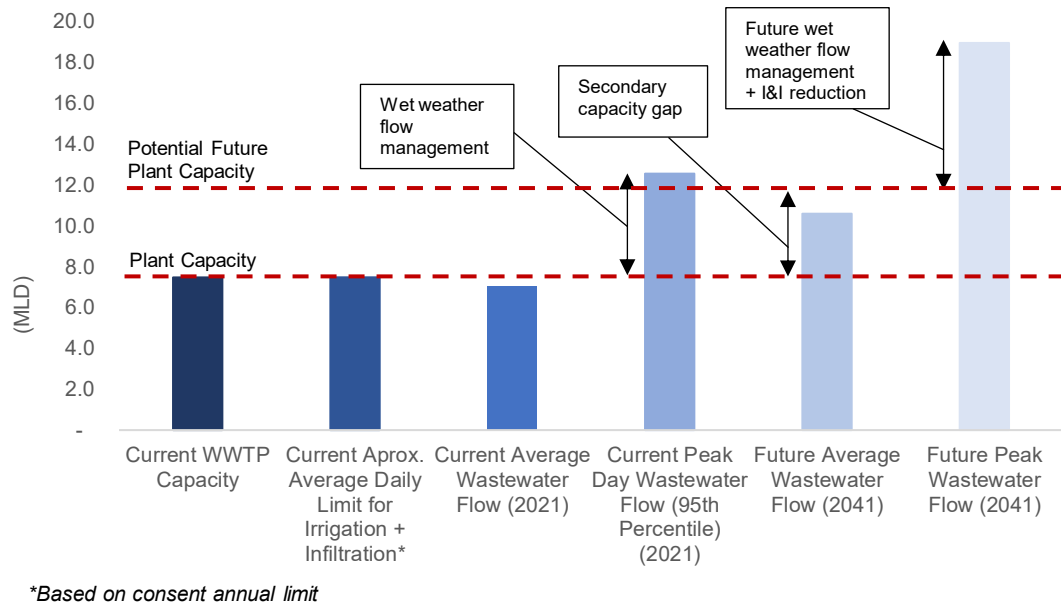


Figure 13: WWTP Capacity to service future growth in Levin

According to this figure, the current WWTP is currently at capacity and cannot service the Tara-Ika development and additional infill growth in Levin without capacity and treatment upgrades. A treatment capacity vs demand gap of up to 3.1 MLD has been estimated for 2041 (based on the average future wastewater flow). It should be noticed that wet weather flow management will require further improvements in the future; for example, Infiltration and Inflow (I&I) reduction initiatives can help to reduce the future peak wastewater flow.

The estimated impact of growth on the wastewater flows over the next 20 years is illustrated in Figure 14.

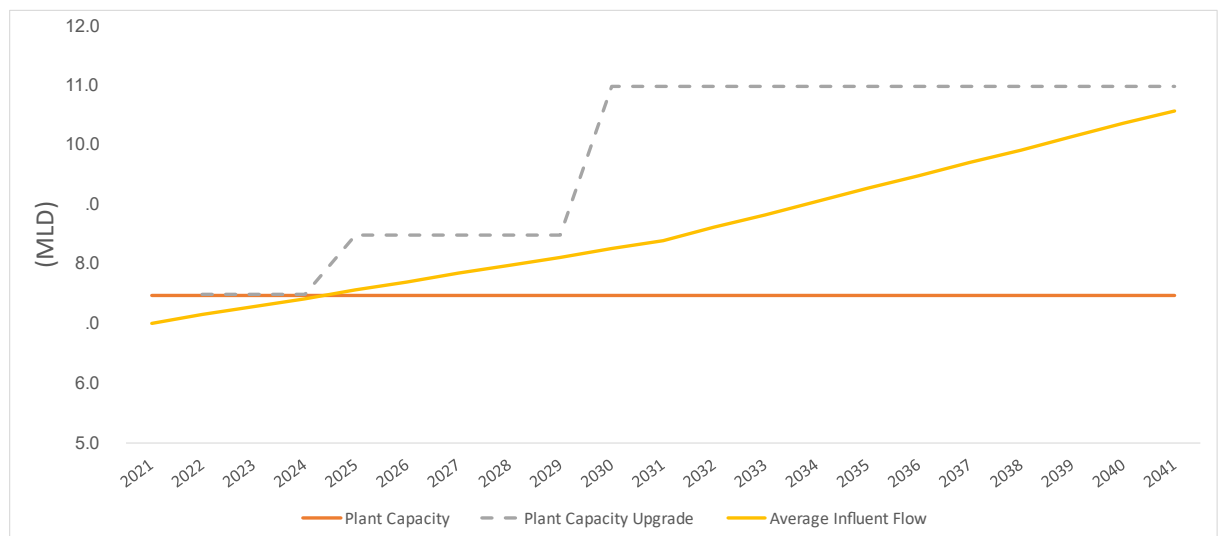


Figure 14: Estimated future average wastewater flows from 2021 - 2041 against current WWTP capacity

This graph shows that the average daily wastewater flow is expected to exceed the current estimated WWTP capacity (7.5 MLD) by 2024/25, and could reach 10.6 MLD in 2041. Figure 14 has assumed a two stage capacity upgrade of the treatment plant to account for uncertainty in the population growth forecast.

6.2 Treated Effluent Irrigation

In addition to treatment capacity to serve future growth, it is also necessary to consider how growth impacts the treated effluent irrigation system.

Taking into account the estimated future average wastewater flow, the irrigation area would have to be increased to 100 ha in the next 20 years to accommodate growth based on the current consented nitrogen loading rate (see Figure 15).

The required 100 ha irrigation area is estimated based on current plant performance - this can be reduced if the wastewater treatment process is improved to increase nitrogen removal. If the effluent average nitrogen concentration is reduced from 43 currently to 25 mg/L, the irrigation area would be reduced to 60 ha to be within the consented loading rate of 1400 kgN/ha/year. This would require only 20 ha of additional land, rather than 60 ha. Note the suitability of the hydraulic loading rate needs to be confirmed.

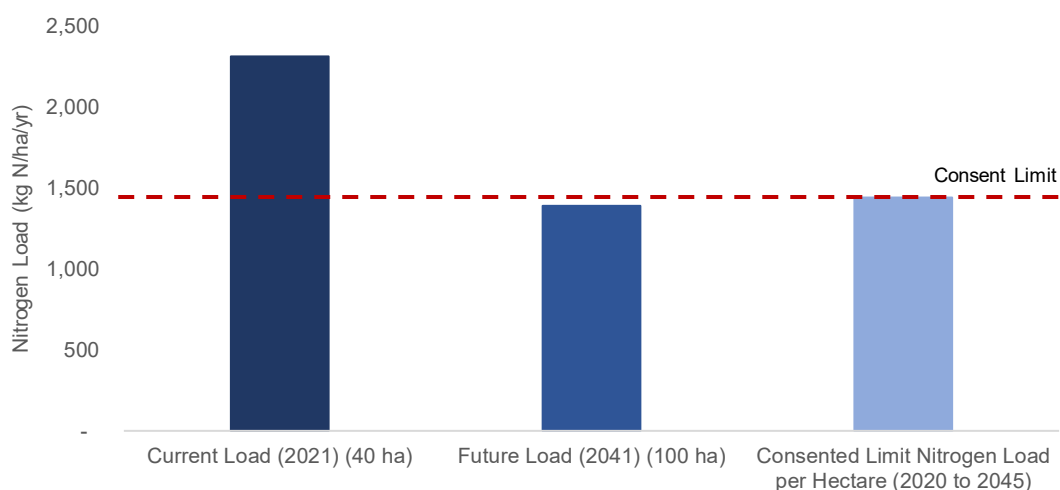


Figure 15: Current and future nitrogen loads to land vs consent limit

Figure 16 shows the estimated annual volume of treated effluent to be discharged to land from 2021 to 2041.

According to this figure, the consent limit for the annual volume of treated effluent discharged would have to increase from 2,237,559 m³/year to approximately 3,200,000 m³/year, or by 43%. Further investigation will be required to accurately quantify the percentage disposed of via infiltration.

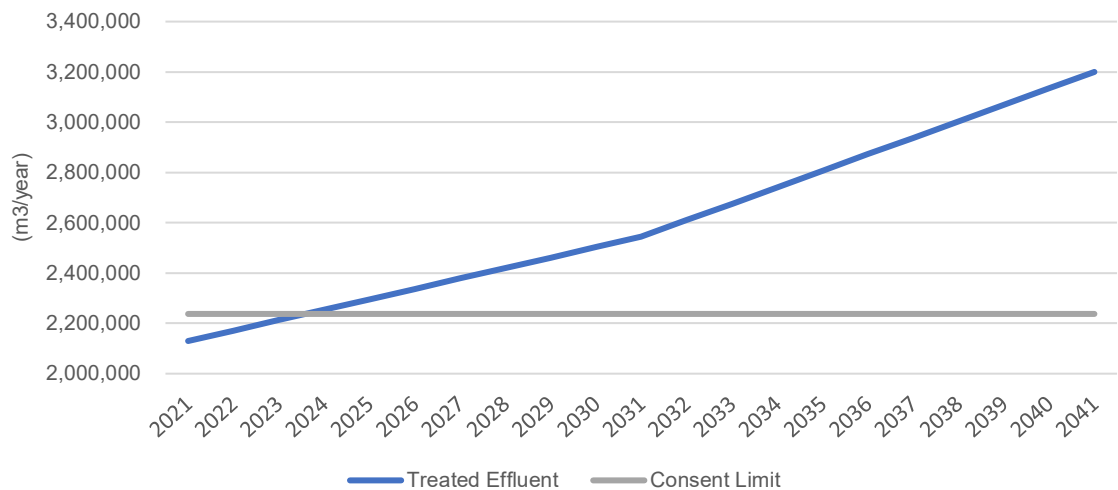


Figure 16: Estimated annual volume of treated effluent to be discharged in ‘the Pot’ from 2021 to 2041

It should be noted that any increase in the volume of treated effluent being irrigated in ‘the Pot’, annual nitrogen loads to land, or irrigation area will likely require applying for a new discharge consent or a variation to the current consent. We would recommend planning assessments are undertaken to confirm any planning and consenting requirements for this.

6.3 Recommendations to Enable Servicing of Future Growth

The following is recommended to enable the Levin wastewater system to service future growth:

- Further investigations are undertaken to establish the Levin WWTP capacity with greater certainty. A detailed plant capacity study could yield opportunities for short term capacity increase through minor plant additions. Nonetheless, the Levin WWTP is already operating close to its capacity of 7.5MLD and a capacity increase is needed around 2024. An upgrade of this magnitude would typically be in the order of 2 years or longer including consultant engagement, scoping, tendering, design, and construction. This should therefore be commenced shortly, and this project should be undertaken in parallel to the Levin wastewater master plan.
- Undertake further detailed assessment of various options to increase the WWTP capacity and the effluent quality. This should be included as part of the Levin wastewater master plan, already scheduled in HDC’s 2021-2051 Infrastructure Strategy.
- The annual volume limit to the irrigation field is estimated to be exceeded in 2024, on the assumption that 18% of treated effluent volume is disposed via infiltration. This volume needs to be confirmed. The current consent for “the Pot” expires in 2045, however additional consenting is likely required in the short term to assist with the needed increase of discharge volume.
- The consented nitrogen loading rate at “the Pot” will need to be kept within the consented loading rate of 1400 kgN/year per ha from December 2021 onwards. We understand this is being addressed by a separate investigation.
- Monitor and review the capacity of the irrigation field and compliance with annual nitrogen loading rates. If confirmed that further land is required, assess and confirm area requirements to match projected discharge quality and volumes. We understand the long term infrastructure requirement for treated effluent disposal will be addressed in the Levin wastewater master plan.

- There is a direct interplay between irrigation system disposal capacity and treatment quality – it may be possible to reduce disposal requirements by adopting a higher quality treatment process. We recommend that this be examined as part of the wastewater master plan.

It should be noted that upgrade of the Levin WWTP and the effluent land-based discharge system would be required with or without the Tara-Ika development.

It is important to note that many of these recommended actions can use budget which has already been allocated in the HDC's draft LTP 2021-2041. Refer to Table 4.

6.4 Notional Timeframes

6.4.1 WWTP Capacity

It is recommended that HDC initiate the work for a small capacity upgrade at the WWTP in **2022** at the latest so that construction can be **completed around 2024**. HDC already has budget allocated to upgrade and expand the WWTP in the draft LTP 2021-2041 (see Section 4) – some of the budget may have to be brought forward.

It is understood that the Levin wastewater master plan will identify a staged work programme to address short and long term treatment and treated effluent disposal issues.

6.4.2 Disposal Capacity

As shown in Figure 16, the annual volume of treated effluent to be discharged could reach the current consent limit around 2024. A consent planning assessment is recommended in the **next 12 months** to identify the consenting strategy on increasing the volume limit of treated effluent to "the Pot".

Similar to the above, the long term treated effluent disposal strategy will be addressed in the upcoming wastewater master plan.

7. Conclusion

From our high level capacity assessment, it can be concluded:

1. It is feasible to service the proposed Tara-Ika growth area from the current WTP system in the short term, until around 2030. Feasible upgrades are available to enable the water plant to service growth in the long term, and the plant upgrading process should start at least 2 years in advance (approximately **by July 2028 at the latest**).
2. The water source take consent and capacity are sufficient to service growth in Levin in the short term, until around 2031. Applying for higher abstraction limits would be required in the long term to enable the water system to service the Tara-Ika development and any additional growth. Application for an increased water abstraction limit should be completed and **approved before the end of 2030**.
3. The consent to discharge return water back to the Ohau River is sufficient to service the estimated growth in Levin in the short term, until around 2033. Applying for a higher discharge limit would be required in the long term (**approved by the end of 2032**).
4. HDC's 2021-51 Infrastructure Strategy has earmarked a long term study to identify supplementary water source and supply, with part of the budget needing to be brought forward. This will be part of the Water Master Planning for Levin and surrounding settlements, such as Ohau.
5. The existing WWTP and treated effluent irrigation system do not have sufficient capacity to service the full extent of the proposed Tara-Ika growth area and additional infill growth within Levin's urban area. It is feasible to undertake capacity upgrade of the Levin WWTP and the effluent irrigation system, however, investigations are recommended to establish the plant capacity with more certainty, and identify potential options to facilitate short term capacity increase.
6. HDC has planned a wastewater master plan during 2021/22 to 2024/25 to identify a staged work programme to develop services in Levin in short and long term. It is envisaged this master plan will cover wastewater collection, treatment and treated effluent discharge infrastructure. In addition to this, it is recommended that the master plan specifically include assessment of options to improve the effluent quality, land identification for additional irrigation areas, and consenting for increasing the volume limit of treated effluent to "the Pot".
7. In parallel to the wastewater master plan which will develop a short and long term programme, as noted in 5 above, there is a need to **commence immediate improvements** at the Levin WWTP and the treated effluent irrigation system to enable servicing of the Tara-Ika growth area in the short term.

GHD


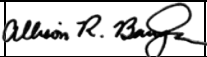
52 The Square
Palmerston North
T: 64 6 353 1800 F: 64 6 353 1801 E: Level 2

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https://projectsportal.ghd.com/sites/sp01_01/residentialgrowthare/ProjectDocs/12536997-REP_Tara-Ika
Residential Growth Area Enabling Works Water and Wastewater Capacity Assessment.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft A	Gabriela Balzat	Andre Blow Ian Ho David Arseneau		A. Reiko Baugham		19/03/2021
Final	Gabriela Balzat	Ian Ho David Arseneau		A. Reiko Baugham		28/04/2021
	Gabriela Balzat	David Arseneau Andre Blow		A. Reiko Baugham		16/07/2021

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Appendix 8: Statement of Evidence - Water and Waste Water

IN THE MATTER of the Resource Management Act
1991 (**RMA**)

AND

IN THE MATTER of a hearing by the Horowhenua
District Council on Proposed Plan
Change 4: Taraika Growth Area to
the Horowhenua District Plan.

**EVIDENCE OF PETER FREE
ON BEHALF OF HOROWHENUA DISTRICT COUNCIL
Water Treatment Specialist
21 September 2021**

1. QUALIFICATIONS AND EXPERIENCE

1. My full name is Peter Free. I have a NZ Certificate in Civil Engineering from the Central Institute of Technology; a NZ Certificate in Science in Water Technology from the Central Institute of Technology, and a Post Graduate Diploma in Business Studies in Management from Massey University. I have over 37 years' of experience in Water and Wastewater Projects, including 10 years at GHD.
2. I have been involved in a number of Drinking Water Treatment Plant (WTP) and Wastewater Treatment Plant (WWTP) projects in New Zealand and internationally.
3. I have been engaged by Horowhenua District Council (HDC) since September 2020. For this project, I was involved in supporting the Tara-Ika Residential Growth Area: Enabling Infrastructure Water and Wastewater Plants Capacity Assessment work for GHD.
4. I advise that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise and I have not omitted material facts known to me that might alter or detract from my evidence.

2. SCOPE OF EVIDENCE

5. I have been asked to provide evidence in relation to the Levin Water and Wastewater Treatment Plants capacity to support this development. I supported the preparation of the Tara-Ika Residential Growth Area: Enabling Infrastructure Water and Wastewater Plants Capacity

Assessment, July 2021 (the Water and Wastewater Capacity Assessment, see Appendix A), in which an assessment was undertaken to evaluate if the current capacities of Levin WTP and WWTP are sufficient to service the new development and additional infill growth in Levin; and to identify feasible pathways forward to upgrade these plants when additional treatment capacity is required. These elements are discussed further in my evidence below. I have read the submissions received on the Application and the Report prepared in accordance with s 42A of the RMA (the Council Report).

6. My evidence will cover the following matters:

- a) Current and Future WTP and WWTP capacity;
- b) Expected future servicing requirements with Levin and Tara-Ika;
- c) Comments on submissions; and
- d) Conclusions.

3. SUMMARY OF EVIDENCE

7. GHD have been engaged by HDC to evaluate if the current capacities of Levin WTP and WWTP are sufficient to service the new development and additional infill growth in Levin; and to identify feasible pathways forward to upgrade these plants when additional treatment capacity is required. I supported the GHD team in completing this work. This work follows on from other work by GHD supporting this plan change application.

8. In my opinion, it is feasible to service the proposed Tara-Ika growth area from a WTP and WWTP perspective, though in both instances upgrades are likely to be required in order to support this development.

4. RELEVANT FACTS AND CONTEXT

9. In this statement of evidence, I do not repeat the Project description and refer to the summary of the Application in the evidence of Lauren Baddock on behalf of Horowhenua District Council.

5. PURPOSE OF THE WTP AND WWTP PLANTS CAPACITY ASSESSMENT

10. The purpose of GHD's work is described in Section 1 of Water and Wastewater Capacity Assessment. This Water and Wastewater Capacity Assessment also documents the process undertaken in establishing the plant capacities and predicted future demand.

6. EXISTING WTP AND WWTP CAPACITIES

11. The Water and Wastewater Capacity Assessment outlines the relative current capacities of the Levin WTP and WWTP. In both instances in my opinion it is clear there is currently available capacity at these plants (with some limitations in terms of the WWTP) to assist with the implementation of the initial stages of the Tara-Ika development, however this capacity is likely to be exhausted by the size and scope of the new development, and therefore additional upgrades will be required to support the full extent of proposed development.

7. EXPECTED FUTURE SERVICING

12. The Water and Wastewater Capacity Assessment outlines the growth rates both within the existing Levin area and the proposed Tara-Ika development. Predictions have been made when the required upgrades may need to be implemented. In my opinion more work is required to better establish expected growth rates, staging and predicted build out, however this exercise provides a useful order-of-magnitude guide for upgrade requirements.
13. In my opinion, the expected timeframes for upgrades are reasonable in the context of infrastructure upgrades of this scale, with time available to plan, design and then implement any required upgrades. I note the most immediate needs are around the WWTP and WW disposal system, but timing will depend on realised growth rates and would be assisted by a more detailed review of the WWTP and the WW irrigation system.
14. I acknowledge HDC's current and future infrastructure plans (as presented in the Three Waters Infrastructure Plan and the LTP) that are intended to promote additional Water and Wastewater capacities in Levin.

8. COMMENTS ON SUBMISSIONS

15. In reviewing submissions, my team and I have identified key recurring themes relating to the work completed by GHD for this Project. To aid in the brevity of this evidence, I respond to the key themes identified below.

Infrastructure Planning

16. Some submitters have identified issues relating to infrastructure planning, and whether this is sufficient to cater for the proposed demand.
17. I refer to earlier parts of this evidence to outline why it is my opinion that there is current capacity to support some growth, however additional infrastructure will be required with a stage approach, to support the ultimate development's growth in addition to growth within the existing Levin limits.

18. It is typical when servicing a greenfields site that servicing will be staged to optimise capital spend and to avoid providing over capacity as that can often bring operational difficulties.
19. I refer to the evidence of Lauren Baddock that outlines the future planning that will be undertaken to support this growth.

Future Environmental Impact

20. Some submitters have identified issues relating to potential future environmental impacts associated with this additional development.
21. Refer to earlier parts of this evidence to outline why it is my opinion that additional upgrades are required to existing infrastructure to support this development – this includes in some instances improvements to infrastructure to improve quality rather than simply capacity alone – for example upgrades to improve the effluent discharge quality from the WWTP.
22. My team has also identified areas that require modification to existing Resource Consents currently held at the WTP or WWTP. Naturally changes to consents would need to be consistent with the One Plan and that alternatives would need to be assessed to determine the appropriateness of the proposed solution, and measures implemented to manage the environmental impacts.

Density of Development

23. Multiple submissions have indicated a strong desire to increase the density of proposed residential development in the Plan Change, removing much of the low-density residential areas in favour of standard or medium density areas. This increases the projected additional houses to 3,500 at a minimum. This range was accommodated in the technical analysis include in the Water and Wastewater Capacity Assessment (Appendix A), and if exceeded serves only to accelerate the timeline for implementing the report recommendations. The overall conclusions and recommendations of the report and this evidence are unchanged.

Cost

24. Multiple submissions have identified cost implications to support the infrastructure required for this plan change. However, we understand this is outside the matters that are relevant for consideration of this Plan Change and the Council's LTP process details the budget issues for infrastructure costs.

9. CONCLUSION

25. My team and I were commissioned by HDC to evaluate if the current capacities of the Levin WTP and WWTP are sufficient to service the new development and additional infill growth in Levin, and to identify feasible pathways forward to upgrade these plants if additional treatment capacity is required. In my opinion, there is currently sufficient capacity to support some of the proposed growth, and feasible upgrades exist at both the WTP and WWTP in order to cater for the proposed future demand from the Tara-Ika Development.

Peter Free

16 July 2021

A handwritten signature in black ink, appearing to read 'P J Free', written over the printed name and date.

Appendix 9: Stormwater Technical Memorandum

Technical Memorandum

09 August 2021

To	Daniel Haigh, HDC	Tel	027 200 5450
Copy to		Email	david.arseneau@ghd.com
From	David Arseneau	Ref. No.	12536997
Subject	Tara-Ika Growth Area: Summary of Stormwater Management Analysis and Strategy		

1. Introduction

Horowhenua District Council (HDC) is currently undertaking the Plan Change process for the Tara-Ika Growth Area in Levin. GHD has provided ongoing 3 waters technical support to Council for the Tara-Ika area in support of the Plan Change and enabling infrastructure implementation, and through this work has identified future risks associated with discharge of stormwater runoff from the development area, particularly with the available overland flow routes to the receiving environment (i.e., Koputaroa Stream or Lake Horowhenua) and with the need to identify stormwater management servicing requirements for the Plan Change area. GHD has also provided 3 waters technical support in HDC's ongoing liaison with Waka Kotahi around the Ōtaki to North of Levin (Ō2NL) Expressway which is planned to run through the western portion of the Growth Area.

1.1 Purpose of this Memo

This memo summarises the stormwater analysis that has been completed to date by GHD and others, and presents recommended stormwater management strategies and design criteria for consideration in the Plan Change that have evolved from the existing body of work.

1.2 Limitations

This report: has been prepared by GHD for Horowhenua District Council and may only be used and relied on by Horowhenua District Council for the purpose agreed between GHD and Horowhenua District Council as set out in section 1 of this report.

GHD otherwise disclaims responsibility to any person other than Horowhenua District Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

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2. The Evolution of Stormwater Management in Tara-Ika

2.1 Subdivision and Development Principles and Requirements

The primary source at present for stormwater design guidance for the Tara-Ika growth area are the Council's *Subdivision and Development Principles and Requirements* (SDPR), which in turn is based largely on NZS 4404:2010, Stormwater. The SDPR provides relatively comprehensive but high-level guidance on the design of stormwater servicing for subdivision sites, including several key criteria for sites that intend to use soakage features. A selection of key criteria from the SDRP that will be important for Tara-Ika include (summarised):

- Design storm Annual Recurrence Intervals (ARIs) for reticulation (10 year) and overland flow (100 year), including accounting for climate change by applying a 16% increase to rainfall, and using a critical storm duration analysis.
- Requirement for hydraulic neutrality for all design storms between the 2 year and 100-year events.
- Overland flow paths must be in public land where possible.
- Requirement for overland flow paths and discharge even if soak pits are intended to dispose of all runoff.
- Residences must have freeboard above the 200-year flood level.
- Design must consider groundwater levels and mounding, as well as quality.
- Water quality ponds/wetlands will be constructed where practical, and include pre-treatment to remove floatables and other debris.

2.2 Taraika Master Plan (Local/McIndoe Urban, Draft 2020)

The *Taraika Master Plan* included high-level guidance and direction for stormwater management in the Tara-Ika growth area (Figure 1), to provide an overarching philosophy upon which to base more detailed technical analysis and design.



Figure 1 Overview of Stormwater Management Approach from Taraika Master Plan

Relevant guidance from the Master Plan (summarised from the version lodged with the Plan Change) with respect to stormwater management is summarised below:

- Design must implement principles of water sensitive design with an integrated approach to protect downstream environments and enhance amenity.
- All infiltrated flows will receive water quality treatment prior to discharge or be solely from low contaminant surfaces such as roofs.
- Open space is to be located in coordination with stormwater management.
- Development must explore the use of rainwater collection tanks to contribute to both stormwater management and water demand reduction.
- Development must retain and treat stormwater on site where possible.
- Landscape buffers alongside the expressway shall be used to manage and treat stormwater.

2.3 Draft Plan Change Provisions (2020)

Relevant objectives and policies from the proposed Tara-Ika Plan Change submission, based on the draft provisions available at the time of this memo, include the following:

- Objective 6A.3: Stormwater management in Tara-Ika will be resilient and environmentally sustainable, including:
 - Resilient to natural hazards and the likely effects of climate change;
 - Water sensitive design;

- Minimise adverse effects from changes in the nature (including quality and quantity) of natural flows on downstream ecosystems.
- Policies 6A.3.1 to 6A.3.3:
 - Require an integrated approach to managing stormwater from Tara-Ika to ensure the quality and quantity of runoff does not have an adverse effect on Lake Horowhenua.
 - Recognise the significance to iwi of the Tara-Ika environment and its connection to Lake Horowhenua by working with iwi to manage stormwater quality and quantity.
 - Require rainwater collection tanks to be provided on all new residential allotments to capture and reuse runoff to mimic, as much as practicable, pre-developed hydrological conditions for the site.

Relevant Rules from the proposed Tara-Ika Plan Change:

- 15A.6.2.1 Rainwater Tanks: all dwellings will have a stormwater collection tank of various size depending on roof area, connected to internal and external non-potable reuse.
- 15A.8.1.2 Subdivision (and similar for other landuses): provision of servicing, including stormwater management and disposal, is a matter of discretion for Council.
- 15A.8.1.3 Non-compliance with requirements for Rainwater Tank (and similar for other land uses): matters of discretion include the potential for increased volume of stormwater discharge from the site, and proposed methods of managing quality and quantity of stormwater discharge from the site.

2.4 Stormwater Management Plan (GHD, 2020)

GHD was commissioned by HDC to develop a Stormwater Management Plan for Tara-Ika, building off of the high-level stormwater objectives and philosophy described in the Tara-Ika Master Plan (see Section 2.2). The purpose of the Stormwater Management Plan was to support the Plan Change process through demonstrating the practical feasibility of the proposed management approach in mitigating effects of the development on the downstream receiving environment.

The core servicing strategy of the Stormwater Management Plan included the following components:

- Capture of runoff from roofs for reuse in dedicated greywater systems.
- Soakage of runoff from roofs (in excess to that needed for reuse) up to the 10-year ARI storm in on-lot soakage devices.
- Conveyance and treatment of runoff from all non-roof impervious surfaces in stormwater treatment wetlands, to be located primarily along the Ō2NL corridor.
- Attenuation of runoff up to the 100-year ARI flow in detention ponds co-located with the treatment wetlands.
- Discharge of attenuated runoff along the Ō2NL corridor or along existing overland flow routes.

Outputs from the Stormwater Management Plan included items such as the identification of overland flow path outlets (Figure 2, top), preliminary sizing of trunk stormwater reticulation based on the Master Plan development layout (Figure 2, bottom), and preliminary sizing of treatment wetlands and attenuation basins. The level of service criteria employed in the Stormwater Management Plan included attenuation of all post-development peak flows up to the 100-year ARI peak flow (including the effects of climate change) to pre-development levels, thereby providing flood risk protection to downstream areas; stormwater volumes were not specifically controlled under this plan. The initial preferred outlet for stormwater runoff was the proposed Ō2NL corridor, which ultimately discharges to the Koputaroa Stream. In the absence of Ō2NL, the runoff would follow existing flow paths along SH57 and Queen Street; however, no detailed assessment was undertaken on the viability or environmental effects of these overland flow paths.

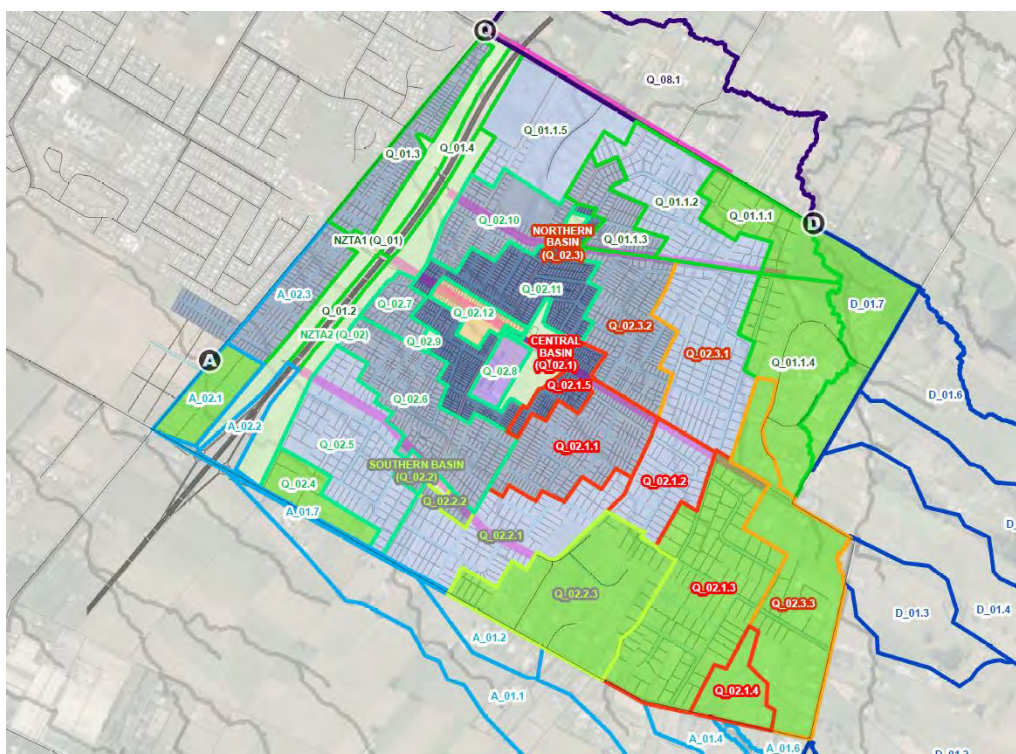


Figure 2 *Excerpt figures from Stormwater Management Plan showing post-development drainage catchments (top) and overall trunk reticulation servicing layout (bottom)*

2.5 3 Waters Master Plan (HDC, 2020)

Following completion of the Stormwater Management Plan (see Section 2.4), HDC finalised the overall 3 Waters Master Plan to service the Tara-Ika development, including servicing strategies for drinking water, wastewater and stormwater. This plan was included with the package of documents lodged by HDC with the Tara-Ika Plan Change. With particular regard for stormwater management, the 3 Waters Master Plan states the following:

Development of Taraika will result in increased stormwater volume and peak flows and result in water quality impacts to downstream areas. Since Taraika is at the top of the drainage catchment, an increase in runoff could have significant impact on the receiving stormwater systems, whether they are the piped networks, open drains, Lake Horowhenua, or the Koputaroa Stream. Water

sensitive urban design (WSUD) will be required within the development area to mitigate the effect of development. Examples of WSUD devices which can be incorporated within the development to mitigate the stormwater quantity and quality impacts include rainwater tanks, soakage, permeable pavements and biofiltration. In addition to these, attenuation is to be provided throughout the development area to reduce the peak flow leaving the development area.

The 3 Waters Master Plan further reinforced the direction adopted in the Taraika Master Plan and Stormwater Management Plan, and provides the foundation for the recommended stormwater design criteria included in this memo (refer Section 3.3).

2.6 Consideration of Overland Flow Routes

After completion of the Stormwater Management Plan and 3 Waters Master Plan, HDC initiated a more robust risk identification and mitigation exercise on the proposed servicing strategies for Tara-Ika. Of particular concern for the stormwater servicing strategy was the feasibility of the overland flow routes for discharge of runoff from the development area. The two primary outlet options identified in the Stormwater Management Plan, based on existing flow patterns and topography, are listed below and shown in Figure 3:

- Northwest to Lake Horowhenua via Queen Street.
- Northeast to Koputaroa Stream via SH57 and existing watercourses.

However, upon closer review both discharge options have significant implications for consenting and environmental effects:

- Discharge of stormwater surface runoff to Lake Horowhenua is a non-complying activity under Rule 13-9 of the Horizons Regional Council *One Plan*, presenting a challenging consenting pathway. The Lake is currently affected by long-term water quality issues and significant efforts are underway to protect and restore the lake.
- Discharge of stormwater runoff to the Koputaroa Stream, which is currently being pursued by HDC for the Northeast Levin development area, presents several challenges due to existing wide scale flooding issues in the capacity-limited system. Horizons Regional Council has indicated high resistance to receiving more runoff, particularly from outside of the existing catchment area (as Tara-Ika is located within the Lake Horowhenua catchment).

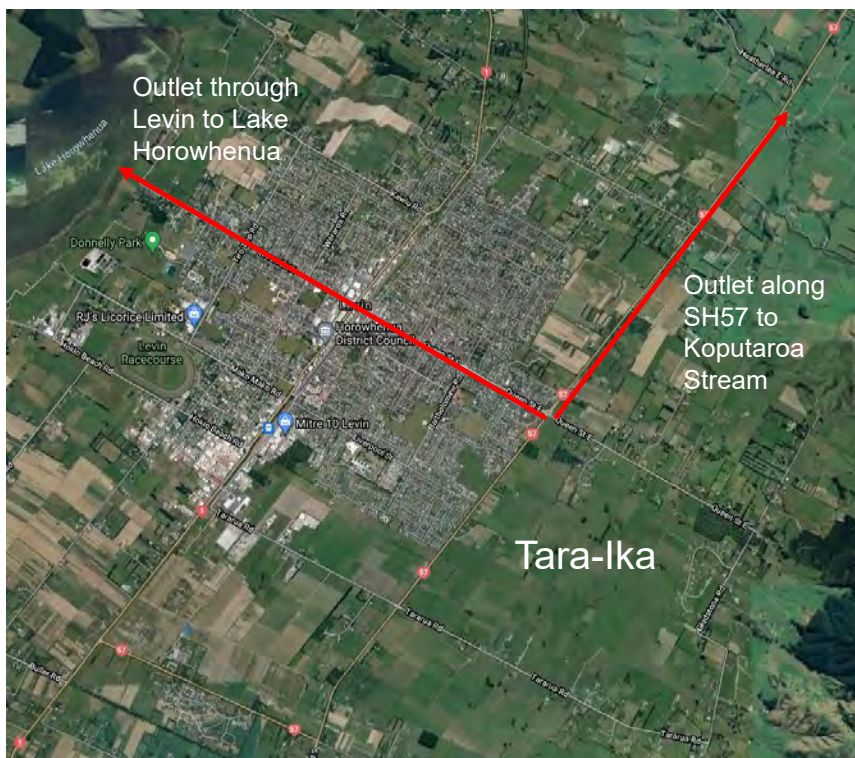


Figure 3 Stormwater Overland Flow Outlets from Tara-Ika

Another risk that was identified as relevant to the stormwater management strategy was the potential for the Ō2NL expressway to be cancelled or otherwise not constructed, which has significant implications for the feasibility of discharging stormwater runoff to the Koputaroa Stream. Section 2.7 below describes this risk along with the analysis undertaken by GHD and HDC to develop mitigation solutions.

2.7 Consideration of the Ō2NL Expressway (GHD, 2020)

The location of the Tara-Ika Growth Area overlaps with that of the proposed Ō2NL corridor, with the current highway alignment traversing the site parallel to and offset from the existing SH57. As currently configured the highway would separate a strip of Tara-Ika from the majority of the residential area, would bisect the current overland flow routes for stormwater drainage, and would also partially overlap the logical locations for stormwater attenuation and treatment devices for the development. In addition, the current design proposal for Ō2NL involves a significant vertical cut along the highway alignment, which would further disrupt the overland flow paths and stormwater servicing options for Tara-Ika.

In consideration of the future eventuality of Ō2NL, Council requested in December 2020 that GHD provide high-level alternatives for stormwater servicing both with and without the presence of the highway. The assessments completed at that time are summarised in the sections below.

2.7.1 Stormwater Servicing with Ō2NL

The stormwater servicing study that has been undertaken to date has assumed that the Ō2NL corridor would be constructed, and some preliminary work has been completed around the staging of stormwater servicing to facilitate development. However, uncertainty as to the likely construction timeline of the Ō2NL corridor results in a corresponding uncertainty in the stormwater servicing staging and configuration for Tara-Ika.

The Tara-Ika team have developed a servicing and staging approach assuming that the Ō2NL is constructed with the deep vertical cut, which includes the elements listed below. Note this takes into consideration staged construction of Ō2NL as well.

- Install distributed soakage disposal for roof runoff throughout the development.
- Discharge runoff from the eastern ~75ha of development to the Koputaroa Stream (see “Koputaroa Catchment” on Figure 6 on page 10) following wetland treatment, attenuation and soakage in a facility adjacent to Queen Street and the existing treed reserve area.
- Construct wetland treatment facilities along the eastern boundary of the Ō2NL corridor cut slope, with an appropriate setback (15-30m) from the top of slope.
- Construct soakage disposal facilities downstream of the wetland treatment areas that overlap with the Ō2NL corridor (partially or fully), sized appropriately for the evolving extent of upstream development, to service the development prior to the construction of the highway.
- During construction of the highway, which is expected to require several years through the Tara-Ika area, Waka Kotahi and Council will work collaboratively to stage construction in a manner that facilitates stormwater disposal prior to decommissioning of the temporary at-grade soakage devices. This is yet to be confirmed with Waka Kotahi.
- Following completion of the highway construction, treated stormwater from the wetlands will be discharged down the cut slope to the highway corridor, and will then be soaked, treated, attenuated and/or conveyed off-site along the highway corridor to the Koputaroa Stream.

2.7.2 Stormwater Servicing without Ō2NL

Servicing Tara-Ika if the Ō2NL corridor is not constructed would involve several modifications to the approach described above, to best take advantage of the site features and topography. These modifications include:

- Install distributed soakage disposal for roof runoff throughout the development (as in the above scenario).

- Diversion of runoff from the eastern ~75ha development area (see “Koputaroa Catchment” on Figure 6 on page 10) may not be necessary or desired in this case, as greater soakage disposal could be realised within the Tara-Ika site, reducing potential strain on the Koputaroa Stream system.
- Locate the primary wetlands and soakage disposal facilities closer to SH57, within or west of the proposed Ō2NL alignment.
- Discharge major overland flows (i.e., greater than the 100-year ARI flow) along current flow paths and/or along SH57 to the Koputaroa Stream to the north.

2.8 Geotechnical Investigations for Soakage (GHD, ongoing)

The risk-based assessment of stormwater servicing options considering the available overland flow routes from Tara-Ika (described in Section 2.6) and the Ō2NL expressway corridor (described in Section 2.7) highlighted the importance of soakage to manage stormwater runoff from the development area and a need to understand both the feasibility and implications of this strategy. In response, HDC immediately initiated a geotechnical and hydrogeological investigation to assess potential soakage rates across the development area, as well as to install monitoring wells to observe groundwater levels and better understand the potential effects that large-scale stormwater soakage may have on areas located down-gradient of Tara-Ika.

GHD was commissioned to undertake this investigation work, which includes seven boreholes and monitoring wells fitted with water level loggers, and completion of Double Ring Infiltrometer (DRI) tests at five locations in Tara-Ika to assess soakage rates (sample DRI test shown in Figure 4, soakage test locations shown in Figure 5). This work was completed between December 2020 and January 2021, with groundwater monitoring wells still in place.

The initial round of soakage testing identified “raw” soakage rates of between 60 and 240 mm/hr; safety factors of between 1/5 and 10 (based on industry guidance from CIRIA – *The Sustainable Drainage Systems (SuDS) Manual*) are then applied to account for uncertainty in soil conditions across the footprint of a soakage device, long-term degradation of soakage capacity, and the overall risk associated with failure of the soakage facility (i.e., flooding of downstream areas). Suitable safety factors for Tara-Ika are expected to be between 3 and 5, based on the risks related to overflows/failures of the soakage systems.

Further testing was undertaken in May 2021 near the anticipated initial development area off Queen Street East, as part of ongoing collaborative efforts with landowners to facilitate development. These localised tests identified raw soakage rates of 360 to 1440 mm/hr, and was found to be highly dependent on the specific soil layer that was assessed.

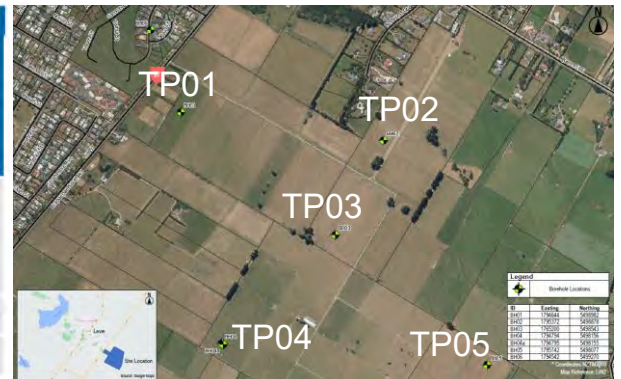
Based on the collected results of both rounds of testing, soakage throughout the Growth Area is highly variable. A preliminary allowable soakage value of 100 mm/hr was deemed to be suitable for development planning and preliminary design; however, this needs to be confirmed through specific, localised soakage testing as part of detailed design for engineering plan review. Utilising this lower number is considered to be appropriate for preliminary planning and design stages as the required soakage areas will likely decrease once testing has been undertaken.

The soakage testing report completed by GHD is included as Attachment 1.



Figure 4 Double Ring Infiltrometer setup used for soakage testing

Test ID	Raw infiltration rate (mm/hr)	Long Term Infiltration Rate mm/hr (L/min/m²)				Inferred GW Depth (m bgl)
		FoS=1.5 No damage or inconvenience is anticipated due to overland flow	FoS = 3 Design includes overland flow paths, drained area < 1000 m²	FoS = 5 Design includes overland flow paths, drained area > 1000 m²	FoS = 10 No overland flow paths	
TP01	240	160	80	48	24	deep (>9 m)
TP02	60	40	20	12	6	deep (>9 m)
TP03	120	80	40	24	12	deep (>9 m)
TP04	120	80	40	24	12	moderate >4 m
TP05	60	40	20	12	6	deep (9 m)



Test ID	Raw infiltration rate (mm/hr)	Long Term Infiltration Rate mm/hr (L/min/m²)			
		FoS=1.5 No damage or inconvenience is anticipated due to overland flow	FoS = 3 Design includes overland flow paths, drained area < 1000 m²	FoS = 5 Design includes overland flow paths, drained area > 1000 m²	FoS = 10 No overland flow paths
TP01-1	360	240	120	72	36
TP01-2	360	240	120	72	36
TP01-3	385	257	128	77	38.5
TP02-1	1320	880	440	264	132
TP02-2	1440	960	480	288	144
TP02-3	1440	960	480	288	144
TP02-4	1200	800	400	240	120
TP02-5	1440	960	480	288	144



Figure 5 Summary of soakage testing locations and results for first round (top) and second round (bottom)

2.9 Zero-Discharge Approach

The culmination of the stormwater planning, analyses and investigations described in Sections 2.1 to 2.8 led HDC to adopt the current preferred strategy, referred to as the “Zero-Discharge Approach”. Under this approach, all stormwater runoff up to the 100-year ARI event including the effects of climate change are retained within the development area and ultimately soaked into the ground. The key components of this approach are similar to those described in the Stormwater Management Plan, and include the following:

- Capture of runoff from roofs for reuse in dedicated greywater systems.
- Soakage of runoff from roofs (in excess to that needed for reuse) up to the 10-year ARI storm in on-lot soakage devices.

- Conveyance and treatment of runoff from all non-roof impervious surfaces in stormwater treatment wetlands, to be located primarily along the Ō2NL corridor – these locations are consistent regardless if the Ō2NL proceeds or not.
- Retention and soakage of runoff up to the 100-year ARI flow (including climate change effects) in soakage basins. Ideally these basins are co-located with the treatment wetlands; however, the expected footprint requirements of the basins will require flexibility in siting.
- Discharge of runoff in excess of the 100-year ARI event along the Ō2NL corridor or along existing overland flow routes.

This approach provides HDC and landowners with greater certainty and confidence in the feasibility of stormwater servicing in Tara-Ika in terms of resource consenting, and a clear way forward to enable development to proceed.

As part of the initial development of the Zero-Discharge Approach, GHD undertook a high-level stormwater runoff analysis to determine conceptual wetland and soakage basin footprints using relatively conservative assumptions around development density and soakage capacity. This analysis was completed in March 2021. The resulting conceptual footprints are illustrated in Figure 6, showing an interim version of proposed zoning that differs slightly from the most recent Structure Plan. It should be noted that this assessment is considered to be conservative and does not reflect the likely actual footprints that will be implemented. The purpose of this figure is to provide an indicative layout of the proposed stormwater mitigation for planning purposes to identify overall feasibility. For this reason, it is not recommended that stormwater facilities be spatially identified on the Structure Plan or Planning Maps.

Further details of proposed design criteria under this approach are described in Section 3.3.

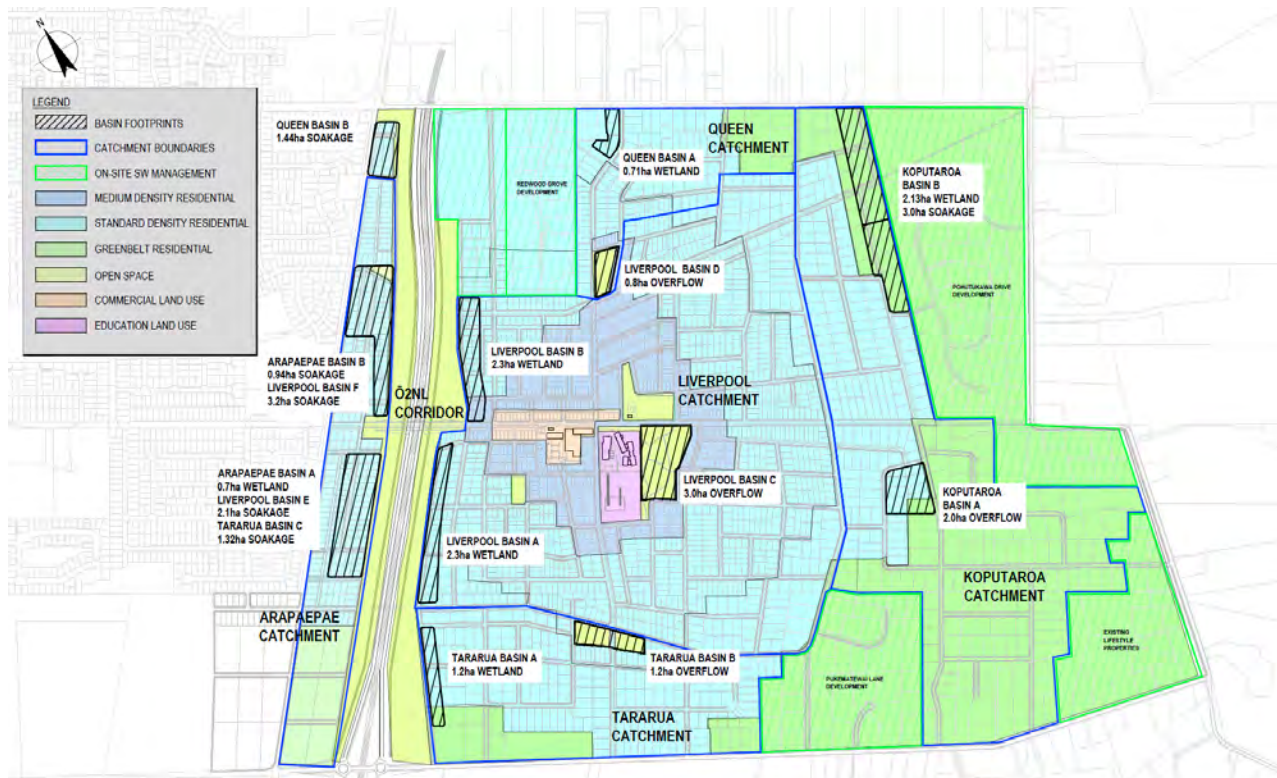


Figure 6 Indicative Stormwater Wetland and Soakage Basin Footprints for “Zero-Discharge” (March, 2021)

3. Stormwater Design Approach and Criteria

3.1 Gaps in Existing Standards and Knowledge

The existing SDRP and proposed Plan Change policies, objectives and rules provide comprehensive high-level direction for the design of stormwater infrastructure in Tara-Ika; however, to respond to submissions regarding the importance of good stormwater management and to facilitate the speed and ease of subdivision consent applications and engineering plan reviews more specific design criteria is desired. To inform these specific criteria the gaps in the existing guidance need to be identified, exposing areas where ambiguity exists which may result in low quality design outcomes. Areas where existing standards may lead to ambiguity in Tara-Ika designs include:

- **Design storms.** The SDRP does not specify a design storm duration or hyetograph shape but requires that the designer evaluate the critical storm duration for their application. However, traditional “time of concentration” (i.e., the time it takes for runoff from the entire catchment to reach the outlet) approaches to identifying the critical storm duration are likely inadequate for Tara-Ika, which includes several water sensitive design elements and may be more sensitive to longer-duration design storms that produce higher runoff volumes. As well, designs may be sensitive to different hyetograph shapes that can result in more/less intense rainfall periods or more/less runoff volume. Specific criteria should be established to ensure a more robust critical storm duration analysis is carried out, and to ensure that an appropriate hyetograph shape is applied.
- **Climate change.** The SDRP guidance on climate change involves a flat percentage increase to rainfall which is in line with previous versions of NIWA’s High Intensity Rainfall Design System (HIRDS) data; an updated approach would specify a specific climate change scenario, such as RCP 8.5 (recommended). The RCP 8.5 scenario is recommended over the RCP 6.0 scenario as an analogue for a time horizon roughly equivalent to 2120-2139, or about 100 years from present day. A 100-year design life is considered appropriate for a development of this magnitude.
- **Rainwater tank sizing.** Although the SDRP recommends that rainwater tanks be considered, it does not provide guidance on the sizing of rain tanks nor does it make them mandatory (although the District Plan provision would fulfill this need). The Tara-Ika Plan Change provisions would require rain tanks to be installed and plumbed into internal/external plumbing. Minimum tank sizes based on each lot’s roof area are recommended to be specified for Tara-Ika for the purpose of rainwater reuse and incidental stormwater attenuation¹; preliminary guidance has been established in the *Tara-Ika Integrated Water Management Concept Report* (Morphum, Draft 2020):
 - Roof area of 75m² or less – 2,000 litre capacity
 - Roof area of 75m² to 200m² – 3,000 litre capacity
 - Roof area of more than 200m² – 5,000 litre capacity
- **Soakage sizing.** In conjunction with the requirement for rainwater tanks, the design criteria should include a requirement for a minimum soakage capacity on each lot to dispose of, at minimum, the 10-year ARI runoff volume from roofs, assuming that the attached rainwater tank is full. These soakage rates should be based on actual on-site testing using appropriate/approved methodologies.
- **Stormwater servicing scales.** Soakage from non-roof impervious areas will be required to have pre-treatment prior to soakage; however, Council should consider the practicality and cost-effectiveness of distributed treatment and soakage devices across the entire development area (which will eventually vest into Council’s ownership), versus centralised treatment and soakage in fewer dedicated facilities-- this is further discussed in Section 3.3.
- **WSD guidelines.** Water quality treatment design guidance in the SDRP refers to the NZWERF “On-Site Stormwater Management Guidelines” which were published in 2004; more modern guidance should be specified for use in Tara-Ika designs.

¹ It is important to note that tanks are not to be considered when designing primary attenuation devices as it would require the tanks to be empty in order to provide any attenuation. Given that the tanks will be privately owned and maintained, stormwater mitigation should not include any allowance for the rainwater tanks.

- **Water quality volumes.** The SDRP does not require a specific runoff volume or ARI event to be treated for quality prior to bypassing along overland flow routes; this should be specified.
- **Acceptable treatment devices.** The SDRP and proposed Plan Change provisions do not specify types of stormwater treatment or attenuation devices that will be acceptable to Council, although this is not typically specified to a high level of detail in comparable documents for other Councils. However, considering the scale of the Tara-Ika development and magnitude of stormwater infrastructure that will vest to Council in the future, a “toolbox” of acceptable stormwater solutions could be developed for use by the developers.

3.2 Alternatives for the Scale of Stormwater Servicing

Adopting the Zero-Discharge Approach throughout the Tara-Ika development area can be done at different scales. Of interest to this assessment is the difference between the landowner-scale and development-scale of implementation, as described below:

- Landowner-scale (decentralised): stormwater treatment and attenuation are designed and constructed to service the development within each individual landowner’s property.
- Development-scale (centralised): stormwater treatment and attenuation are designed and constructed to service the Tara-Ika development area as a whole, independent of current property boundaries and ownership.

The centralised and decentralised approaches are associated with different benefits and drawbacks when considering performance outcomes, long-term maintenance, financial equity to landowners, efficient use of development area, design burden on landowners, and the pace at which development in Tara-Ika can be enabled. A high-level comparison of benefits and drawbacks is provided in Table 1.

Table 1 Comparison of centralised and decentralised stormwater servicing approaches

Servicing Alternative	Benefits	Drawbacks
Landowner-scale (decentralised)	<ul style="list-style-type: none"> – Each landowner has the ability to proceed with development at their own pace, regardless of if downstream stormwater measures have been put in place. – No financial compensation measures are required for those landowners whose properties may be disproportionately occupied by stormwater facilities. 	<ul style="list-style-type: none"> – Less efficient use of space overall in Tara-Ika: a larger number of smaller facilities will occupy more footprint than fewer, larger facilities. – Less protection for Tara-Ika residents downstream of stormwater facilities in extreme high flow events (in excess of 100-year ARI) when facilities will overflow. – Less opportunity to leverage future Ō2NL corridor for stormwater discharge. – Increased operations and maintenance burden on HDC with a larger number of smaller facilities, with potential for some facilities to remain in private ownership leading to poor long-term outcomes. – Risk of inconsistent design (can be managed through HDC guidelines and engineering reviews).
Development-scale (centralised)	<ul style="list-style-type: none"> – More efficient long-term operations and maintenance for HDC with fewer but larger facilities, leading to better outcomes. – Ability to leverage CIP funding to design and construct facilities to service the entire development area, placing less up-front design and construction burden on landowners. – Enhanced ability to sustain the stormwater wetlands due to larger 	<ul style="list-style-type: none"> – Landowners need to collaborate with neighbours to integrate infrastructure designs (can be facilitated through HDC). – Financial compensation measures required to ensure fairness in servicing costs and development potential for landowners serviced by the facilities (can be facilitated through HDC). – Requires enabling infrastructure to be in place (by HDC) for some areas of

Servicing Alternative	Benefits	Drawbacks
	catchment area (i.e., more base flow to sustain vegetation/biota), leading to better environmental outcomes. – More efficient use of developable area.	development to proceed (mitigated through CIP enabling funds).

After evaluation of the different servicing approaches, it is recommended that HDC pursue a centralised/development-scale approach. The more efficient use of development area, better environmental outcomes, and lower operations and maintenance burden associated with the centralised servicing approach are considered to outweigh the benefits of the decentralised approach; drawbacks of the centralised approach can be readily mitigated through action by HDC.

3.3 Recommended Stormwater Design Criteria

Based on the review of existing standards, proposed Plan Change provisions, the servicing approach outlined in the Tara-Ika Master Plan, and recent soakage testing and stormwater analysis, key stormwater design criteria can be recommended for application in development design, including the following:

1. The 12-hour nested design storm specified by Wellington Water in “Reference Guide for Design Storm Hydrology” (2019) shall be applied to Tara-Ika stormwater design calculations.
2. Design storms shall be developed with HIRDS v4 rainfall data for the development site using the RCP 8.5 (2081-2100) climate change scenario.
3. Acceptable design standards for individual stormwater treatment and/or attenuation devices include Wellington Water’s “Water Sensitive Design for Stormwater: Treatment Device Design Guideline” (2019 - preferred), or Auckland Council’s “Stormwater Management Devices in the Auckland Region” (2017 - secondary).
4. Determination of the Water Quality Volume (WQV) and the Water Quality Flow (WQF) shall be as specified in Wellington Water’s “Water Sensitive Design for Stormwater: Treatment Device Design Guideline” (2019).
5. Rainwater tanks that are plumbed for internal and external non-potable uses shall be incorporated into each lot design at volumes listed below; however, tank volume shall not be accounted for in stormwater runoff peak flow or volume calculations.
 - a. Roof area of 75 m² or less – 2,000 litre capacity
 - b. Roof area of 75 m² to 200 m² – 3,000 litre capacity
 - c. Roof area of more than 200 m² – 5,000 litre capacity
6. All roof runoff shall be directed to on-lot soakage designed to accommodate the 10-year ARI roof runoff volume (minimum).
7. Overland flow paths must be provided for the 100-year ARI rainfall event, regardless of whether or not soakage is being utilised for the primary network, and soakage must not be considered in the sizing calculations for the 100-year ARI overland flow path (as specified in SDRP).
8. The allowable soakage rate for stormwater design varies across the development site, based on recent soakage and geotechnical testing. For the purpose of initial design of centralised soakage basins, a soakage rate of 100 mm/hr may be applied. The developer may, and would be recommended to, carry out additional soakage tests on residential lots to inform the sizing and design of on-lot soakage devices, as per Council and industry guidelines. Evidence of the site-specific soakage testing must be provided with the engineer plans.
9. Pre-treatment is required for all runoff from non-roof impervious surfaces prior to soakage. The primary method of treatment shall be through end-of-pipe stormwater wetlands sized to accommodate the Water Quality Volume of the contributing catchment, excluding the roof areas that are connected to appropriately sized rainwater tanks and on-lot soakage. The contributing catchment shall consider adjoining development blocks within Tara-Ika as needed or as directed by Council to provide an efficient and streamlined stormwater system; that is, sizing of the treatment devices must consider the future developed upstream catchment as directed by Council. The wetland shall include a high flow

bypass into an adjoining/downstream soakage and attenuation basin, sized to bypass flows greater than the Water Quality Flow.

10. The stormwater system shall be developed with centralised treatment and soakage facilities (i.e., wetlands and soakage basins). Alternative acceptable solutions must be cost-effective and easy to maintain and should minimise the number of discrete assets that will vest into Council ownership.
11. A high-flow overland flow route out of the Tara-Ika development is considered infeasible at this time due to environmental, consenting and cost concerns. In lieu of overland flow outlets, overflow storage and soakage basins will be provided at the downstream end of all overland flow routes (in line with a centralised stormwater servicing approach), which will contain and dispose of all runoff originating from the development area up to the 100-year ARI, including climate change.

These recommended criteria can be incorporated into the Plan Change as additional Rules, Performance Standards, Assessment Criteria or “Note to Plan Users” in Chapter 15A, or as a Tara-Ika specific addendum to the SDRP with reference to such in the Plan Change Rules.

4. Summary

This memo summarises the stormwater analysis that has been completed to date by GHD and others, and presents recommended stormwater management strategies and design criteria for consideration in the Plan Change that have evolved from this body of work. It presents the evolution of strategic thinking in the stormwater servicing space, how HDC has adapted to external constraints and opportunities (i.e., consenting challenges, Ō2NL, CIP funding), and details a feasible, efficient and effective solution to enable development in Tara-Ika.

The preferred approach is to:

- adopt a centralised stormwater infrastructure system consisting of treatment wetlands and soakage basins; and
- incorporate on-lot mitigation through rainwater reuse and soakage of roof runoff.

Recommended design criteria to enable the desired stormwater outcomes are detailed in this report. These recommendations are further reinforced in the stormwater management evidence report submitted on behalf of HDC for the Plan Change, and this memo serves primarily to support this evidence through the Plan Change process.

Regards



David Arseneau
Senior Water Engineer

Attachments

Attachment 1

**Soakage Testing Report
(GHD, 2021)**



Horowhenua District Council

Tara-Ika Growth Area: Enabling Infrastructure

Soakage Testing Report

March 2021

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Appendices

Appendix A – Infiltration Test Results

DRAFT

1. Introduction

1.1 Project Background

Horowhenua District Council (HDC) are undertaking feasibility studies to support the Tara-Ika Master Plan for residential growth in the Tara-Ika Growth Area located east of State Highway 57 in Levin. This Master Plan will help ensure that new development is well designed, flexible, co-ordinated and connected to the rest of Taitoko / Levin.

GHD have been engaged by HDC to prepare a stormwater management strategy (GHD, 2020) to support master planning. As part of the stormwater management strategy, GHD has undertaken a geotechnical / soakage investigation to assess the feasibility of soakage for stormwater disposal purposes.

1.2 Structure Plan

The Draft Tara-Ika Master Plan (Local Landscape Architecture Collective, 2020) is proposed to provide for a change in land use associated with the overlay of residential, commercial and transport type activities within the identified catchment. The Tara-Ika Residential Growth Area is a new development area located to the east of State Highway 57, also known as Arapaepae Road, adjacent to the eastern boundary of urban development for the township of Levin (Figure 1).



Figure 1 Site location (extract from GHD, 2020)

This site is largely agricultural currently, with several small blocks of lifestyle-type residential developments, and is proposed to be developed to a residential and mixed-use development providing approximately 2,500 to 3,500 residential lots, commercial areas, a new school, and shared space.

1.2.1 Centralised attenuation

The draft stormwater management plan for the Tara-Ika Master Plan (GHD, 2020) has identified several permanent attenuation basins within the development and adjacent to the proposed Waka Kotahi road corridor which can provide attenuation volume as the catchment is developed to mitigate flow (Figure 2). The stormwater approach includes soakage disposal at these basin locations, which has correspondingly directed the location of soakage testing in this program.

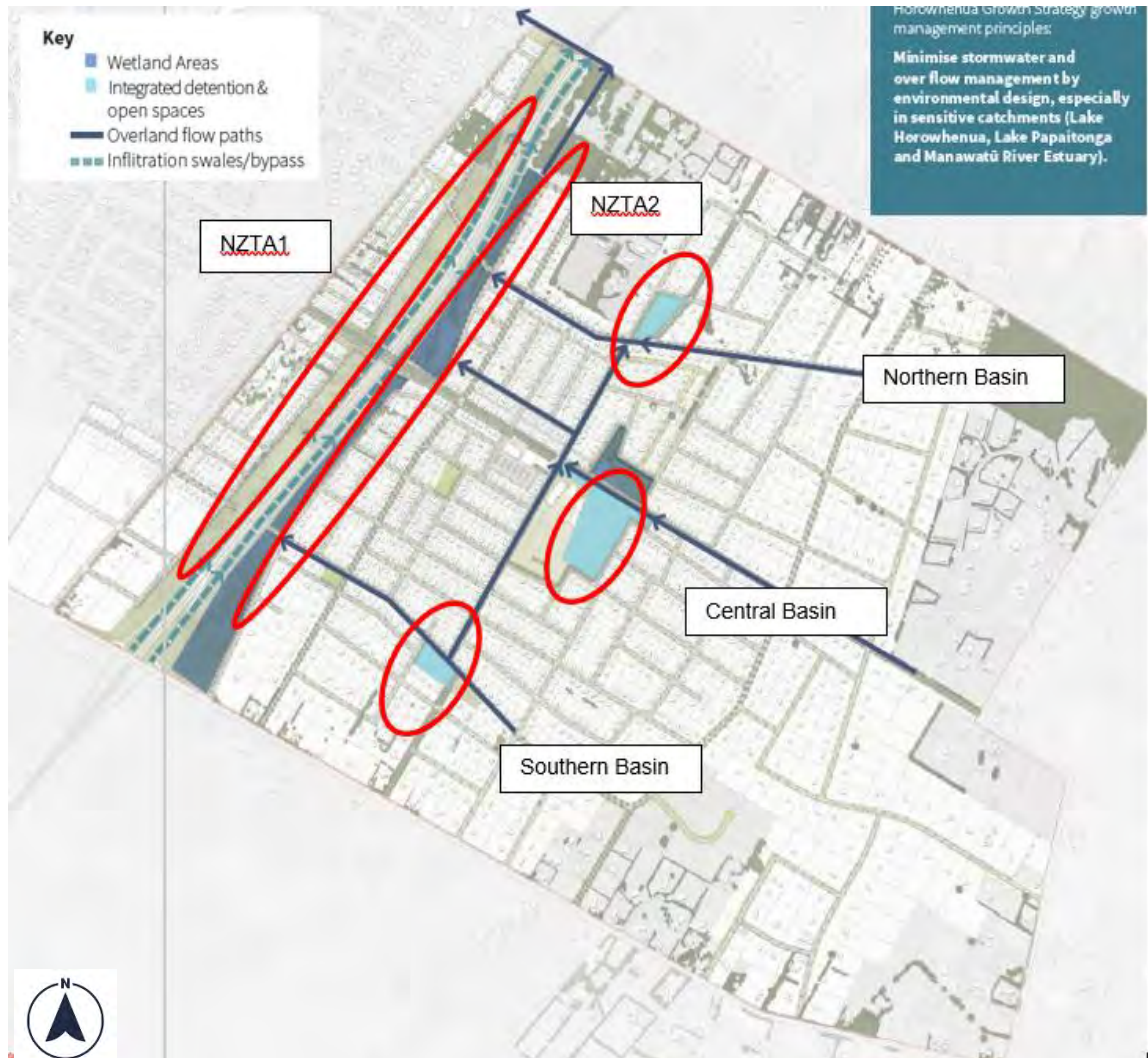


Figure 2 Proposed Development attenuation devices (extract from GHD, 2020)

1.3 Scope of Works

The works were undertaken concurrently with the ground investigation and field testing undertaken for the Geotechnical Factual Report (GHD, 2021). Groundwater level monitoring and infiltration testing (comprising five double ring infiltrometer tests) have been undertaken to increase the hydrogeological understanding of the area as well as stormwater soakage feasibility.

This report presents the results and interpretation of the infiltration testing and groundwater level monitoring undertaken to date. This report also assesses the viability for shallow infiltration soakage to be used at the site and makes recommendations for additional monitoring and testing.

1.4 Limitations

This report has been prepared by GHD for Horowhenua District Council and may only be used and relied on by Horowhenua District Council for the purpose agreed between GHD and the Horowhenua District Council as set out in section 1.1 and 1.3 of this report. GHD otherwise disclaims responsibility to any person other than Horowhenua District Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report. The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Horowhenua District Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

1.5 Assumptions

This is a factual report of hydrogeological investigations with recommendations on the feasibility of stormwater soakage. The field investigations and testing used as a basis for this assessment have been undertaken at discrete locations. No inferences about the nature and continuity of ground conditions away from the investigation locations are made. Due to the heterogeneous nature of soils and rock and limited number of sample locations undertaken, ground conditions are anticipated to vary across the site.

Due to the limited timeframe and resources available, a two-hour pre-soakage period was undertaken at each location prior to each infiltration test. The pre-soakage was only applied to the infiltrometer apparatus and not the surrounding test pit.

2. Environmental Site Setting

2.1 Regional Geology

The Geology of the greater Levin area consists of a variable sequence of sand and gravel deposits of Holocene and Quaternary age overlying greywacke bed rock of the Rakaia Terrane which forms the Tararua Ranges to the east. Figure 3 shows these geological units as compiled in the 1:250,000 geological map of the Wellington area (Begg and Johnston, 2000). The geological units are described below.

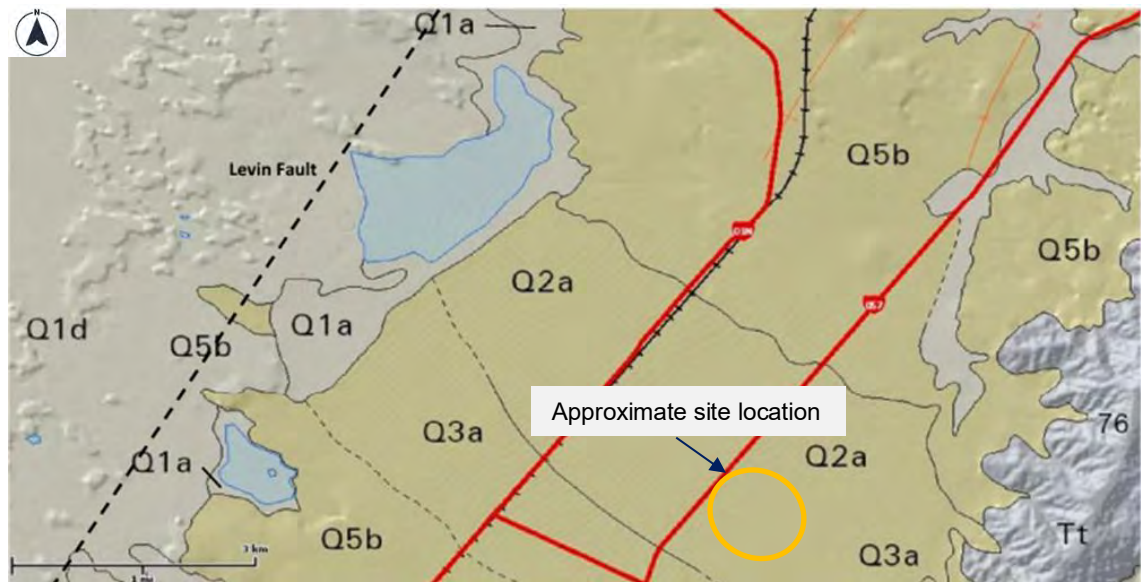


Figure 3 Geology of the Greater Levin Area (from Begg and Johnston, 2000)

These units (from youngest to oldest) consist of:

- **Q1:** Holocene sand and peat deposits overlying the older glacial gravels and marine sands generally west of the Levin Fault. Q1d consists of beach and dune deposits while Q1a consists of fine-grained swamp deposits.
- **Q2a and Q3a:** Poorly sorted gravels, sands and silts of the last glacial (Q2a) and postglacial (Q3a) periods.
- **Q5b:** Interglacial Otaki Formation shallow marine sand and silt deposits in the Levin area forming the upper surface of the Tokomaru Marine Surface.
- **Q6:** Older glacial and interglacial Levin Gravels (at depth and not exposed at the surface). This unit forms a productive aquifer at depths of 60 m to 80 m.
- **Tt:** Jurassic greywacke bedrock of the Rakaia Terrane.

The Levin Fault (shown on Figure 3) forms a “prominent major structural and hydrogeological feature which has caused the uplift of basement greywacke rock to near the present-day land surface on its western side” (Phreatos, 2005). Geological units important for water supply and groundwater flow are significantly deeper east of the fault where a relatively large thickness of sediments has accumulated in the down-dropped basin.

2.2 Regional Hydrogeology and Groundwater Flow

Groundwater in the greater Levin area flows primarily through the glacial and interglacial sand and gravel deposits, generally from the east toward the west (coast). Groundwater originates as infiltrated precipitation and as local leakage from rivers and streams. Contributions from

greywacke underlying the area as basement bedrock or exposed to the east in the Tararua Range, are expected to be minor.

Groundwater beneath Levin flows through a sequence of sand and gravels up to 500 m thick at some locations with the majority of flow within the upper 150 m. Groundwater below about 150 m in the Levin area is reportedly slow moving and of lower quality as it is trapped in part by the Levin fault which has raised greywacke to within 20 m of ground surface at some locations (Phreatos, 2005). The low-permeability greywacke raised by the Levin fault pushes groundwater upward where it discharges into local streams, rivers and Lake Horowhenua. To the west of the fault, the alluvial sequence is thinner (estimated to be some 200 m thick) with much recharge derived locally.

The geology and hydro-stratigraphy of the location of the Tara-Ika Development is expected to consist of the sequence of gravels, sands and silts described above (Q2a and Q3a: Poorly sorted gravels, sands and silts of the last glacial (Q2a) and postglacial (Q3a) periods).

2.3 Groundwater Levels

Publicly available bore and water level data was reviewed to get an understanding of groundwater levels in the vicinity of the site. Data was available on Horizon Regional Council's (HRC) Environmental Data portal (<https://www.horizons.govt.nz/environment-data>). There were numerous shallow wells (<15 m below ground level (m bgl)) in the vicinity of the site but none were utilised as long-term monitoring wells by HRC.

Long term groundwater level data were available for four wells (363251, 362033, 362521, 362661) screened between 22 and 50 m bgl. The well locations are shown on Figure 4 and their construction details are presented in Table 1. Review of the graphs indicates that groundwater levels in the area have been stable since 1991 (Figure 5) and sit generally between 5.5 and 22 m bgl (20 – 45 m above sea level).



Figure 4 Location map of HRC shallow groundwater monitoring wells

Table 1 Summary of HRC Groundwater Monitoring Bores

Bore ID	Owner	Depth (m)	Screen (m bgl)	Standing Water level (average) (m bgl)
363251	Levin Hall Trust	30	28 - 30	21.5
362033	Tararua Yarns	22.2	-	5.7
362521	A Heskett (Ex Yule)	32	27 - 29	6.7
362661	G Sue	49.3	46.3 - 49.3	18.8

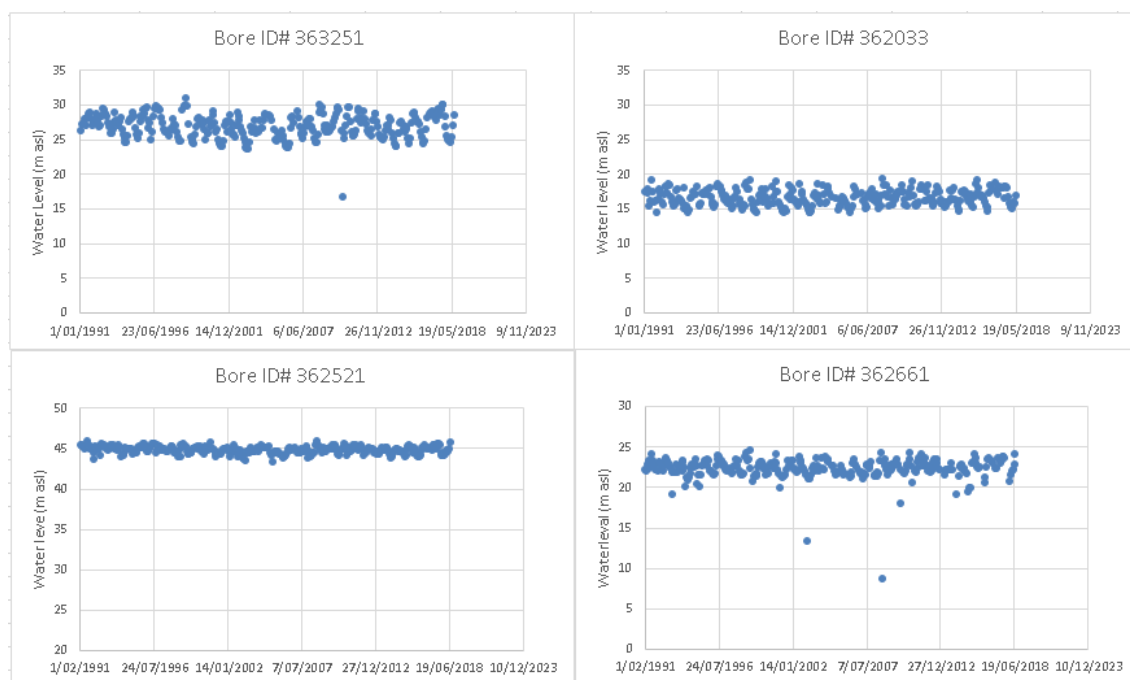


Figure 5 Groundwater Level Data from HRC Monitoring Bores

Data obtained from ground investigation for the Ōtaki to North Levin (Ō2NL) Waka Kotahi project (Stantec, 2020) was also reviewed. The location of the boreholes advanced for this project are displayed on Figure 6. In the vicinity of the proposed Tara-Ika development only one piezometer has been installed in BH118 (screened from 17-21 m bgl) with groundwater levels ranging from 17.2 to 19.5 m bgl.

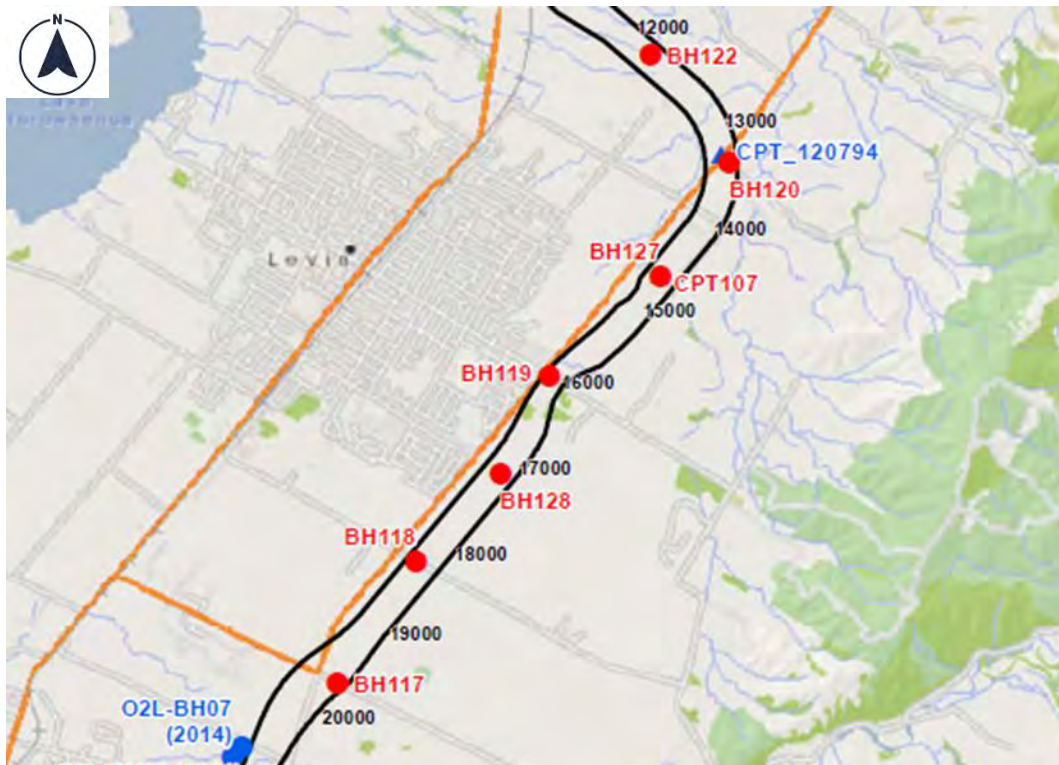


Figure 6 Site Investigation Locations for O2NL (extract from Stantec, 2020)

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3. Site Investigation

The geotechnical ground investigation undertaken for this project is summarised in the Geotechnical Factual Report (GHD, 2021). Seven piezometers were installed during the ground investigation undertaken between 9 December and 17 December 2020. The location of the installed piezometers are shown in Figure 7.

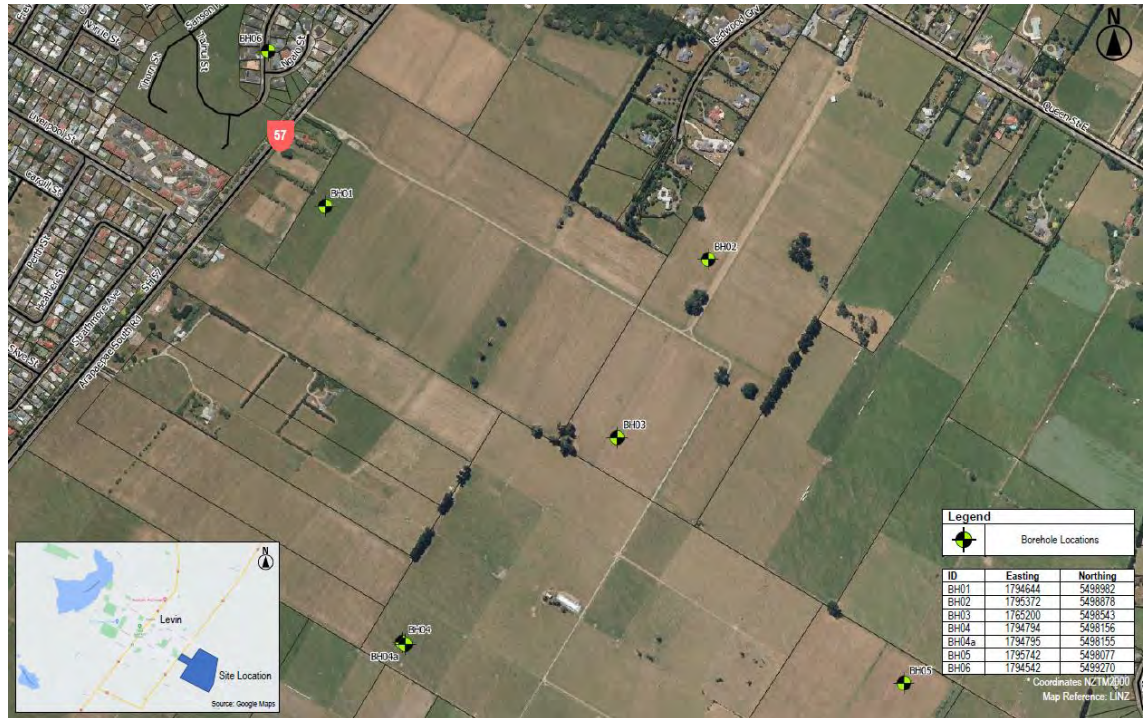


Figure 7 Piezometer Location Plan

Piezometer details are listed below in Table 2 and a brief summary of encountered geology is included in Section 4.1. These piezometer / locations were used for further infiltration testing or groundwater level monitoring.

Table 2 Tara-Ika Piezometer Details

Borehole ID	Depth (m bgl)	Elevation* (m RL)	Screen (m bgl)
BH01	15.00	63	9.50 – 12.50
BH02	10.00	64	2.50 – 5.50
BH03	10.00	64	2.00 – 6.00
BH04	10.00	65	7.50 – 9.50
BH04a	5.00	65	2.50 – 4.50
BH05	10.00	65	6.50 – 9.50
BH06	10.00	66	6.00 – 9.00

*Elevations are in terms of NZVD2016 and were collected with a handheld GPS

3.1 Groundwater Level Monitoring

The standpipe piezometers were developed by Griffiths Drilling Limited on 14th of January 2021. Following well development, GHD suspended Solinst Leveloggers in each piezometer, set to record groundwater levels and temperature every 15 minutes. Manual groundwater measurements have been collected during site visits and a barologger has been installed in the headspace of BH03 to allow barometric compensation of water levels.

The loggers remain in place to provide a continuous record of water levels for HDC, and the first week of logging (22 to 29 January 2021) has been presented in this report. BH04 and BH04a were inaccessible on the 22nd of January, but loggers have since been installed during a subsequent site visit.

3.2 Double Ring Infiltrometer

3.2.1 Test Description

Double ring infiltrometer (DRI) testing is a procedure which allows field measurements of the rate of water infiltration into soils. This method consists of driving two open cylinders, one inside the other, into the ground, partially filling the rings with water and maintaining a constant level for a certain number of timed intervals. The volume infiltrated during each interval is converted to an incremental infiltration velocity. The steady state or minimum incremental infiltration velocity is typically equivalent to the infiltration rate.

Tests must be undertaken above the water table. The testing was undertaken in accordance with ASTM International Standards, D 3385-03, *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer*.

3.2.2 DRI Test Summary

Five test pits were excavated by JCM Excavation Ltd with a 12-tonne excavator on 13 and 14 January 2021 to facilitate infiltration testing with a DRI. The excavator prepped each site by removing topsoil to target the sandy gravel layer encountered between 0.25 and 1.5 m bgl. The DRIs were then embedded into the ground to form a good seal. These tests were each undertaken close to the installed piezometers (BH01 - BH04). Test pit 05 however was set 70 m NW of BH05 at the request of the property owner at the time of testing. An example test site set up of the DRI is shown in Figure 8.

Infiltration testing was undertaken on the 14th of January 2021 using a 0.15 m inner and 0.3 m outer diameter DRI and the test was conducted in three stages:

Seal testing. The outer ring was initially filled with water to verify the seal integrity. If a poor seal was observed, the rings were hammered further into the ground.

Pre-soakage. Both the outer and inner rings were filled with an equal water depth of approximately 7 cm above ground level. Water was maintained in the rings for approximately 2 hours for each test.

Falling head test. The outer and inner rings were filled with approximately 7 cm of water above the base of the pit. Water level measurements in the inner ring were taken at a prescribed interval while water was allowed to drain. The outer ring was kept topped up to the same level as the inner ring during the test. Tests continued until the water level drained completely. Each falling head test lasted between 7 and 33 minutes.



Figure 8 DRI Test Set Up

4. Site Investigation Results

4.1 Local Geology

The major soil types encountered in the borehole investigation are described in Table 3. In summary, each position generally encountered a topsoil overlying a sandy/silty fine to coarse gravel. Some positions (BH02, BH03, and BH04) encountered a 0.7 to 1.0 m thick silt layer at around 6 to 6.5 m bgl. The extent of these silt layers is not confirmed.

Table 3 Summary of Encountered Geology

Bore ID	Depth (m bgl)	Geology
BH01	15.0	0.0 – 1.5 SILT 1.5 – 13.95 Sandy / silty fine to coarse GRAVEL 13.95 – 15 Fine to medium SAND
BH02	10.0	0.0 – 0.4 SILT / Gravelly SILT 0.4 – 6.5 Sandy / silty fine to coarse GRAVEL 6.5 – 7.4 SILT, minor gravel 7.4 – 9.0 Silty fine to coarse GRAVEL 9.0 – 10.0 SILT
BH03	10.0	0.0 – 0.25 SILT 0.25 – 6.0 Sandy / silty fine to coarse GRAVEL 6.0 – 6.7 SILT, minor gravel 6.7 – 8.8 Sandy fine to coarse GRAVEL 8.8 – 9.0 SILT 9.0 – 10.0 Silty fine to coarse GRAVEL
BH04	10.0	0.0 – 0.3 SILT / Gravelly SILT 0.3 – 6.45 Sandy / silty fine to coarse GRAVEL 6.45 – 7.5 SILT, some clay 7.5 – 10.0 Silty fine to coarse GRAVEL
BH05	10.0	0.0 – 0.65 SILT / Gravelly SILT 0.65 – 1.0 Sandy fine to coarse GRAVEL 1.0 – 1.5 Core loss 1.5 – 10.0 Silty / sandy fine to coarse GRAVEL
BH06	10.0	0.0 – 1.5 No recovery (Hydrovac) 1.5 – 10.0 Sandy / silty fine to coarse GRAVEL

4.2 Groundwater Level Observations

Groundwater measurements collected on the 22nd of January and 9th of February 2021 (post piezometer development) are summarised in Table 4.

Table 4 Groundwater Level Measurements

Bore ID	Depth (m bgl)	Screen (m bgl)	Water Level (m bgl) 22/01/2021	Water Level (m bgl) 09/02/2021
BH01	15.0	9.5 – 12.5	12.3	Dry
BH02	10.0	2.5 – 5.5	Dry	Dry
BH03	10.0	2.0 – 6.0	Dry	Dry
BH04	10.0	7.5 – 9.5	Inaccessible	9.0
BH04a	5.0	2.5 – 4.5	Inaccessible	4.4
BH05	10.0	6.5 – 9.5	9.0	9.1
BH06	10.0	6.0 – 9.0	8.9	8.8

There were no significant rainfall events during this logging period and no large fluctuations in water levels recorded. The water level plots from BH01 and BH06 are shown in Figure 9. The other levelloggers were either unable to be suspended below the short water column or were dry at the time of levellogger deployment. In summary, water levels showed minimal fluctuation (<0.02 m) or no recovery in dry / low water level wells. Long-term monitoring is anticipated to show seasonal fluctuations as well as fluctuations to climatic events. The water level observations made to date indicate that the groundwater table at the site is ~ 9 m bgl. A perched groundwater table was encountered at the BH04a location where groundwater level was measured at 4.36 m bgl.

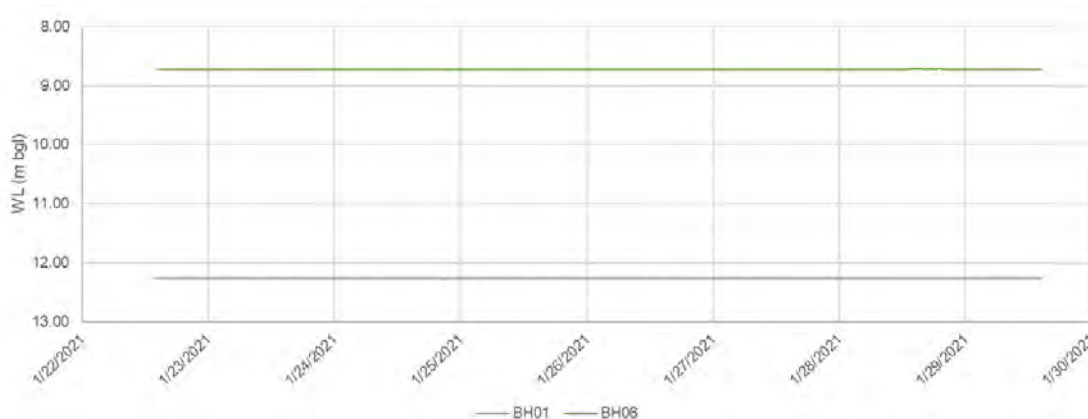


Figure 9 Water Level Records BH01 and BH06

4.3 Double Ring Infiltrometer Test Results

The DRI test results and the observed geology of the tested materials are summarised in Table 5 and Figure 10. The logs are incorporated into the Geotechnical Factual Report (GHD, 2021) and full infiltration test results are presented in Appendix A. Groundwater was not encountered in any test pits and was measured in the nearby borehole at depths generally greater than 9 m

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bgl with the exception of BH04A where a shallower perched groundwater table was encountered.

The **raw** shallow infiltration rates range from between 60 and 240 mm/hr. A steady-state infiltration rate was not reached by the end of the test. Therefore, the minimum infiltration rate from each test is used as the representative infiltration rate at that location (as recommended in CIRIA, 2015).

Table 5 Summary of DRI Test Results

Test ID	Ground Level (mRL)	Test Depth (m)	Geology	Raw infiltration rate (mm/hr)	Raw infiltration rate (m/s)
TP01	63	1.3	Sandy fine to coarse GRAVEL some silt, trace cobbles	240	7×10^{-5}
TP02	64	0.8	Sandy fine to coarse GRAVEL	60	2×10^{-5}
TP03	64	0.5	Sandy fine to coarse GRAVEL	120	3×10^{-5}
TP04	65	0.8	Sandy fine to coarse GRAVEL	120	3×10^{-5}
TP05	65	0.7	Sandy fine to coarse GRAVEL, some silt	60	2×10^{-5}

The test results indicate that there is no clear spatial pattern or correlation between fines content and infiltration rate. BH02, BH03 and BH04 did not show any indication of a decreased infiltration rate with the presence of the silt layers at depth, however the influence of these confining layers may be evident during soakage testing with larger water volumes for a longer period of time.



Figure 10 Map of DRI Raw Test Results

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5. Feasibility of Soakage

5.1 Shallow Infiltration

For soils to be suitable for infiltration designs, it should be permeable, unsaturated, and of sufficient thickness and extent to disperse the water effectively.

The geotechnical ground investigation identified 0.25 to 1.5 m of silt / gravelly silt overlying sandy to silty gravels. Three positions encountered 0.7 to 1.0 m thick silt interbedded within this gravel unit at approximately 6 to 6.5 m depth. The spatial extent and variability of these semi-confining layers has not been confirmed but was observed in a SW / NE trending line intersecting BH02, BH03 and BH04.

CIRIA (2015) notes that for infiltration tests to reflect realistic conditions, it is recommended that the tests be repeated three times. Repeating the test may reduce the measured infiltration rate by half an order of magnitude each time the test is repeated. Due to programme constraints this was not possible during the geotechnical investigation though some limited pre-soak was undertaken. A factor of safety (FoS) is recommended to be applied to the results from Table 5 to account for the shortened pre-soak and potential long-term reductions in the infiltration rate(s).

CIRIA (2015) provides a wider range of FoS recommendations depending on the size of the area to be drained and the consequences of failure (Figure 11). The selected FoS is also dependent on the final stormwater design (i.e. use of secondary flow paths, number of centralised devices controlling flow from wider area).

Suggested factors of safety, F, for use in hydraulic design of infiltration systems (designed using Bettess (1996). Note: not relevant for BRE method)			
Size of area to be drained	Consequences of failure		
	No damage or inconvenience	Minor damage to external areas or inconvenience (eg surface water on car parking)	Damage to buildings or structures, or major inconvenience (eg flooding of roads)
< 100 m ²	1.5	2	10
100–1000 m ²	1.5	3	10
> 1000 m ²	1.5	5	10

Figure 11 Recommended factors of safety (source: CIRIA, 2015)

Assuming the design incorporates secondary (overland) flow paths such that roads will not flood, finished floor levels of buildings that are sufficiently high enough to be above any resultant flood levels and there are no basements proposed, then a FoS of 5 would be applicable. The FoS may be able to be further reduced (to 3 or 1.5) if the area to be drained can be reduced by using multiple, distributed devices and overland flow paths. Table 6 presents the infiltration rates with the CIRIA factors of safety applied; cells highlighted grey reflect the recommended FoS of 3 to 5.

Soils with a high volume of fine-grained particles such as silt and clay, as encountered on site at the surface or as a minor fraction of the gravel, are generally considered poor infiltration media. However, CIRIA recommends that infiltration viability should be given full consideration where rates of 3.4 mm/hr or greater exist. The factored (10 to 1.5) long-term infiltration rate estimates outlined in Table 6 indicate rates between 6 and 160 mm/hr, suggesting that the site, in general, is likely suitable for soakage (based on infiltration rate alone, see further commentary below on groundwater level).

Table 6 Infiltration Rates with FoS

Test ID	Raw infiltration rate (mm/hr)	Long Term Infiltration Rate mm/hr (L/min/m ²)				Inferred GW Depth (m bgl)
		FoS=1.5	FoS = 3	FoS = 5	FoS = 10	
		No damage or inconvenience is anticipated due to overland flow	Design includes overland flow paths, drained area < 1000 m ²	Design includes overland flow paths, drained area > 1000 m ²	No overland flow paths	
TP01	240	160	80	48	24	deep (>9 m)
TP02	60	40	20	12	6	deep (>9 m)
TP03	120	80	40	24	12	deep (>9 m)
TP04	120	80	40	24	12	moderate >4 m
TP05	60	40	20	12	6	deep (9 m)

Another factor for soakage viability in this assessment is depth of the groundwater level compared to the depth of the infiltration device. Soakage guidelines recommend that the base of the soakage device / soakage basins should be at least 1 m above the maximum anticipated groundwater levels. Groundwater levels have been observed to be relatively deep (>9 m) in most bores, with the exception of the shallow BH04a which has been observed to be dry or occasionally reporting water levels between 4 – 4.5 m bgl. These groundwater levels are considered deep enough to account for likely seasonal variation during the winter seasons and or following heavy rainfall events, but long-term monitoring is recommended to confirm the water level fluctuations. The groundwater levels in surrounding 20-50 m deep bores indicate water levels are fairly stable, fluctuating within 3-5 m each season. Long term groundwater monitoring data from levelloggers currently suspended in the on-site piezometers will provide further information about the groundwater fluctuations.

5.2 Environmental Impacts

The assessment above has considered only the site-specific results with regards to likely infiltration / soakage rate and groundwater level. However, where wide-scale disposal of stormwater is utilised it is also important to consider the potential for adverse environmental effects such as:

- Localised mounding (rise of groundwater level) that could result in flooding of basements and / or buoyancy of services
- Localised mounding (rise of groundwater level) that could result in an increase to the volume of groundwater being discharged to the wider drainage system
- Increase in groundwater flows downgradient of the site which could increase groundwater discharge nearby streams or to Lake Horowhenua
- Increase in groundwater levels downgradient of the site that could reduce soakage capacity in areas already utilising soakage.

This investigation report does not include an assessment of the above, as it would require an analysis of longer-term groundwater level data that demonstrates level response to changing seasons and precipitation events. However, it is recommended this analysis be completed to support a regional consent for stormwater discharge as data becomes available.

6. Conclusions and Recommendations

Horowhenua District Council are undertaking feasibility studies to support the Tara-Ika Master Plan for residential growth in Tara-Ika Growth Area located east of State Highway 57 in Levin. Groundwater monitoring and soakage testing was undertaken to provide a preliminary assessment of whether soakage can be used to provide hydrological mitigation to stormwater events.

A ground investigation has been undertaken to understand the shallow geology, groundwater system, and shallow infiltration rates. Ground investigations have identified surficial silts and gravelly silts to a depth of 0.25 to 1.5 m bgl overlying silty/sandy gravels. Three exploratory positions encountered a 0.7 to 1.0 m thick silt lens around 6 to 6.5 m bgl.

Data loggers have been installed within six piezometers across the site to record future water levels to provide an indication of seasonal and climatic groundwater level variation.

Groundwater levels are generally >9 m bgl with shallow groundwater occasionally present in BH04a (screened to 4.5 m bgl).

Preliminary infiltration testing has been undertaken in the form of five double ring infiltrometer (DRI) tests. The **raw** infiltration rates range between 60 to 240 mm/hr with no clear spatial pattern or correlation between fines content and infiltration rate. When a factor of safety is applied to these results to estimate long term infiltration capacity, the rates range from 20 to 80 mm/hr assuming the lot size (drained area) is less than 1000 m² and the consequence of failure is minor.

The results of the soil infiltration investigations (when considered as factored infiltration rates to account for uncertainties in design and long-term performance) indicate that soakage is likely feasible across the site. However site-specific infiltration testing at any location intended for shallow soakage is recommended in order to size the individual soakage devices appropriately.

There is still uncertainty around the seasonal fluctuation of the water levels around the site, potential mounding effects with corresponding down-gradient impacts, as well as the extent and variation in the confining silt layer observed in BH02, BH03, and BH04 and the degree to which this may limit the volume and rate of water which can easily infiltrate the subsurface. Therefore, we recommend the download of the loggers and review of groundwater level monitoring data every 3 -4 months to assess groundwater level variation and response to climatic events.

7. References

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Appendices

Appendix A – Infiltration Test Results

Double Ring Infiltrometer Test			
Job Name	Tara-Ika Growth Area		
Client	Horowhenua District Council		
Job Number	12536997	Tested by	GHD
Test ID	TP01	Start Date & Time	14/01/2021 11:00
Location	Tara-Ika - East of Levin		
Groundwater level	11.4 m bgl (<i>pit dry, GWL measured in adjacent borehole BH01</i>)		
Pre-soak?	Yes	Maintained full for 2 hours	
Pre-soak commenced	9:00 AM	Width of test pit (m)	1.0 x 1.0
Pre-soak completed	11:00 AM	Base of test (m bgl)	1.30
Rings used	0.15 m inner, 0.3 m outer		

Time (sec)	Water level (above base of pit)		Rate (mm/hr)
	(m)	(mm)	
0	0.075	75	
30	0.07	70	600
60	0.064	64	720
90	0.06	60	480
120	0.054	54	720
150	0.049	49	600
180	0.045	45	480
210	0.039	39	720
240	0.034	34	600
270	0.03	30	480
300	0.025	25	600
330	0.023	23	240
360	0.018	18	600
390	0.012	12	720
420	0.005	5	840

Double Ring Infiltrometer Test			
Job Name	Tara-Ika Growth Area		
Client	Horowhenua District Council		
Job Number	12536997	Tested by	GHD
Test ID	TP02	Start Date & Time	14/01/2021 11:00
Location	Tara-Ika - East of Levin		
Groundwater level	DRY - assume below 9 m bgl (pit dry, GWL measured in adjacent borehole BH02)		
Pre-soak?	Yes	Maintained full for 2 hours	
Pre-soak commenced	9:00 AM	Width of test pit (m)	0.95 x 1.5
Pre-soak completed	11:00 AM	Base of test (m bgl)	0.80
Rings used	0.6 m inner, 0.9 m outer		

Time (sec)	Water level (above base of pit)		Rate
	(m)	(mm)	(mm/hr)
0	0.08	80	
30	0.079	79	120
60	0.075	75	480
120	0.074	74	60
180	0.07	70	240
240	0.065	65	300
300	0.064	64	60
360	0.063	63	60
420	0.06	60	180
480	0.058	58	120
540	0.056	56	120
600	0.055	55	60
660	0.052	52	180
720	0.05	50	120
780	0.049	49	60
840	0.048	48	60
900	0.046	46	120
960	0.045	45	60
1020	0.044	44	60
1080	0.043	43	60
1140	0.04	40	180
1200	0.039	39	60
1260	0.038	38	60
1320	0.035	35	180
1380	0.033	33	120
1440	0.031	31	120
1500	0.028	28	180
1560	0.025	25	180
1620	0.023	23	120
1680	0.02	20	180
1740	0.015	15	300

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1800	0.012	12	180
1860	0.01	10	120
1920	0.005	5	300
1980	0	0	300

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Double Ring Infiltrometer Test			
Job Name	Tara-Ika Growth Area		
Client	Horowhenua District Council		
Job Number	12536997	Tested by	GHD
Test ID	TP03	Start Date & Time	14/01/2021 11:55
Location	Tara-Ika - East of Levin		
Groundwater level	>6 m bgl (inferred from BH03 levels)		
Pre-soak?	Yes	Ran out of water after 1.75 hours	
Pre-soak commenced	9:45 AM	Width of test pit (m)	1.0 x 1.7
Pre-soak completed	11:45 AM	Base of test (m bgl)	0.50
Rings used	0.15 m inner, 0.3 m outer		

Time (sec)	Water level (above base of pit)		Rate
	(m)	(mm)	(mm/hr)
60	0.07	70	
120	0.068	68	120
180	0.064	64	240
240	0.06	60	240
300	0.058	58	120
360	0.056	56	120
420	0.052	52	240
480	0.049	49	180
540	0.046	46	180
600	0.043	43	180
660	0.04	40	180
720	0.038	38	120
780	0.036	36	120
840	0.034	34	120
900	0.032	32	120
960	0.03	30	120
1020	0.028	28	120
1080	0.025	25	180
1140	0.02	20	300
1200	0.017	17	180
1260	0.015	15	120
1320	0.01	10	300
1380	0.005	5	300

Double Ring Infiltrometer Test			
Job Name	Tara-Ika Growth Area		
Client	Horowhenua District Council		
Job Number	12536997	Tested by	GHD
Test ID	TP04	Start Date & Time	14/01/2021 11:55
Location	Tara-Ika - East of Levin		
Groundwater level	>4.3 m bgl (inferred from previous BH04 levels)		
Pre-soak?	Yes	Maintained full for 1.75 hours	
Pre-soak commenced	1:15 PM	Width of test pit (m)	0.65 x 0.92
Pre-soak completed	3:00 PM	Base of test (m bgl)	1.60
Rings used	0.15 m inner, 0.3 m outer		

Time (sec)	Water level (above base of pit)		Rate
	(m)	(mm)	(mm/hr)
0	0.079	79	
60	0.075	75	240
120	0.069	69	360
180	0.064	64	300
240	0.06	60	240
300	0.058	58	120
360	0.055	55	180
420	0.05	50	300
480	0.046	46	240
540	0.044	44	120
600	0.04	40	240
660	0.038	38	120
720	0.035	35	180
780	0.03	30	300
840	0.025	25	300
900	0.02	20	300
960	0.015	15	300
1020	0.01	10	300
1080	0.005	5	300

Double Ring Infiltrometer Test			
Job Name	Tara-Ika Growth Area		
Client	Horowhenua District Council		
Job Number	12536997	Tested by	GHD
Test ID	TP05	Start Date & Time	14/01/2021 11:55
Location	Tara-Ika - East of Levin		
Groundwater level	>9 m bgl (inferred from piezo)		
Pre-soak?	Yes	Maintained full for 2.75 hours	
Pre-soak commenced	5:40 AM	Width of test pit (m)	1.0 x 1.6
Pre-soak completed	8:20 AM	Base of test (m bgl)	0.70
Rings used	0.15 m inner, 0.3 m outer		
Notes	Test undertaken 70 m NW of piezo (BH05)		

Time (sec)	Water level (above base of pit)		Rate
	(m)	(mm)	(mm/hr)
0	0.07	70	
60	0.065	65	300
120	0.063	63	120
180	0.06	60	180
240	0.058	58	120
300	0.055	55	180
360	0.053	53	120
420	0.05	50	180
480	0.049	49	60
540	0.048	48	60
600	0.047	47	60
660	0.046	46	60
720	0.045	45	60
780	0.043	43	120
840	0.042	42	60
900	0.038	38	240
960	0.036	36	120
1020	0.034	34	120
1080	0.033	33	60
1140	0.032	32	60
1200	0.031	31	60
1260	0.03	30	60
1320	0.029	29	60
1380	0.028	28	60
1440	0.027	27	60
1500	0.026	26	60
1560	0.025	25	60
1620	0.024	24	60
1680	0.023	23	60
1740	0.022	22	60

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GHD

Level 3

138 Victoria Street

T: 64 3 378 0900 F: E: chcmail@ghd.com

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0	N. Simpson	D. Avaniidou		A.R. Baugham		

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Appendix 10: Statement of Evidence – Stormwater

IN THE MATTER of the Resource Management Act
1991 (**RMA**)

AND

IN THE MATTER of a hearing by the Horowhenua
District Council on Proposed Plan
Change 4: Taraika Growth Area to
the Horowhenua District Plan.

**EVIDENCE OF DAVID ARSENEAU
ON BEHALF OF HOROWHENUA DISTRICT COUNCIL
Stormwater Management Specialist
10 October 2021**

1. QUALIFICATIONS AND EXPERIENCE

1. My full name is David Christopher Arseneau. I hold a degree in Civil Engineering with a specialisation in Water Resources from the University of Waterloo (Canada), obtained in 2008, and a Master of Engineering in Public Policy degree from McMaster University (Canada), obtained in 2011. I am a licensed Professional Engineer (P.Eng.) in the Canadian province of Ontario (since 2011) and a Chartered Member of Engineering New Zealand (CMEngNZ).
2. I am a Senior Water Engineer, with 13 years of experience in stormwater management, flood assessment and mitigation, erosion and sediment control, and the restoration of natural streams.
3. I have been a practicing water resources engineer since 2008 and have been working in New Zealand since August 2019. I have experience in the analysis, design and construction of a variety of water resources infrastructure in Canada, including stormwater management systems/facilities, drainage improvements, flood risk assessments and river engineering works. In New Zealand I have undertaken development of stormwater management plans for large residential developments in New Zealand beyond Tara-Ika, such as the Aokautere and Kākātangiata growth areas in Palmerston North (approximately 250 ha and 690 ha in size, respectively), and have worked with local Councils on numerous smaller subdivision reviews and stormwater management plans. I have also undertaken design of stormwater attenuation facilities for local Councils, fish passage assessments in urban streams, and stopbank upgrades for flood protection. I have been engaged by Horowhenua District Council (**HDC**) since September 2020

to assist with the planning, design and implementation of enabling infrastructure for Tara-Ika, with a particular focus on stormwater management.

4. I advise that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise and I have not omitted material facts known to me that might alter or detract from my evidence.

2. SCOPE OF EVIDENCE

5. I have been asked to provide evidence in relation to the stormwater management approach to support this development. I authored the *Tara-Ika Growth Area: Summary of Stormwater Management Analysis and Strategy, dated 16 July 2021* (the **Stormwater Assessment**), as well as several of the supporting technical documents described in the Stormwater Assessment, in which the recommended stormwater servicing approach for Tara-Ika is described. These elements are discussed further in my evidence below. I have read the submissions received on the Application and the Report prepared in accordance with s42a of the RMA (the **Council Report**).
6. My evidence will cover the following matters:
 - a. Stormwater analysis completed to date and expected future servicing requirements for the Tara-Ika Growth Area;
 - b. Comments on submissions; and
 - c. Conclusions.

3. RELEVANT FACTS AND CONTEXT

7. In this statement of evidence, I do not repeat the Project description and refer to the summary of the Application in the evidence of Lauren Baddock on behalf of Horowhenua District Council.

4. PURPOSE OF THE STORMWATER ASSESSMENT

8. The purpose of GHD's work on stormwater matters for the Tara-Ika Plan Change is to assist Horowhenua District Council (**Council**) with development of a stormwater servicing strategy and design criteria for Tara-Ika. Further details are included in the attached Stormwater Assessment.

5. STORMWATER ANALYSIS COMPLETED TO DATE

9. The stormwater work completed to date by GHD and others is described in the attached Stormwater Assessment.
10. Key points of the Stormwater Assessment that are of interest to submitters, and are therefore highlighted specifically in this evidence report, include the following:
 - a. Evaluation of stormwater discharge options (i.e., where to direct stormwater runoff) has prompted Council to adopt a “Zero-Discharge” stormwater servicing approach, wherein runoff up to the 100-year average recurrence interval (**ARI**) rainfall event, including the effects of climate change, is contained and infiltrated entirely within the Tara-Ika development area, with no runoff directed to Lake Horowhenua or Koputaroa Stream. To this end, Council has carried out soakage testing of soils in Tara-Ika and are monitoring groundwater levels in several locations to confirm design parameters for this approach.
 - b. Council has been working in close collaboration with Waka Kotahi to develop an integrated stormwater management solution for Tara-Ika and the proposed Ōtaki to North of Levin (**Ō2NL**) Expressway, which is currently aligned through the western portion of Tara-Ika. The “Zero-Discharge” approach is one method to minimise conflict between the two projects and promote effective stormwater management solutions. This collaboration also provides a viable stormwater servicing strategy for Tara-Ika should soakage no longer be feasible in the future.
 - c. The stormwater system has been conceptually designed as a centralised system to service the entire Tara-Ika development, independent of property boundaries, in an effort to enable development in an expedited and cost-effective manner. Council has also initiated measures to ensure financial equity for affected landowners, although these measures are outside the scope of this evidence report and the Plan Change provisions.
 - d. Council, with the assistance of GHD, has developed draft stormwater design criteria to provide clarity to landowners and developers, addressing gaps in existing plans and standards that do not achieve the desired stormwater performance outcomes for Tara-Ika. These are summarised in Section 3.3 of the attached Stormwater Assessment.

6. EXPECTED FUTURE STORMWATER SERVICING

11. The proposed stormwater servicing approach for Tara-Ika is described in the attached Stormwater Assessment, and includes the following components:

- a. Detention, reuse and disposal of runoff from roofs, up to the 10-year ARI rainfall event, using a combination of rainwater tanks, internal greywater plumbing systems and on-lot soakage devices for each residence. Roof runoff is reused and soaked directly due to the typically low amount of contaminants in runoff from these sources.
 - b. Conveyance of runoff through piped reticulation (up to 10-year ARI) and road-based overland flow routes (up to 100-year ARI) to centralised stormwater treatment wetlands and soakage basins. Treatment wetlands are sized to treat first-flush runoff from all impervious surfaces excluding roofs; soakage basins are sized to retain and soak the 100-year ARI storm event flow and volume with no overflow discharges to downstream environments.
 - c. Proposed stormwater design criteria to achieve the desired stormwater outcomes are summarised in Section 3.3 of the attached Stormwater Assessment; these criteria are recommended to be included as provisions in the Plan Change.
12. GHD in collaboration with Council has recommended adoption of a servicing strategy that uses centralised treatment wetlands and soakage basins that service multiple upstream landowners. This approach was assessed in the context of a number of benefits and drawbacks, including:
- a. Benefits in future operations and maintenance requirements, due to having fewer overall stormwater devices to monitor and maintain.
 - b. More efficient use of development area through elimination of redundant setbacks, maintenance areas, batters, etc., associated with multiple smaller stormwater facilities, leading to higher lot yields and simplifying servicing requirements for landowners.
 - c. Improved risk mitigation for downstream environments (Lake Horowhenua and Koputaroa Stream) and urban areas (flooding in urban Levin) through Council-led centralised stormwater controls.
 - d. Improved risk mitigation within Tara-Ika, as many properties currently discharge stormwater through other properties in the development area; this condition necessitates an integrated stormwater solution between adjoining landowners regardless of Council's servicing approach, and centralised Council-led solutions simplifies this process for landowners and improves overall outcomes.
 - e. Potential challenges with staging of development areas on multiple properties that are dependent on downstream conveyance infrastructure through the properties of other landowners.

- f. Financial equity for landowners on whose properties the proposed stormwater devices will be located to service the wider development.
- 13. Conceptual footprints for treatment wetlands and soakage basins are illustrated in Section 2.9 of the attached Stormwater Assessment, in a figure dated March 2021. These locations are indicative only and will depend on the development layout of affected properties. It is intended that the Plan Change provisions include requirements for treatment wetland and soakage basin volume and footprint on a development-area basis, or detailed stormwater design criteria to enable calculation of such, to be incorporated into development designs at the subdivision stage. This approach provides flexibility in development design while achieving desired outcomes. In order to enable development and provide a clear way forward for landowners, Council intends to identify stormwater device locations in collaboration with affected landowners immediately following the Plan Change process and will work to design and construct key facilities.
- 14. Stormwater servicing has been developed in consideration of the Ō2NL expressway through minimising the risk of overflows that could impact the corridor (by detaining the 100-year ARI flow), minimising the need for siphons or pumps to convey runoff under the corridor (by soaking the 100-year ARI volume), and by providing additional buffer between the corridor and adjacent development (through locating stormwater facilities along the corridor). As well, consideration of the Ō2NL expressway in the stormwater servicing strategy, and collaboration with Waka Kotahi on the development of an integrated approach, provides a potential servicing solution in the event that soakage cannot be achieved.

7. COMMENTS ON SUBMISSIONS

- 15. In reviewing submissions, I have identified key recurring themes relating to the work completed by GHD for this Project. To aid in the brevity of this evidence, I respond to the key themes identified below with accompanying tailored responses to specific submissions where appropriate.

Theme #1 – impacts of centralised stormwater infrastructure to landowners

- 16. Some submitters have identified issues related to the provision of stormwater management infrastructure over and above what is required to service development on the individual landowner's properties, which is recommended in Council's Structure Plan as part of a centralised servicing strategy. Concerns raised by submitters relate primarily to the additional costs that are inferred to be required by individual developers to service development on other properties. Refer submissions **04/24 Haddon Preston**, **04/33 Truebridge Associates** and **04/38 Prouse Trust Partnership** in particular.

17. Locations of proposed wetlands and soakage facilities shown in the Stormwater Assessment and supporting Plan Change documents are indicative at this stage and will be based in part on the subdivision scheme plans developed by individual landowners. GHD recommends implementation of centralised facilities to service the growth area as a whole, as this is more effective and efficient at achieving stormwater quality and quantity objectives, requiring less overall land and improving both better lot yield and better stormwater outcomes. Council has initiated measures to ensure financial equity for affected landowners, such as direct land purchase, private developer agreements and development charge arrangements; although these measures are outside the scope of this evidence report and the Plan Change provisions, it is my opinion that Council is being appropriately proactive in enabling stormwater services for Tara-Ika.

Theme #2 – impacts to Lake Horowhenua and Koputaroa Stream, and capacity of the existing and proposed systems to accommodate Tara-Ika

18. Some submitters have identified a range of concerns related to potential stormwater impacts on Lake Horowhenua and/or Koputaroa Stream, as well as the capacity of the existing environment or proposed stormwater system to accommodate the Tara-Ika development. Refer submissions **04/01 Sue-Ann Russell, 04/07 Geoff Kane, 04/15 Gwyneth Schibli, 04/19 Michael Harland, 04/21 Fire and Emergency New Zealand, 04/26 Horowhenua District Residents and Ratepayers Association, 04/30 Horizons Regional Council and 04/39 Charles Rudd** in particular.
19. This evidence report and attached Stormwater Assessment demonstrate Council's strategy for a "Zero-Discharge" stormwater servicing approach with a combination of treatment wetlands and soakage/attenuation basins, with no runoff directed to Lake Horowhenua or Koputaroa Stream up to the 100-year ARI flow, including the effects of climate change. No additional water quantity or quality strain is expected to be placed on either receiving environment for flows less than the 100-year ARI flow. As well, due to the complete containment of the 100-year ARI flow, it is expected that incremental flows above the 100-year ARI level would be significantly mitigated in comparison to pre-development conditions, although this has not been specifically quantified at this time.
20. The design of the proposed stormwater system incorporates the projected effects of climate change, employing the HIRDS v4 RCP 8.5 scenario to the 2081-2100 time horizon.
21. In response to the submission from Fire and Emergency New Zealand (**04/21**), the stormwater system will not be specifically designed to accommodate firefighting flows, in terms of the profile of potential contaminants that may be included in runoff from firefighting events. However, the volume of water produced during a firefighting event is relatively small compared to the rain storms for which the proposed wetlands are sized, which will help to dilute firefighting runoff for treatment.

22. In response to the submission from Horizons Regional Council (**04/30**), I agree that the Plan Change should include provision for private car parks and commercial roofs over 500 m² to provide specific water quality treatment in addition to the proposed treatment wetlands, which reflects the servicing strategy described in Council's Three Waters Infrastructure Plan.

Theme #3 – rainwater tanks

23. Some submitters have identified concerns with draft provisions around the manner in which rainwater tanks are accommodated in the Plan Change. These concerns include the activity status of properties that do not incorporate a rainwater tank, requirement of rainwater tanks for joined dwellings, flexibility on the minimum size and configuration of the tanks, and one submitter who disputes that detailed requirements for rainwater tanks should be excluded from the Plan Change and instead placed in Council's Engineering Standards. Refer submissions **04/06 Elisabeth Leighfield, 04/25 Horowhenua District Council, 04/30 Horizons Regional Council, 04/32 Leith Consulting** and **04/33 Truebridge Associates** in particular.
24. I agree with the majority of submissions in that clearer provisions around rainwater tanks are recommended for the Plan Change, including an elevated status (i.e., more restrictive than a permitted activity status) for properties without rainwater tanks, flexibility on shape and size of the rainwater tanks in that no maximum size should be specified, and clearer requirements for multiple joined dwellings. A restricted discretionary status is expected to be suitable for a property to be excluded from rainwater tank requirements.
25. I disagree with the submission (**04/33**) requesting that detailed requirements for rainwater tanks should not be included in the Plan Change provisions and instead should be incorporated into Council's Engineering Standards. Currently, rainwater tanks are not required for new developments across the entire District, only for Tara-Ika, which makes the Tara-Ika chapter of the District Plan the most appropriate location for these requirements and standards. As well, this provides certainty for Tara-Ika developers in what solutions will be acceptable as they prepare their development plans. In the event that wider adoption of rainwater tanks occurs in the District, Engineering Standards can be updated with appropriate criteria which may be different than those established for Tara-Ika; in this situation the District Plan requirement could be crafted to have precedence over the Engineering Standards, again providing consistency and assurance for Tara-Ika developers in the event that standards shift in the future.

Theme #4 – integration with and impacts of Ō2NL

26. Some submitters have expressed concern with the level of demonstrated integration with Waka Kotahi and the proposed Ō2NL corridor through the western edge of the Tara-Ika Plan Change area. Refer submissions **04/22 Gill Morgan** and **04/34 WKNZTA** in particular.

27. This evidence report and attached Stormwater Assessment describe the evolution of stormwater management approach for Tara-Ika, much of which has been in the context of establishing an effective and efficient collaborative solution with Waka Kotahi. The Council and Waka Kotahi design teams engage in regular correspondence and data sharing to drive a mutually beneficial shared solution forward.
28. It is noted that the Ō2NL corridor is still in the pre-notification planning phase and many details of how the expressway will be serviced for stormwater remain highly conceptual, which has resulted in few concrete details on how the stormwater systems for Tara-Ika and Ō2NL will be integrated. Council is committed to continuing to work closely with Waka Kotahi on a shared stormwater solution; however, the stormwater servicing solutions presented in this evidence report and attached Stormwater Assessment are not dependent on Ō2NL to be feasible.

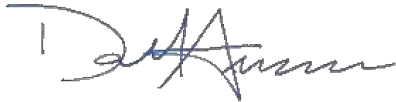
Theme #5 – alignment with Horizons Regional Council One Plan

29. Horizons Regional Council has identified several components of the Tara-Ika Plan Change that are expected to require alignment with the provisions of the One Plan, including natural hazards (flooding), existing waterways and the quality and quantity of stormwater discharge. Refer submission **04/30 Horizons Regional Council**.
30. Council is committed to obtaining required resource consents under the One Plan as applicable to enabling core infrastructure that forms part of Council's programme of works. In particular, it is Council's preference, as discussed in this evidence report, to pursue a centralised stormwater management strategy and obtain global consents around stormwater for the Tara-Ika development area, as needed. It is my opinion that this approach will lead to the best outcomes for Council, Horizons Regional Council, Tara-Ika landowners and developers, through expediting development review processes for stormwater infrastructure and ensuring high-quality stormwater mitigation is implemented.

8. CONCLUSION

31. I was commissioned by Council to assist with the development of a stormwater management servicing strategy for the Tara-Ika Growth Area in support of the Plan Change process. The strategy presented in this report and attached Stormwater Assessment provides a solution to mitigate risks to downstream sensitive environments, namely Lake Horowhenua and Koputaroa Stream, to integrate with the proposed Ō2NL expressway, and to expedite the enabling of development for landowners through Council-led stormwater management facilities.
32. In response to concerns raised by submitters, the following changes are recommended to be incorporated into the Plan Change where appropriate:

- a. Provision for private carparks and commercial roofs over 500 m² to provide specific water quality treatment in addition to the proposed treatment wetlands.
- b. Clearer requirements around rainwater tanks, including restricted discretionary status for properties without rainwater tanks, flexibility on shape and size of the rainwater tanks in that no maximum size should be specified (only a minimum size), and clearer requirements for multiple joined dwellings.
- c. Clear direction around the preferred centralised stormwater approach through treatment wetlands and soakage basins that service the entire growth area.

A handwritten signature in blue ink, appearing to read 'D. Arseneau', with a stylized flourish at the end.

David Christopher Arseneau

10 October 2021

Appendix 11: Integrated Traffic Assessment Report

mahana, nelson
027-284-0332
tim@tktpl.co.nz
www.tktpl.co.nz

tim kelly transportation planning limited

Horowhenua District Plan Proposed Plan Change 4 (Tara-Ika) Integrated Transportation Assessment

prepared by: **Tim Kelly Transportation Planning Ltd**

for: **Horowhenua District Council**

September 2021

Reference: taraika pc4 ita v5 sep21.docx



Horowhenua 
DISTRICT COUNCIL

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1 Background & Scope

1.1 Background

The Horowhenua District Council (**HDC**) proposes to rezone an area of land to the east of Levin to facilitate higher density residential development.

Proposed Plan Change 4 (**PPC4**) applies to the Tara-Ika Development Area, a 420 Ha area of land bounded by State Highway (**SH57**), Queen Street, Gladstone Road and Tararua Road. The land is currently zoned Greenbelt Residential (deferred) by the Horowhenua District Plan (**HDP**). PPC4 seeks to rezone this as residential / urban, with an expectation that this would provide for at least 2,500 dwellings in addition to commercial activities and a primary school. A Masterplan has been developed as an indicative framework for the development.

PPC4 was notified in November 2020, with submissions and further submissions made in February / March 2021. A hearing is currently scheduled for late 2021.

PPC4 is being promoted in liaison with the Waka Kotahi - NZ Transport Agency (**WK-NZTA**), which is currently developing plans for the Ōtaki to North of Levin (**Ō2NL**) state highway upgrade project. This project is likely to involve an off-line upgrade of SH57 to the east of its current alignment through the Tara-Ika area, although this remains subject to the process required to secure the necessary designation.

Development on the scale proposed by PPC4 will generate a significant level of transportation demand, mostly in the form of vehicular traffic but also cycle / pedestrian activity and potential demand for public transport services.

1.2 Scope

The purpose of this Integrated Transportation Assessment (**ITA**) is to assess the PPC4 proposals in the context of potential effects upon both the existing and future transportation network in this area. As the hearing and decisions process for PPC4 precedes the designation process for the Ō2NL project, consideration is required of scenarios in which PPC4 becomes operative both without and with the Ō2NL upgrade in place.

Section 2 of this document describes the existing transportation environment and **Section 3** describes how this is expected to change irrespective of PPC4. **Section 4** summarises the relevant provisions of PPC4. **Section 5** describes and comments upon the relevant aspects of the associated Masterplan and Structure Plan. **Section 6** identifies the potential effects of PPC4 in terms of transportation demand, traffic generation / distribution and the operation of the area network for scenarios with and without the Ō2NL project in place. **Section 7** responds to transportation issues raised in submissions made in relation to the PPC4 application. Finally **Section 8** gives the conclusions and recommendations of this assessment.

2 Existing Transportation Environment

This section describes the existing transportation environment within the geographic area expected to be affected by PPC4.

2.1 Location

The location of the Tara-Ika Development Area is shown by **Figure 2.1**. This is located approximately 2.5kms to the east of the Levin commercial centre.

2.2 Road Environment

State Highway 57

SH57 (Arapaepae Road) is an important strategic route which connects State Highway 1 (**SH1**) to the south with Shannon, Tokomaru and the southern side of Palmerston North. This forms the western boundary of the PPC4 area.

Within a road reserve of 20m, SH57 provides two traffic lanes with sealed shoulders and mostly grassed verges. The alignment is both straight and level, providing for excellent sightlines in both directions. A number of well-spaced crossings provide access to adjacent rural properties. Power cables run on poles along the eastern side of the road. The applicable speed limit is 100km/hr (this is currently subject to review, as described in **Section 3**).

The intersection with Tararua Road is priority-controlled with the side road movements subject to 'stop' controls. The Tararua Road approaches are slight offset with median islands to deter through movements at speed. No ancillary lane is provided for right turn movements from SH57 into either of the side roads.

An intersection with Meadowvale Drive is located 1.6kms to the north of Tararua Road. This is priority-controlled, with the side road movements subject to a 'stop' control. Ancillary lanes provide for the right-turn entry movement from the north and to enable right-turn exit movements to merge with the southbound traffic stream.

The Queen Street East intersection has recently been reconstructed as a roundabout (this was previously a priority intersection).

Street lighting is provided at each of the intersections described above. As a rural area, there are no footpaths or cycle lanes along this section of SH57.

Tararua Road

Tararua Road connects the southern end of the Levin urban area with a rural catchment at the base of the Tararua hills.

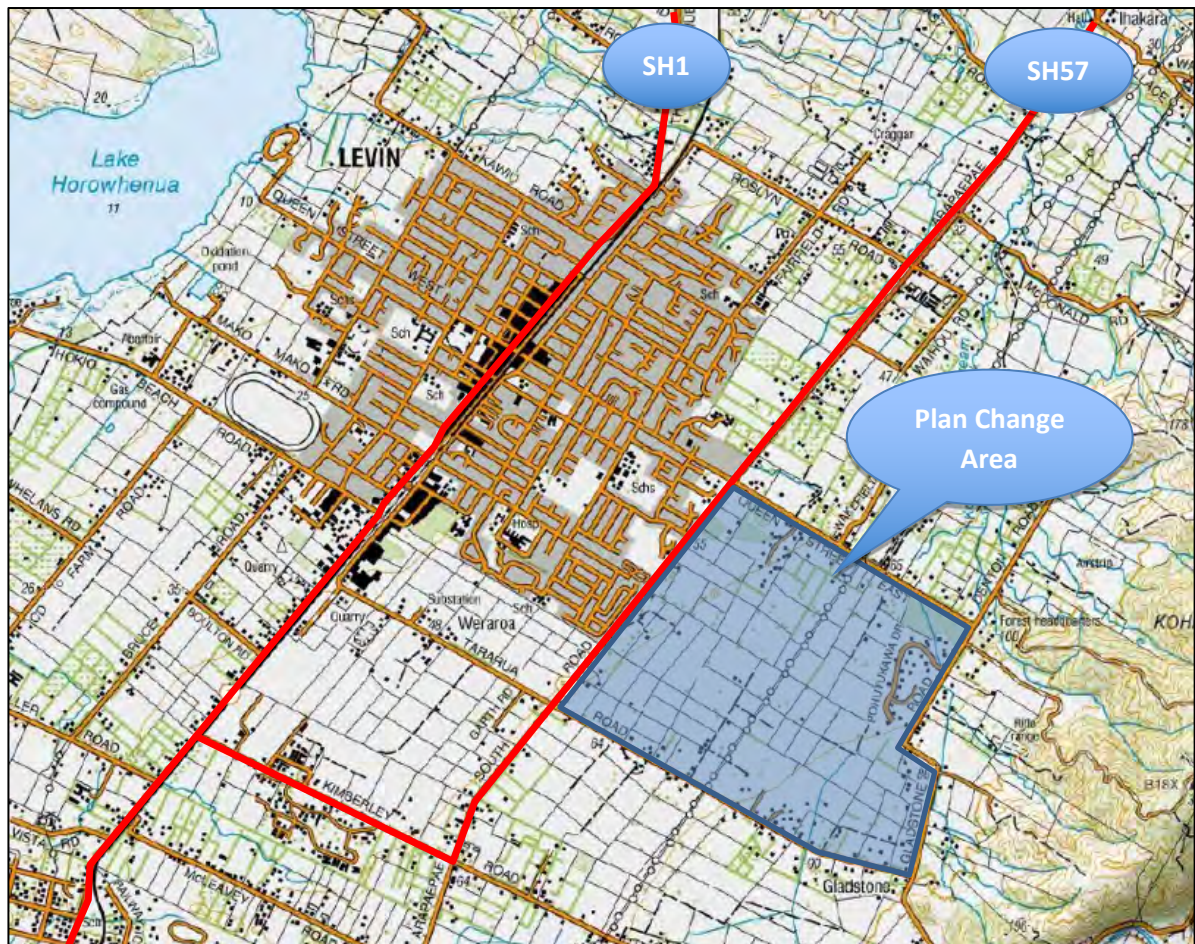


Figure 2.1: Location Plan (Source: Tumonz)

The section of Tararua Road to the north-west of SH57 services primarily rural properties at its eastern end and has a speed limit of 80km/hr. Further to the north-west, frontage activities become more commercial in nature and the speed limit drops to 50km/hr. Tararua Road connects to SH1 by means of Cambridge Street and a crossing of the railway. With the exception of a sharp bend connecting to Cambridge Street, the road alignment is straight and level with two traffic lanes having a seal width of 6 – 6.5m and no shoulders.

To the south-east of SH57, Tararua Road continues to the same standard within a 20m road reserve. Edge lines delineate the carriageway and an 80km/hr speed limit applies.

The intersection with Gladstone Road is priority-controlled with movements from Tararua Road required to give-way.

Queen Street East

Queen Street East is the most direct route between central Levin and SH57. To the north-west of SH57 this is urban in character, providing two wide traffic lanes, footpaths, kerbside parking and grassed verges within a 28m road reserve. The applicable speed limit is 50km/hr.

To the south-east of SH57, the road is rural in character with two traffic lanes. A shared foot/cycle path runs along the northern side of the road. The applicable speed limit is 80km/hr.

Gladstone Road

Gladstone Road is rural in character and provides access to rural lifestyle properties. This provides a single carriageway 5.5-6m wide with grassed verges but no footpaths.

Other Roads

Meadowvale Road provides access to an urban residential area with footpaths to both sides and a 50km/hr speed limit.

Redwood Lane, Pohutakawa Drive, Pukematawai Lane and Arete Lane provide access to areas of rural residential development within the PPC4 area from Queen Street East, Gladstone Road and Tararua Road.

Liverpool Street connects urban residential areas on the south-east side of Levin with the town centre.

2.3 Traffic Volumes & Rates of Growth

Table 2.1 summarises traffic volumes for the key roads in this area.

Road Section	ADT		Peak		Source
	veh/day	%HV	veh/hr	% HV	
SH57 (Kimberley Road)	5,190 (2019)	18%			WK-NZTA, observed
Queen Street E (W of SH57)	5,450 (2016)	5%	440-540	2-3%	Counts for model validation (2018) & HDC RAMM Counts
Queen Street E (E of SH57)	950 (2012)	0%	160-180		
SH57 (N of Queen St E)			680-850		Counts for model validation (2018)
SH57 (S of Queen St E)			470-580		
SH1 Oxford St (Queen-Bath)			820-1100		
SH1 Oxford St (Stanley – Exeter)	13,100 (2020)	9%			WK-NZTA, observed
Tararua Road (W of SH57)	1,370 (2021)	23%			HDC RAMM Counts
Tararua Road (E of SH57)	400 (2016)	46%			
Gladstone Road (Tararua Rd – Queen St)	280 (2016)	8%			
Meadowvale Drive	1,020 (2016)	0%			

TABLE 2.1: SUMMARY TRAFFIC COUNTS

The strategic importance of SH57 is evident both in the total volume of traffic carried and also the proportion of heavy vehicles.

Figure 2.2 summarises the growth in traffic volumes on SH57 in the period 2000 – 2019. While the trend growth has been 1% per annum over this period, growth in the period since 2012 has been more significant, at around 2.7% per annum.

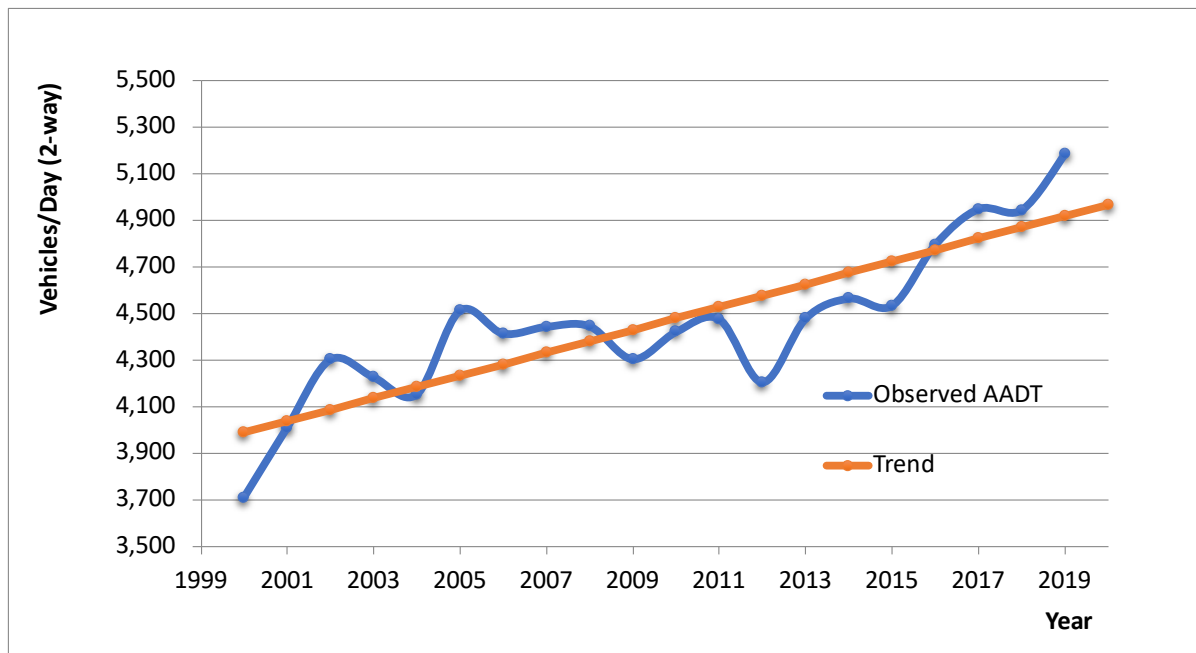


Figure 2.2: SH57 Volumes 2000 – 2019 (Source: WK-NZTA)

AADT = Annual Average Daily Traffic

2.4 Crash History

The crash history for the area in the vicinity of the Plan Change for the period since January 2016 has been obtained from the database maintained by WK-NZTA and is summarised by **Figure 2.3**.

This shows that a total of 23¹ incidents have occurred within the immediate SH57 corridor. Of these:

- 14 have occurred in the vicinity of the Queen Street East intersection (with three serious and 24 minor casualties), primarily due to a failure to give-way (this crash history does not reflect the recent upgrade of this intersection to a roundabout);
- five have occurred in the vicinity of the Meadowvale Drive intersection (with two minor casualties) – two incidents involved a failure to give-way with the remainder being a result of a loss of control and/or excessive speed; and
- four have occurred in the vicinity of the Tararua Road intersection (with one fatality and two minor casualties) – only one involved a turning / crossing manoeuvre at the intersection with the others being head-on or rear-end collisions.

WK-NZTA is implementing a package of measures to improve safety in the SH57 corridor. This is described in **Section 3.2**.

A further seven incidents have occurred in the rural area to the east of SH57. These have occurred for a variety of reasons with two serious and three minor casualties.

¹ Figure 2.2 incorrectly shows an incident on SH57 to the north of the Tararua Road intersection which actually occurred on Perth Street.

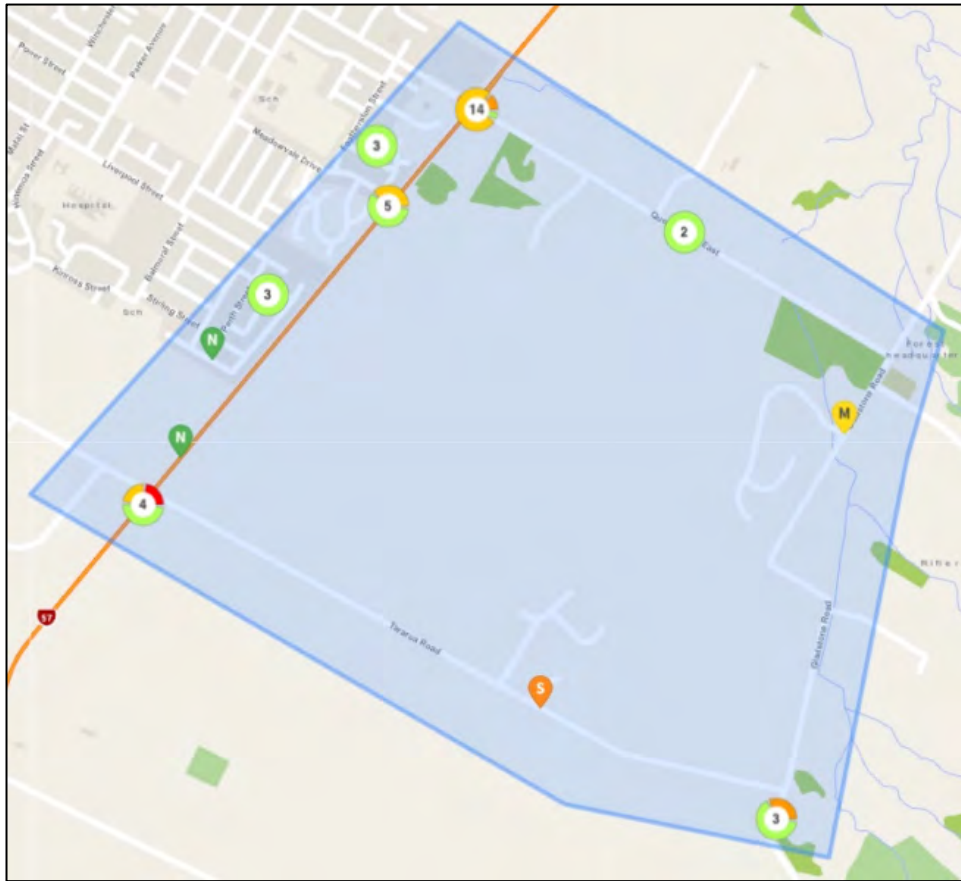


Figure 2.3: Recorded Crashes (from 2016) (Source: WK-NZTA)

2.5 Walking, Cycling and Public Transport

With exception of the shared foot/cycle path along the northern side of Queen Street East, there are no pedestrian or cycling facilities in the area to the east of SH57. Likewise, Tararua Road to the west of SH57 provides no such facilities.

In contrast, Queen Street East (west of SH57), Meadowvale Drive and Liverpool Street all provide footpaths to both sides (which connect to central Levin). While specific cycle lanes are not provided, the wide carriageways enable cycle movements to be accommodated.

No bus services operate in the vicinity of the PPC4 area, or within the Levin urban area. Longer distances services operate between Levin and Palmerston North, Levin and Waikanae and between Auckland and Wellington along SH1.

3 Do-Minimum Transportation Environment

This section describes the future transportation environment assuming that PPC4 was not to become operative. This provides a 'Do-Minimum' scenario against which the effects of the changes to patterns and volumes of transportation demand arising from PPC4 can then be assessed.

3.1 Land-Use

Tara-Ika Area

Without PPC4, the existing district plan controls upon development within the Tara-Ika area would be applicable.

The area is zoned as 'Greenbelt Residential Deferred', enabling residential development with a minimum lot size of 2,000m² (where reticulated sewerage is available) or 5,000m² where on-site sewage treatment is required. The deferred status was applied as the required infrastructure was not in place. The trigger for uplifting the deferral is the passing of a Council resolution to the effect that adequate capacity is available within the reticulated infrastructure to service the area.

It is understood that the necessary infrastructure is currently being installed with a likelihood that, subject to a Council resolution, the deferred status will be able to be lifted shortly.

While development would be subject to a range of factors, it has been assumed that without PPC4, the Tara-Ika area would provide for up to 1,240 dwellings (with the construction of Ō2NL) or 1,480 dwellings (without Ō2NL, as more land would be available).

A traffic model has been developed by consultants Stantec on behalf of WK-NZTA, primarily for the purpose of assessing the effects of the Ō2NL project. This model has also been used to assess the effects of traffic activity associated with the Tara-Ika area.

Traffic modelling has adopted low, medium and high growth scenarios² in order to address uncertainty in rates of district-wide growth. These scenarios represent 25th, 75th and 95th percentile positions on the overall district population projections, as prepared by Sense Partners. **Table 3.1** summarises the extent of development assumed within the Tara-Ika area under each of these growth scenarios, without PPC4 in place.

Growth Scenario	Assessment Year		
	2029	2039	2049
Low (25 th percentile)	16% (194-231)	22% (272-324)	24% (298-356)
Medium (75 th percentile)	50% (620-740)	100% (1,240-1,480)	100% (1,240-1,480)
High (95 th percentile)	50% (620-740)	100% (1,240-1,480)	100% (1,240-1,480)

TABLE 3.1: DEVELOPMENT GROWTH RATES

(% of full development complete by year, number of dwellings)

² Horowhenua Socio-Economic Projections: Summary and Methods: Projections Update Report. Sense Partners, May 2020 (reproduced as Appendix 10 to the s32 report).

Anticipated Development Under Existing Zoning

For the purposes of traffic modelling, it has been assumed that development will take place generally in accordance with the existing zone provisions. This includes industrial / commercial development on the northern side of Tararua Road to the north-west of the SH57 intersection.

'Aspirational' Development

An area on the southern side of Tararua Road is currently zoned 'Rural' but has been identified as a growth area in the Horowhenua Growth Strategy 2040. It is likely that this will be the subject of a future plan change to facilitate further residential development in the future. The traffic modelling has assumed development in this area in later years, based upon an expectation that the necessary plan change would be secured. The uncertainty in this process has been taken into account in the interpretation of the model forecasts and assessed effects reported in **Section 5**.

3.2 Roading Upgrades

SH57 Safety Improvements

WK-NZTA has undertaken a review of the safety of SH57 between the SH1 intersection and Heatherlea East Road (3.5kms to the north-east of the Queen Street East intersection). The following package of safety improvements is proposed:

- construction of a roundabout at the SH57 / Queen Street intersection (now complete);
- installation of edge barriers;
- widening of centrelines;
- widening of road carriageway; and
- review of speed limits.

A contract for the works has been awarded and it is anticipated that the works will be substantially complete by the end of 2021.

An upgrade of the SH57 / Tararua Road intersection to a roundabout is not an identified component of the SH57 safety improvement package. Nonetheless, this is currently being advanced with detailed design work and support from WK-NZTA to purchase the necessary land and procure construction. Accordingly, this upgrade has been assumed to form part of the Do-Minimum environment.

Speed Limit Review

WK-NZTA has recently (30 August 2021) initiated consultation on a proposal to lower the speed limit along the section of SH57 between the SH1 intersection and Shannon to 80km/hr. The submission period closes on 27 September 2021.

Ōtaki to North of Levin (Ō2NL) Expressway

WK-NZTA is proposing to construct a new highway for regional and through traffic to replace the existing SH1 between Taylors Road (north of Ōtaki) and a point to the north of Levin.

This 24km route will run to the east of the existing SH1, bypassing the existing Levin commercial centre.

The preferred alignment was announced in March 2021 following technical assessments and a consultation process.

The preferred alignment is shown by **Figure 3.1**. In the vicinity of the PPC4 area, this runs to the east of SH57 through the PPC4 area and will involve a grade-separated 'diamond' interchange (with north and south facing ramps) at Tararua Road. No intersection will be provided at Queen Street (East), which will pass over the expressway on an overbridge. The Ō2NL project includes an upgrade of the SH1 / Tararua Road intersection and railway crossing.

WK-NZTA expects to lodge a Notice of Requirement (**NoR**) to secure the necessary designation for the expressway in late 2022, with the project expected to be open to traffic in 2029. As this remains subject to the designation process and funding approvals, the associated uncertainty has been acknowledged with the PPC4 effects being considered for scenarios both without and with the Ō2NL project in place.

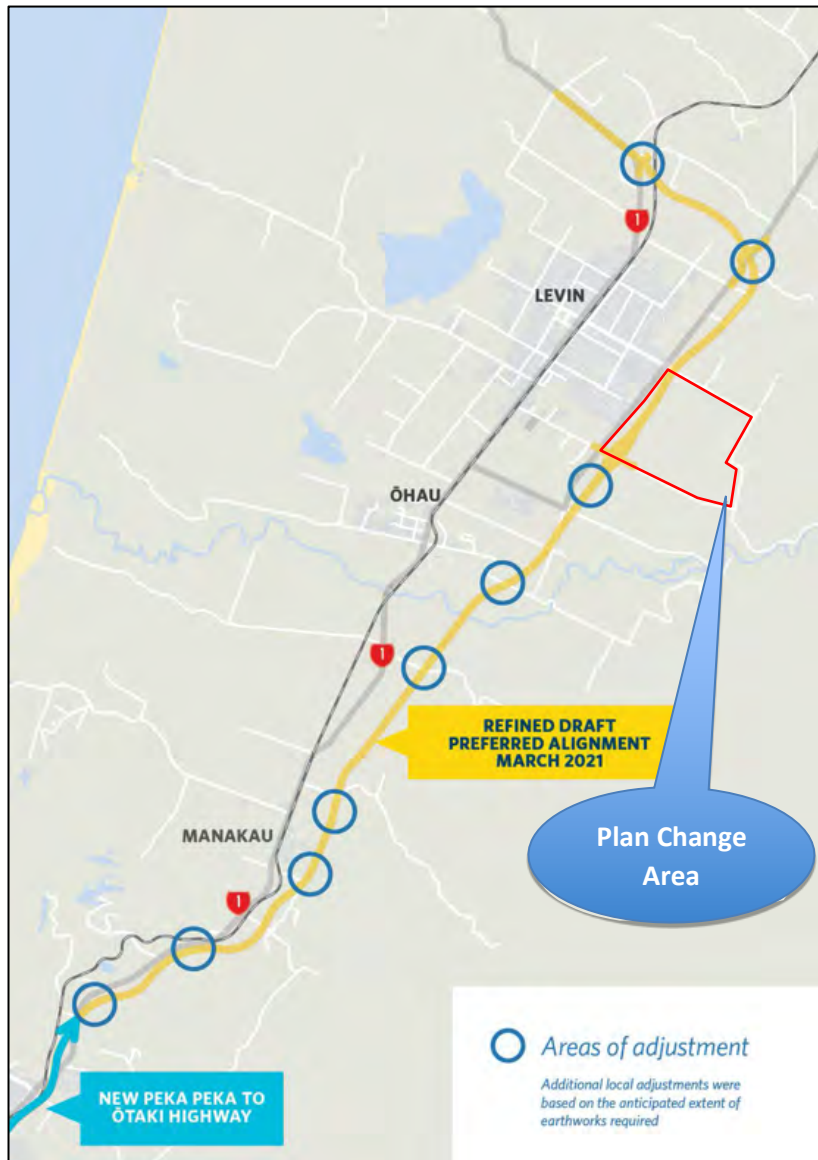


Figure 3.1: Proposed Ō2NL Upgrade Alignment

(Source: WK-NZTA)

Forecasts for the Ō2NL project³ indicate that this would carry 1,360 – 1,900 vehicles/hour in the 2039 peak periods in the vicinity of Tara-Ika. The parallel section of SH57 would experience reductions of around 80% (650 – 900 vehs/hr) to the south of Tararua Road, 50-60% (570 – 750 vehs/hr) between the Tararua Road and Queen Street East intersections, and 63% (750 – 870 vehs/hr) to the north of Queen Street East.

Queen Street East would experience traffic reductions of up to 12% (0 – 110 vehs/hr) and 15% (80 – 110 vehs/hr) to the west and east of SH57 respectively. Volumes using Tararua Road would increase significantly, by 55-78% (440 – 490 vehs/hr) to the west of SH57 and 65-96% (600 – 710 vehs/hr) to the east.

For SH1 through central Levin, traffic volumes would reduce by between 18 and 37% (320 – 580 vehs/hr).

³ Based upon model forecasts supplied for the 2039 medium growth scenario.

4 Proposed Plan Change

This section describes the relevant provisions of PPC4 insofar as these affect the potential quantum and pattern of future transportation demand.

4.1 Masterplan Principles

The Tara-Ika Masterplan is described as a comprehensive blueprint for residential growth in Tara-Ika, which defines the location of key roads and pedestrian/cycle connections.

The Masterplan provides the context for the district plan rules and a Structure Plan which are proposed for this area. Key transportation-related objectives, the associated design principles and actions are summarised below (a more detailed critique of the details of the Masterplan is presented in **Section 5**).

Connectivity

Objective: ensuring a high level of internal and external connectivity for good local access and multi-modal movement.

For internal connections, the design principles and actions are:

- A logical and coherent interconnected network of streets and movements links, to be achieved by:
 - short street blocks;
 - a deformed grid layout; and
 - minimal use of cul-de-sacs.

For external connections, the design principles and actions are:

- Roading connections to all areas in Tara-Ika, Levin, and to future urban growth areas
 - high quality roads, walking and cycle routes that connect to the existing Levin urban area and routes;
 - accessible links to existing open space networks;
 - connections to existing paths and cycle lanes;
 - intersections designed for the safety of vehicles, pedestrians and cyclists; and
 - connections to existing rural-residential streets where possible.
- Integration with Ō2NL alignment
 - multiple connections across the expressway
- Integration with Arapaepae Road (SH57)
 - safety improvements at the Queen Street / SH57 intersection;
 - key connections across SH57; and
 - intersections that provide for safety of vehicles, pedestrians and cyclists.
- Plan for public transport in the future

- a hierarchical system of interconnected streets with sufficient width to allow for an efficient local public transport network.

Streets for people

Objective: ensuring a high level of internal and external connectivity for good local access and multi-modal movement.

The associated design principles and actions are:

- An environment that encourages the community's health and wellbeing, making walking and cycling safe, easy and fun.
 - cycleways along major transport routes;
 - connections to the existing and planned town-wide cycleway network;
 - quality, attractive, well-lit streetscape; and
 - street trees and planting.
- Public accessibility and Safety
 - minimal intersections and driveways on cycleways – use of rear lane access wherever appropriate; and
 - streets configured to ensure that dwellings front the street.
- Co-ordinate with the requirements for Arapaepae Road (SH57)
 - Arapaepae Road to be an urban arterial following expressway construction;
 - positive street frontage and quality streetscape along Arapaepae Road; and
 - building frontages and a streetscape treatment along Arapaepae Road to give appearance of entering a residential environment.

4.2 Tara-Ika Multi-Zone Precinct (relevant issues, objectives, policies and rules)

Proposed Zones

PPC4 would divide the Tara-Ika area into four zones:

- Commercial Zone;
- Open Space Zone;
- Residential Zone; and
- Greenbelt Zone.

For each of these zones, existing objectives, policies and rules in the district plan would be applicable (unless overridden by those for the Tara-Ika multi-zone precinct).

Issues

PPC4 recognises the following risks:

- that additional traffic could compromise the intended achievement of high amenity values within the development area;

- that the preferred corridor for the Ō2NL project could sever Tara-Ika from the existing Levin urban area; and
- that development could occur in a way which is disconnected from the urban area of Levin and associated services.

The development of the Masterplan seeks to address these risks.

PPC4 Objectives & Policies (as notified)

Objective 6A.1: to achieve an integrated and connected development that is supported by a well connected roading network that supports a range of transport modes to include safe and efficient walking and cycling options and a well connected, safe and efficient roading network.

Policy 6A.1.1: subdivision, infrastructure and land development in Tara-Ika must be consistent with Structure Plan 013.

Policy 6A.1.5: require subdivision layout to ensure street design enables the safe and efficient movement of people and traffic, provides a high level of safety and amenity for pedestrians and cyclists, and contributes positively to the public realm.

Objective 6A.2: efficient delivery of infrastructure within Tara-Ika will enable development while protecting environmental values and achieving a high level of residential amenity.

Policy 6A.2.1: make provision within Tara-Ika for a housing yield of 2,500 – 3,000 houses.

Policy 6A.2.2: require subdivision and development to be managed, designed and staged to align with the co-ordinated provision and upgrading of the infrastructure network (including road network)

Policy 6A.2.3: avoid subdivision and development that compromises the ability to provide efficient and effective infrastructure for the wider Tara-Ika area.

Objective 6A.4: achieve a high amenity, walkable residential environment with a range of section sizes and housing types, including affordable housing options, in Tara-Ika.

Policy 6A.4.1: optimise walkability by providing for higher density residential development near to commercial and community facilities and lower density residential development at the outer edges of Tara-Ika.

Rules

Proposed Rule 15A.1 states that permitted activities are as per Chapter 15 (residential zone), Chapter 18 (Greenbelt Residential zone) and Chapter 20 (Open Space zone). Rule 15A.1.2 defines the permitted activities for the Commercial Zone.

Permitted activities are subject to the following condition:

15A.6.1.1 (for all zones) Vehicle Access onto Strategic Cycleways (a) No vehicle crossings shall cross a strategic cycleway shown on Structure Plan 013 - vehicle access is to be via the rear access lanes shown on Structure Plan 013.

Proposed Rule 15A.2 states that controlled activities are as per the definitions in the 'parent' chapters of the HDP.

Proposed Rule 15A.3 states that restricted discretionary activities are as per the definitions in the 'parent' chapters of the HDP, but with a number of exceptions, including 15A.3.1(a) relating to the subdivision of land within all zones.

Rule 15A.8.1.2(a) defines the matters of discretion applicable to subdivision in the Residential Zone and includes the following relevant transportation-related matters:

- (i) Consistency with Structure Plan 013;
- (ii) Design and layout, including connectivity and linkages (both within and beyond the subdivision);
- (viii)&(ix) The provision of any new roads, cycleways, provision of linkages to existing roads, access over or under railway lines, the diversion or alteration of any existing roads, the provision of access, passing bays, parking and manoeuvring areas and any necessary easements;
- (x) The management of traffic generated and potential adverse effects on the safety and efficiency of the street network;
- (xi) Minimise use of cul-de-sacs, particularly cul-de-sacs that are long or have poor visibility to or from the street they connect to; and
- (xix) Compliance with the Council's Subdivision and Development Principles and Requirements (Version: July 2014).

Proposed Rule 15A.4 states that discretionary activities are as per the definitions in the 'parent' chapters of the HDP, but with a number of exceptions (none of which relate directly to transportation matters).

Proposed Rule 15A.5 states that non-complying activities are as per the definitions in the 'parent' chapters of the HDP, but additionally including:

15A.5.1(e) Subdivision or land use activities that are not consistent with Structure Plan 013; and

15A.5.1(g) Any activity that does not comply with Rule 15A.6.1.1 – Vehicle Access into Strategic Cycleways.

Chapter 15 states that residential activities are Permitted, subject to compliance with relevant conditions in Rule 15.6 and Chapters 21, 22, 23 and 24.

Rule 15.6 defines conditions for permitted activities, including such matters as the number of residential units per site, building heights, setbacks etc. The only transportation-related conditions require compliance with the permitted activity conditions in Chapter 21.

Chapter 21 defines standards, conditions and requirements for vehicle access, parking, loading and roading.

Chapters 22 and 23 define standards for utilities & energy and hazardous substances respectively.

Chapter 24: Subdivision & Development – requires compliance with NZS4404:2010, provision of vehicular access.

Overview

Together, the rules above ensure that subdivision and development must consider the potential effects of additional traffic movements on the road network. The design of transportation infrastructure is required to be consistent with the Structure Plan and compliant with the relevant district-wide standards, NZS4404:2010 and Council's Subdivision and Development Principles and Requirements.

5 Masterplan & Structure Plan

This section reviews the more specific details of the Masterplan and Structure Plan 013. The Masterplan has provided the underlying vision and design principles from which Structure Plan 013 has been developed. Structure Plan 013 forms part of PPC4 and would be the relevant statutory framework for the development.

5.1 Structure Plan

The Structure Plan is shown by **Figure 5.1**.

5.2 Rooding Connectivity

Structure Plan 013 identifies a hierarchy of rooding connections.

Hierarchy

Two arterial roads are proposed, with the primary function of traffic movement rather than access provision. One will connect Arapaepae Road (SH57) with Gladstone Road, running broadly NW/SE through the centre of the Tara-Ika area, with a bridge over the expressway alignment. The other will run broadly at right-angles, connecting the Queen Street East and Tararua Road frontages.

The arterial roads will be supplemented by collector roads, which will form an approximate square within the development area but including linkages to two points on each of the Queen Street East and Tararua Road frontages. The primary function of collector roads is the 'collection' of traffic movements from the minor street network.

Below the collector roads, a network of local roads and laneways will prioritise property access over through movement.

Connectivity to Arapaepae Road

Both the Masterplan and the Structure Plan indicate the possible provision of direct connectivity between a number of minor roads within the development area and Arapaepae Road. Without or prior to the opening of the Ō2NL project, the high through traffic volumes would preclude the provision of such frequent intersections. Even with the lower traffic volumes associated with the operation of Ō2NL, the form and frequency of these intersections would need to be considered carefully in the context of the wider management of safety along Arapaepae Road. This issue should be addressed as part of the assessments required to secure consent, when better information is likely to be available regarding the progression / timing of the Ō2NL project and the proposed treatment of the Arapaepae Road corridor.

Road Standards

The Masterplan identifies the intended cross-sectional standard for each road type, as shown by **Figure 5.2**.

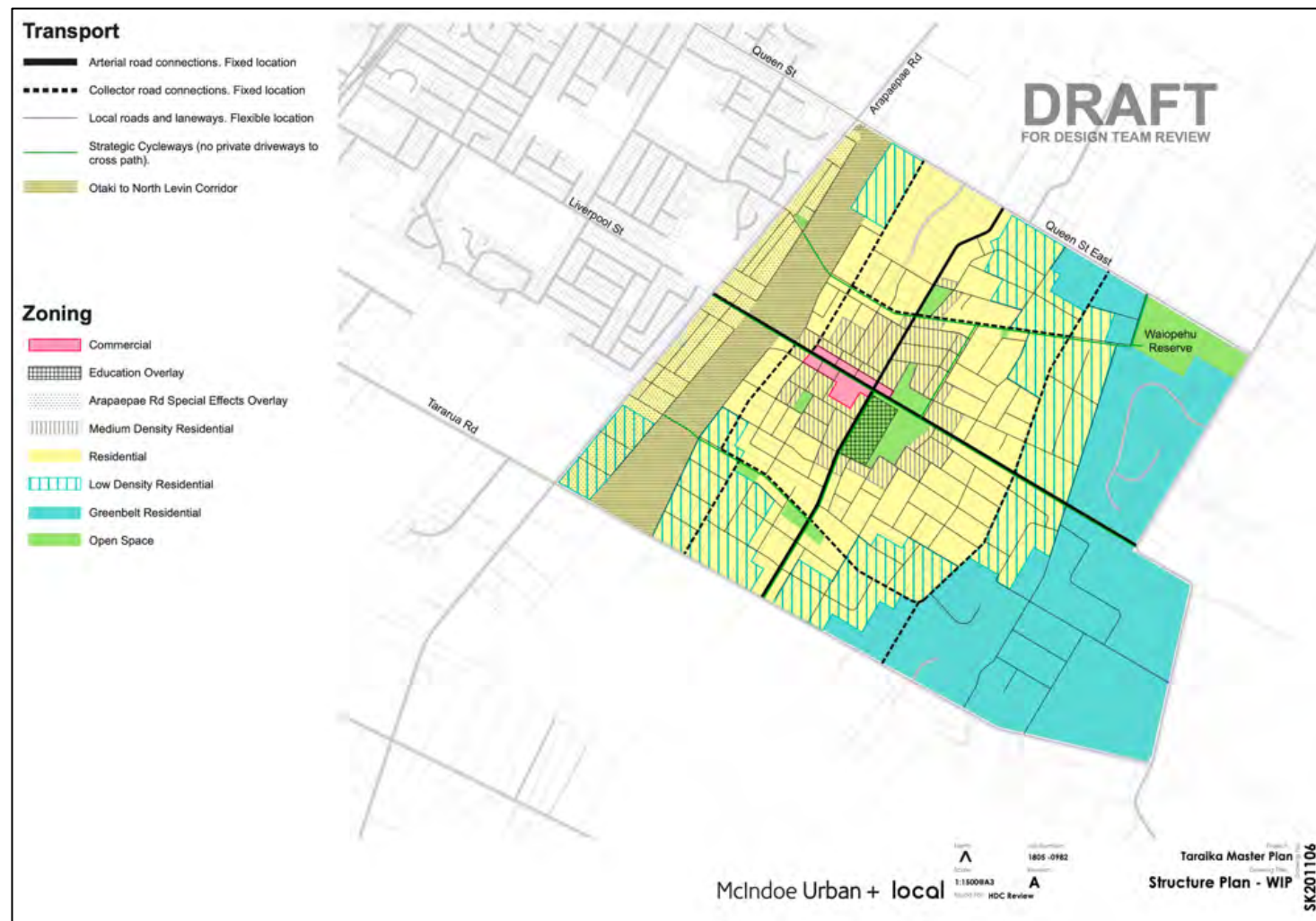


Figure 5.1: Draft Structure Plan

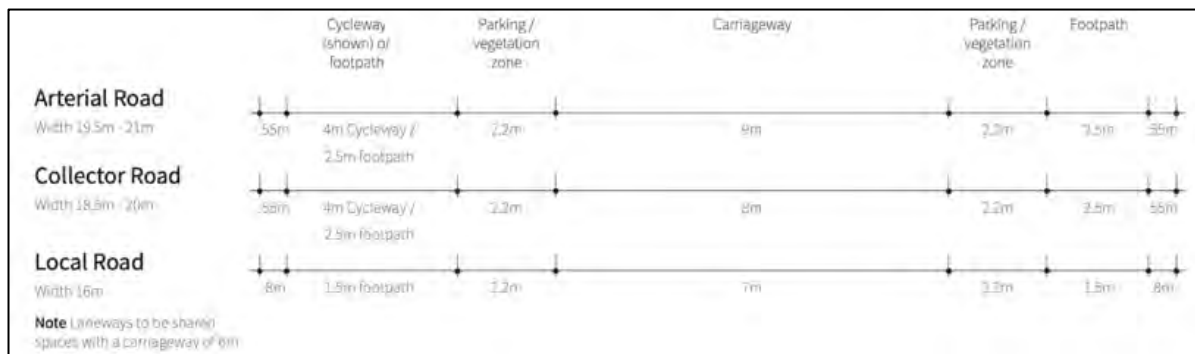


Figure 5.2: Proposed Road Cross-Sections (Source: Masterplan)

The proposed arterial and collector roads would provide for a 4m shared cycleway / footpath to one side (where a strategic cycleway is provided, otherwise a 2.5m wide footpath) with a 2.5m footpath on the other side, with two 2.2m wide parking or vegetation zones.

The proposed local roads would provide for a 1.5m footpath and 2.2m parking or vegetation zone on each side.

Comment: The proposed carriageway widths (7m, 8m and 9m respectively for arterial, collector and local roads) appear wide for roads of these types and inconsistent with the principles of NZS4404:2010. This could result in the intended speed environments not being achieved, unless accompanied with a package of traffic management measures. Carriageways could be narrowed with increased space allocated to the active modes.

Comment: the roading hierarchy should logically adopt the terminology and definitions used by the One Network Road Classification (ONRC).

5.3 Walking & Cycling connectivity

Strategic cycleways will run alongside the full length of the NW/SE arterial and the southern section of the NE/SW arterial. A cycleway will also run between the Waiopahu Reserve and Meadowvale Drive, utilising a collector route and a bridge over the expressway. Another will connect the NE/SW arterial with another bridge over the expressway. The expressway overbridge concepts and funding have yet to be agreed with WK-NZTA.

All routes will also provide for walking connectivity.

5.4 Public Transport

The road network design does not preclude the possibility of servicing by public transport in the longer-term.

6 Assessment of Effects

This section describes the potential effects associated with PPC4 in terms of the change to the pattern of development this would enable, the related changes in transportation demands, and impacts upon the operating efficiency and safety of the road network.

6.1 Potential Effects

PPC4 would not itself generate effects as specific development will remain subject to consent processes which in turn will require consideration of transportation issues.

Nonetheless, it is appropriate to consider the potential effects which could be associated with the general scale and pattern of development envisaged by PPC4. These potential effects can be categorised as those which are external or internal to the development area.

External Effects

- SH57 intersections (Queen Street East, Tararua Road, Meadowvale Drive, central spine road) – operating efficiency and safety (with or without Ō2NL upgrade) ;
- new intersections (on Queen Street East, Gladstone Road and Tararua Road) – operating efficiency and safety;
- urban road network to the west of SH57 – operating efficiency and safety (excluding any specific connection to Liverpool Street);
- the existing SH1 corridor through central Levin; and
- pedestrian, cycle and public transport connectivity between the development and urban Levin – extent to which good connectivity will enable positive effects of reduced private car dependency to be realised.

Internal Effects

- pedestrian / cycle / public transport connectivity – extent to which the Masterplan promotes connectivity to enable the positive effects of reduced private car usage to be realised; and
- road network and cross sections – extent to which the proposed internal road network is likely to operate efficiently and safely.

6.2 Methodology

Most of the potential effects identified above will be primarily associated with the changes in traffic activity on the road network in the vicinity of the PPC4 area.

As described in **Section 3.1**, a traffic model has been developed by WK-NZTA for the purposes of evaluating the Ō2NL project and this has been extended to quantify the traffic-related effects of development associated with PPC4. This uses the SATURN⁴ modelling software package and has been subject to an independent peer review process.

⁴ Simulation and Assignment of Traffic to Urban Road Networks.

The Ō2NL design and designation processes are being advanced in parallel to those associated with securing PPC4. As a designation will not be confirmed prior to consideration of PPC4, it is possible that development enabled by PPC4 proceeds with or without/prior to the Ō2NL upgrade, and that Ō2NL proceeds with or without PPC4-related development. Accordingly, a range of scenarios has been assessed to enable those effects which are associated with the Ō2NL project to be differentiated from those arising from PPC4.

Logically, more 'weight' should be given to the scenarios with the Ō2NL project in place, since this is the more likely outcome (at this stage, there do not appear to be any significant impediments to securing the designation and eventual funding). However, from a planning perspective, the Ō2NL project cannot be considered to be a part of the 'consented baseline' against which the effects of Tara-Ika are then assessed. For these reasons, scenarios both with and without the Ō2NL project have been considered to have equal relevance.

The traffic model has been run for 2029, 2039 and 2049 forecast years, with low, medium and high growth scenarios. The light and heavy vehicle types are modelled separately.

6.3 Development

The level of potential development without PPC4 is described in **Section 3.1**.

With PPC4, HDC considers that a development of 2,500 dwellings is realistic for this area, but at higher densities the number of dwellings could be at most 3,700.

As described in **Section 3.1**, modelling for 2049 has assumed that some development will also occur in an area known as 'LS7' on the southern side of Tararua Road. The zoning of this area does not currently support such development and a separate plan change would need to be secured. For this reason, this development may be regarded as 'aspirational' rather than committed. Again this may be considered to be a 'worst-case' for traffic assessment purposes.

At a wider level, the traffic modelling is based upon a premise that if development occurs within Tara-Ika as enabled by PPC4, then this would replace, rather than be in addition to, development elsewhere in the district. As a consequence, when considering the transportation-related effects of PPC4, a positive effect may be associated with reductions in traffic activity in other areas (which may not be as well connected to the strategic road network).

6.4 Traffic Demand and Network Scenarios

A range of traffic demand and network scenarios have been assessed using the traffic model. These combine the forecast years and general growth scenarios above with options for the Tara-Ika development and the Ō2NL project.

Table 6.1 summarises the extent of development assumed within these scenarios, applied to both the pattern of development with PPC4. HDC has confirmed that these growth rates are realistic.

Growth Scenario	Assessment Year		
	2029	2039	2049
Low (25 th percentile)	16% (579)	22% (811)	24% (889)
Medium (75 th percentile)	50% (1,850)	100% (3,700)	100% (3,700)
High (95 th percentile)	50% (1,850)	100% (3,700)	100% (3,700)

TABLE 6.1: DEVELOPMENT GROWTH RATES

(% of full development complete by year, number of dwellings)

6.5 Forecast Traffic Effects of PPC4

The traffic model has been used to prepare forecasts for a wide range of scenarios encompassing the different forecast horizons and growth outlooks. This assessment has focussed on results for the 2039 medium growth scenario, as this represents a reasonable outlook period which still accounts for the full development of the Tara-Ika area.

The results and analysis reported below include consideration of the effects of a connection to Liverpool Street. This has been included for information only as the formation of such a connection is not a part of the PPC4 proposal (as described below).

Traffic Volumes – Without Ō2NL

Figures 6.1 and 6.2 summarise the forecast traffic volume changes attributable to PPC4 without the Ō2NL project, for scenarios without and with a connection to Liverpool Street to the west of SH57 respectively. Figures are presented as Passenger Car Units⁵ (PCUs) per hour for each of the modelled AM, Inter and PM peak periods.

PPC4 would result in up to an additional 1,360 east-west movements to the immediate east of SH57. The majority of these additional movements would utilise the central spine road connection to SH57, but with significant increases on Queen Street East. Volumes on Tararua Road would drop, principally because development under PPC4 would channel traffic movements along the central spine road (compared to a lower density pattern of development without PPC4 which would be more reliant on the use of Tararua Road).

The effects on SH57 would be mixed, with reductions in some areas and modest increases elsewhere. Without any connection to Liverpool Street, most of the additional traffic using the central spine road would utilise Meadowvale Drive, resulting in increases along this route and along the short distance of SH57 between the Meadowvale Drive and central spine road intersections. In contrast, the provision of a connection to Liverpool Street would provide a direct route to/from the Levin central area, with volume reductions on Meadowvale Drive and SH57.

Traffic Volumes – With Ō2NL

Figures 6.3 and 6.4 summarise the corresponding forecast traffic volume changes with the Ō2NL project assumed to be in place.

⁵ A car or light vehicle is equal to one PCU, and a truck is equal to 2 PCUs.

The direction and scale of the volumes is similar to those described above, but with the base volumes using SH57 being considerably reduced as a result of the diversion of traffic to the Ō2NL project.

SH57 Intersection Performance - Effects

Changes in the forecast delays at the intersections within the SH57 corridor are generally small (and in some cases negative), indicating that the assumed single lane approach standards would be able to accommodate the changes in traffic activity associated with PPC4. The assumed roundabout with the central spine road would provide sufficient capacity, but with the introduction of additional delays of 15-20 seconds for the through movements along SH57.

Safety / Amenity - Effects

Safety and amenity effects cannot be forecast and quantified in the same manner as the traffic volumes reported above.

As described above, without any direct connection to Liverpool Street, Meadowvale Drive and a short section of SH57 could experience large increases in traffic activity. This could be detrimental to safety, especially for the increased right turn exit movement from Meadowvale Drive to SH57 (this would be less of an issue with the Ō2NL project as the background traffic volumes using SH57 would be significantly reduced).

As Meadowvale Drive does not provide a direct connection to the Levin central area, the additional traffic could lead to potential amenity and safety impacts on the local residential network including Meadowvale Drive and Bartholomew Road.

These effects would be largely removed by the provision of a more direct link using Liverpool Street. Alternatively, a package of traffic management measures could be implemented to manage speed and safety within the residential street network. Such measures would also be likely to reduce the use of these routes by extraneous traffic movements.

Levin Urban Network

The forecast volume increases on the Levin urban road network to the west of SH57 are well within the capacity of the network and would not give rise to any specific capacity issues. As noted above, the distribution of the additional traffic movements would be improved with the provision of a connection to Liverpool Street, as this road is of a high standard and provides a direct connection to the town centre.

SH1 Corridor - Effects

Figure 6.5 summarises the volume changes for three sections of SH1 through the Levin urban area:

- north (between Kawi Road and Paisley Street);
- central (between Bath Street and Queen Street West); and
- south (between Hokio Beach Road and Cambridge Street).

This indicates that the effect of PPC4 is to reduce volumes using SH1 for all locations and at all time periods. With the Ō2NL project in place, the base volumes using SH1 are lower (as a result of the diversion of through traffic to the expressway), but the effect of PPC4 is nonetheless to further reduce the volumes along SH1.

These reductions are due to the assumed redistribution of growth to the Tara-Ika area and the expressway corridor instead of other areas which would be more conveniently serviced by the existing SH1.

For context, the chart for the Bath Street – Queen Street section of SH1 includes existing (2018) volumetric information (this is the only section for which reliable count information is available). This shows that without the Ō2NL project, volumes will be increased irrespective of the pattern of development. With the Ō2NL project, volumes will be reduced. Some caution is required in any comparison of 2018 existing volumes with those forecast for 2039 as differences will be due to the effects of both general background growth and also the specific growth forecast for the area.

In summary, the pattern of development enabled by PPC4 will be beneficial for the efficiency of the SH1 corridor through central Levin, irrespective of the construction of the Ō2NL project.

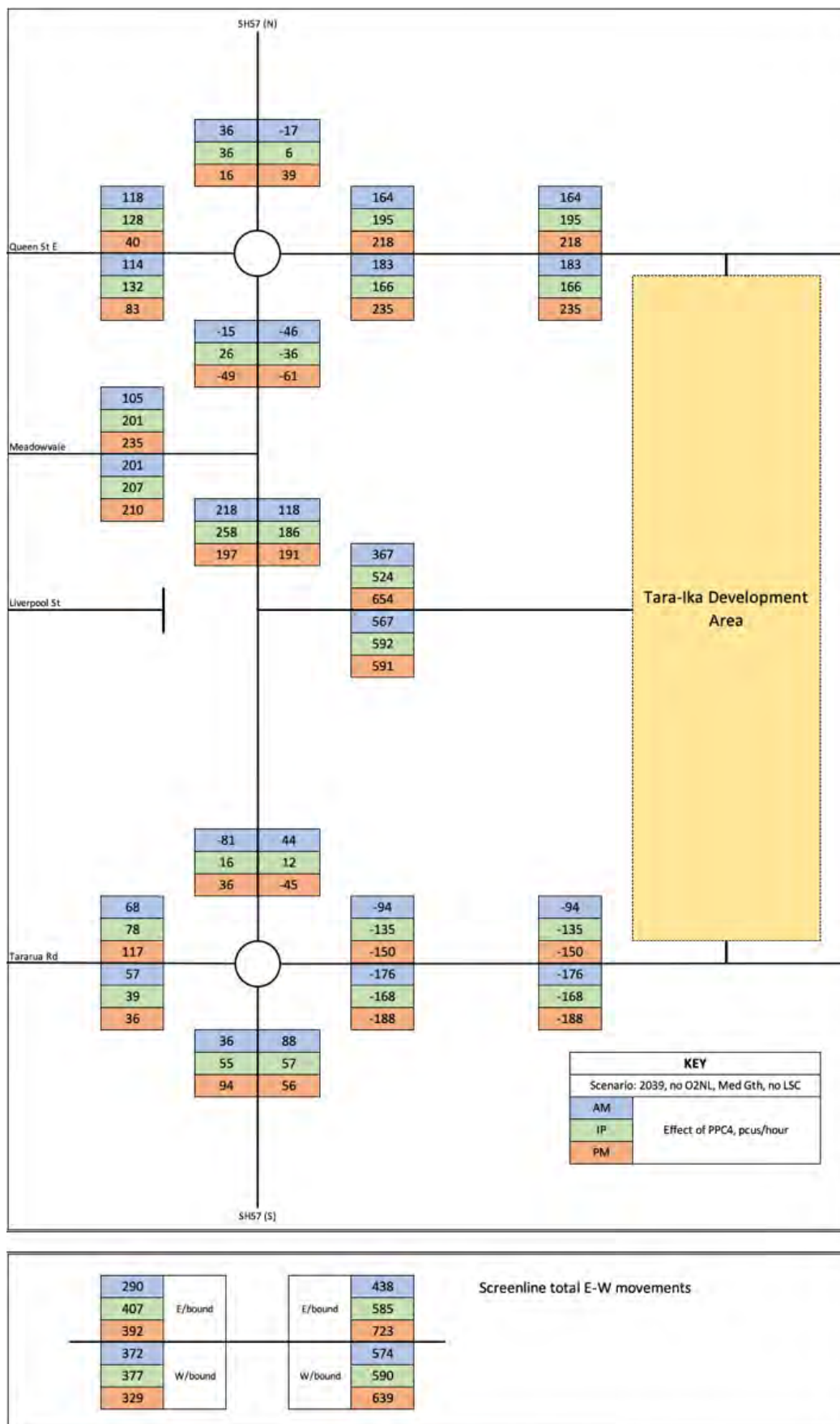


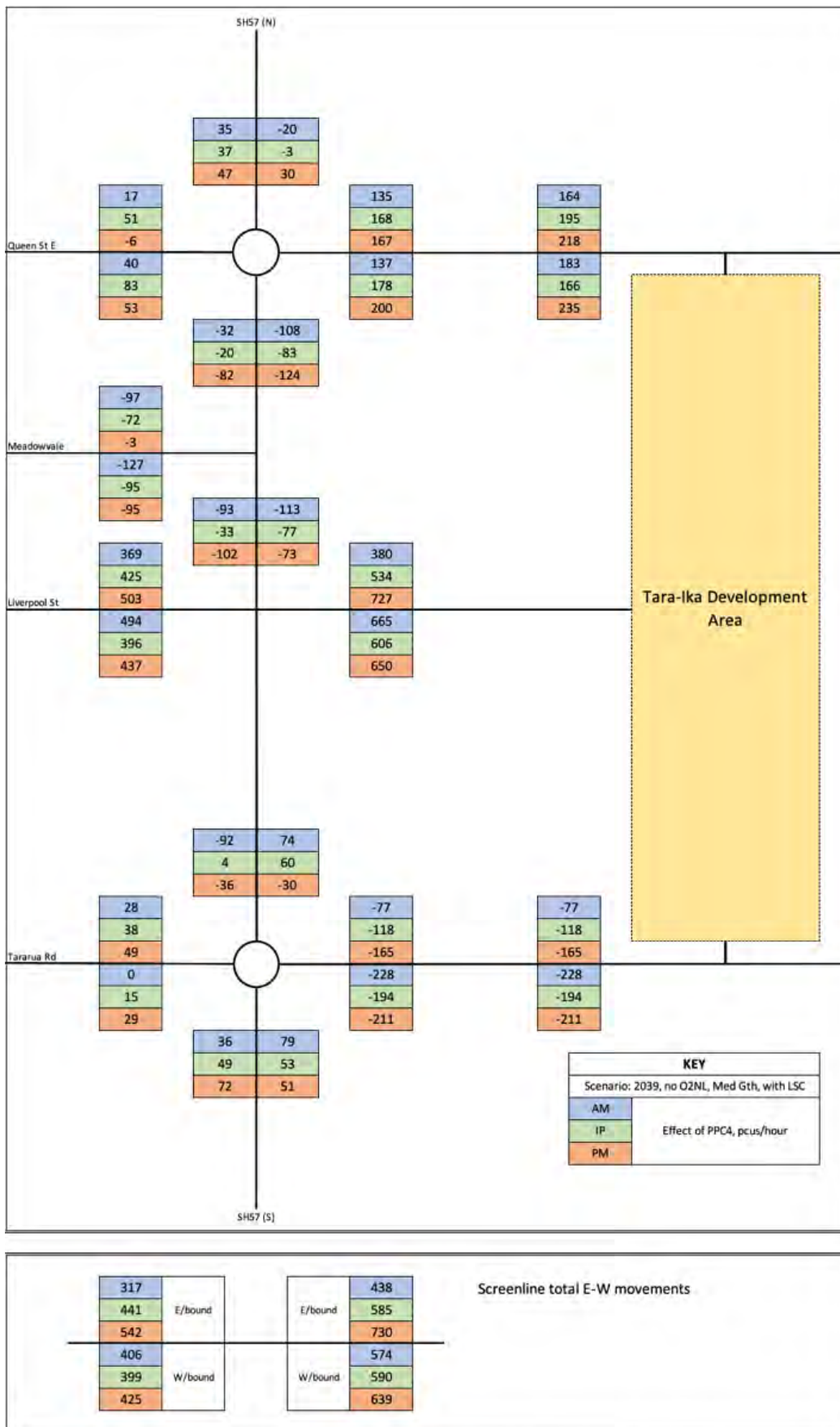
Figure 6.1: FORECAST TRAFFIC VOLUME CHANGES DUE TO PPC4, NO O2NL

2039, Medium Growth

REF: Do-Min = TD_39_xx_00d_M3 xx = AM, IP, PM

No Connection to Liverpool Street (West of SH57)

PPC4 = TD_39_xx_00d_M1

**Figure 6.2: FORECAST TRAFFIC VOLUME CHANGES DUE TO PPC4, NO O2NL**

2039, Medium Growth

REF: Do-Min = TD_39_xx_00d_M3 xx = AM, IP, PM

With Connection to Liverpool Street (West of SH57)

PPC4 = TD_39_xx_00c_M1

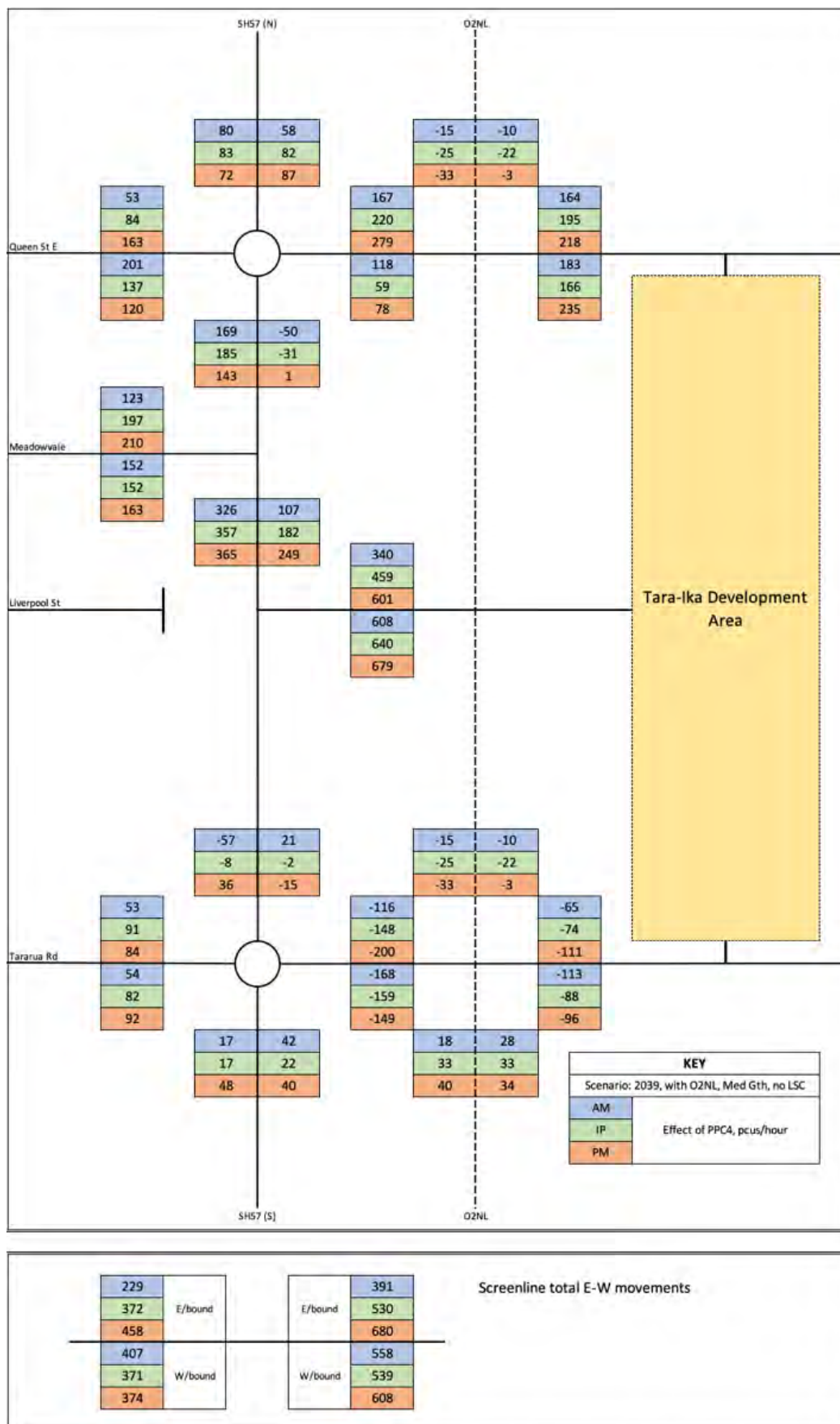


Figure 6.3: FORECAST TRAFFIC VOLUME CHANGES DUE TO PPC4, WITH O2NL

2039, Medium Growth

REF: Do-Min = TD_39_xx_01d_M2 xx = AM, IP, PM

No Connection to Liverpool Street (West of SH57)

PPC4 = TD_39_xx_01d_M1

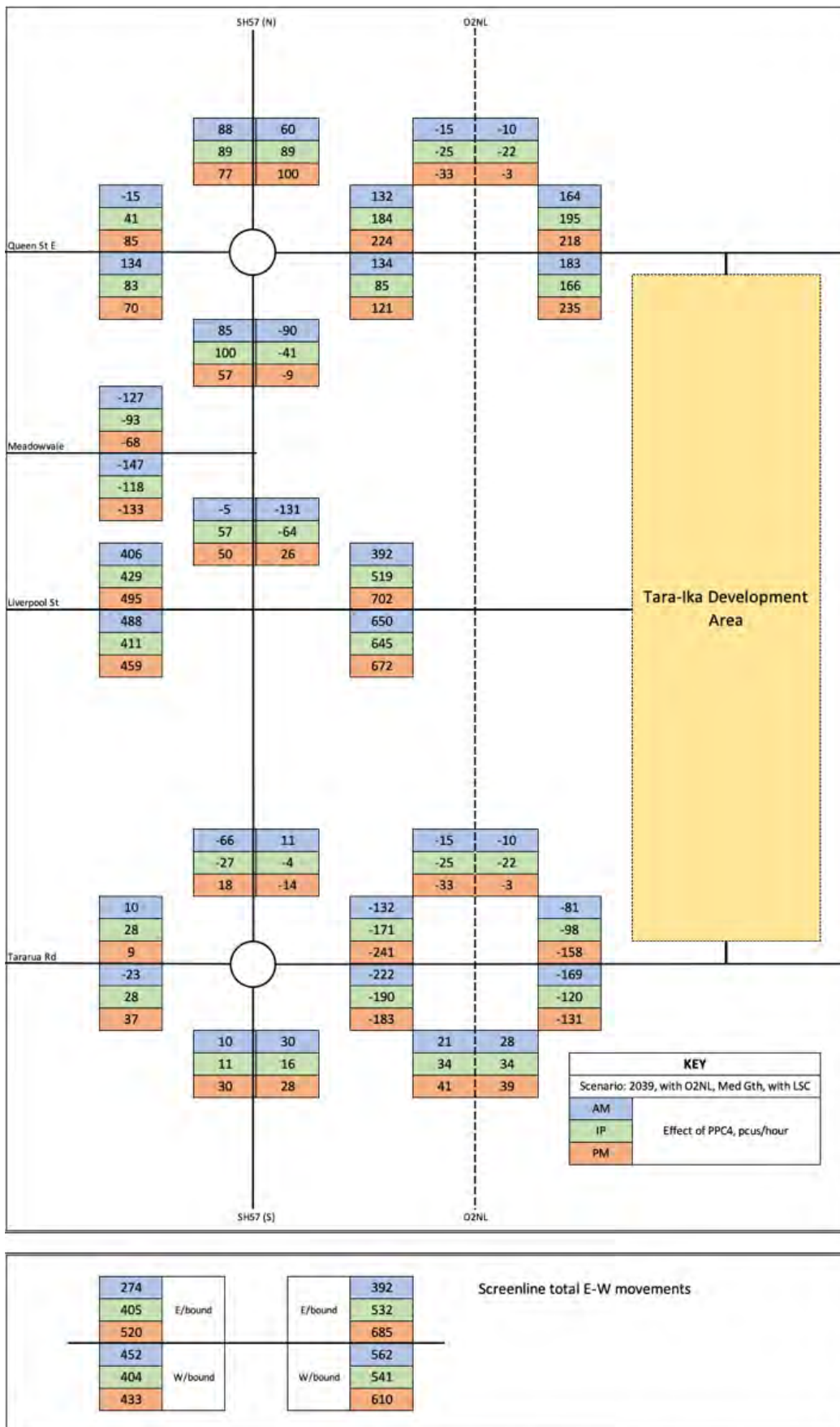


Figure 6.4: FORECAST TRAFFIC VOLUME CHANGES DUE TO PPC4, WITH O2NL

2039, Medium Growth

REF: Do-Min = TD_39_xx_01d_M2 xx = AM, IP, PM

With Connection to Liverpool Street (West of SH57)

PPC4 = TD_39_xx_01c_M1

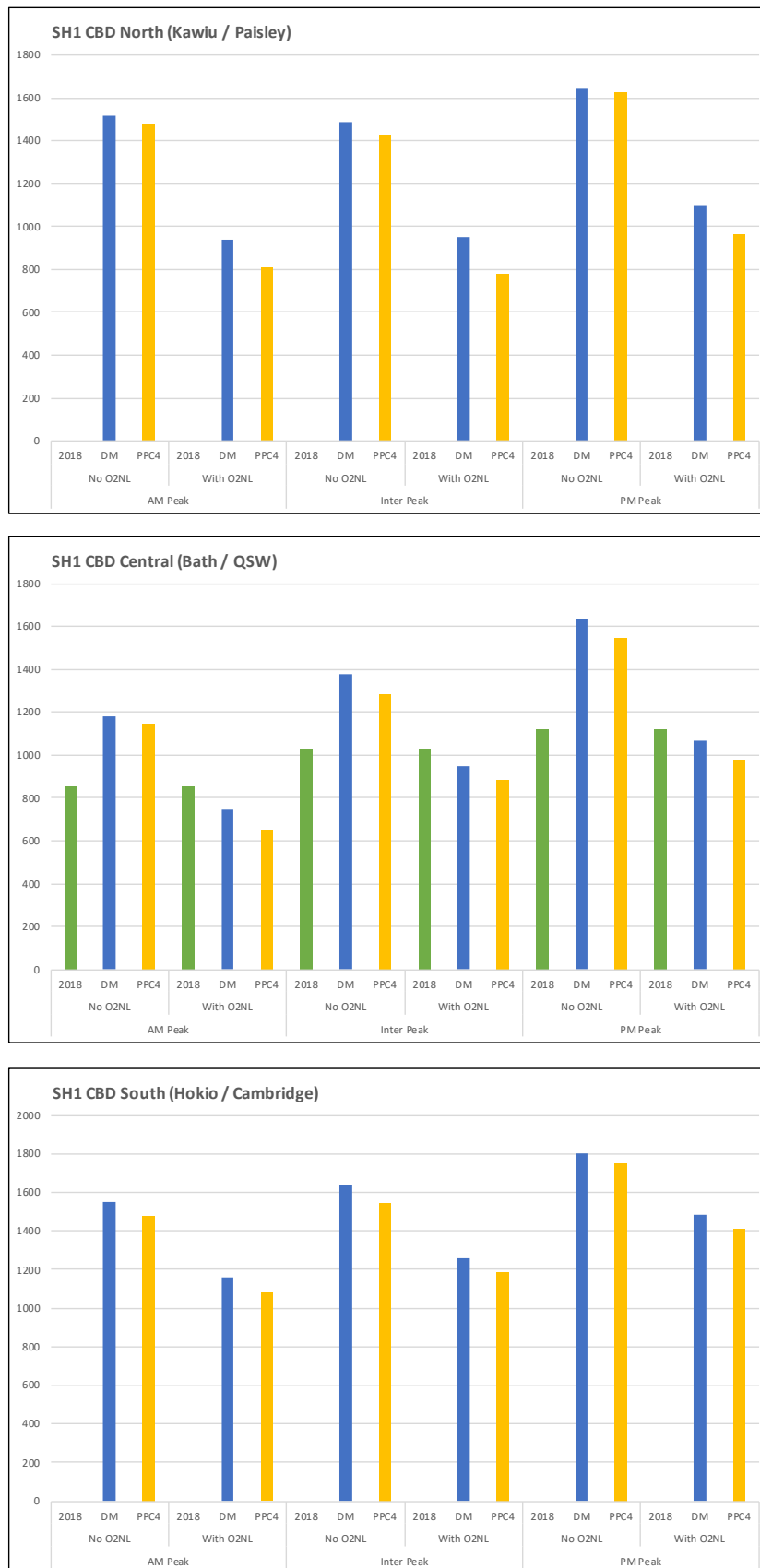


Figure 6.5: Forecast Effects Upon SH1 Traffic Volumes, Central Levin
(figures are pcus/hour, 2039)

Tara-Ika Connections to Adjacent Road Network

The provision of multiple access points to the existing road network means that intersections with Queen Street East, Tararua Road and Gladstone Road would operate well within capacity limits with negligible levels of delay.

There appear to be no impediments to the design of these intersections in a way which would ensure the achievement of safe sight lines to enable all turning movements to be made safely.

Liverpool Street & Central Spine Road

As described above, a connection between the central spine road of the development area, Arapaepae Road and the SE end of Liverpool Street could provide benefits in terms of the distribution of vehicle movements, safety and amenity.

While investigations are assessing the feasibility of such a connection, this does not form part of the PPC4 proposal (and the associated benefits have not been attributed to PPC4).

With the formation of such a connection being uncertain, it is appropriate to consider how the development area central spine road might connect to Arapaepae Road in this area, and how such connectivity might influence the wider effects associated with PPC4.

Any form of grade-separated connection would be precluded by cost considerations, and control by traffic signals is unlikely to be appropriate for a rural environment (and inconsistent with roundabout control at the Queen Street East and Tararua Road intersections). This leaves four principal options (shown in diagrammatic form by **Figure 6.6**):

- Option 1 (no connection): without (or prior to) the construction of the Ō2NL project, the volumes of through traffic on SH57 / Arapaepae Road would be much higher. Not forming a connection would maximise safety and efficiency of the SH57 route by eliminating the associated turning movements to/from the central spine road and Meadowvale Drive and avoiding a need for through movements to negotiate an intersection. A consequence would be higher volumes of traffic using other routes, especially Queen Street East.
- Option 2 (3-arm roundabout): this would allow turning movements to/from the central spine road to be safely accommodated, but with a small efficiency penalty to SH57 through movements. For safety to be assured, it is likely that this would need to be part of a package of measures which included improvements to the SH57 / Meadowvale Drive intersection and possibly also a further lowering of the speed limit in this immediate area.
- Option 3 (priority intersection): this option would be precluded by the unacceptable safety risks associated with turning movements within a higher speed environment.
- Option 4 (left-in / left-out movements only): this option would only offer a partial solution, as movements exiting Tara-Ika would be unable to access Meadowvale Drive. A safety concern would be associated with the possibility of U-turning manoeuvres made by some drivers.

The preferred option is a roundabout at this location, as this would allow full connectivity to be provided while also offering flexibility to connect to a possible extension of Liverpool Street (subject to the necessary approvals). As noted above, such a solution would, without an extension of Liverpool Street, increase the right turn exit movement from Meadowvale Drive and would need to be considered as part of a wider package of measures to ensure the safety and efficiency of Arapaepae Road.

As described in **Section 4**, any residential development at Tara-Ika would be subject to a requirement to demonstrate that the associated traffic movements can be safely and efficiently accommodated by the road network. This 'backstop' means that the possibility of any potential safety and/or capacity issues would be precluded by the assessments required as a condition of consent. Specifically, the form of any connection between the central spine road and SH57 / Arapaepae Road would need to be demonstrably safe and efficient. Alternatively, if the formation of an acceptable intersection form was not possible, it would need to be demonstrated that without any connection at this location, other parts of the road network would be able to accommodate the higher traffic volumes which would eventuate.

6.6 Pedestrian / Cycle Connectivity

Internal

A high level of internal connectivity is proposed by a network of cycleways and footpaths, including an 'ecological corridor' connecting to the Waiopahu Reserve.

The proposed rule (15A.6.1.1) prohibiting the formation of vehicle crossings over strategic cycleways is supported, on the basis that this demonstrates a more serious commitment to the promotion of cycling as a mode of transportation. The potential for conflicts at vehicle crossings represents both an actual and a perceived risk for cyclists which would deter some from using this mode of transport.

Virtually all of the cycle connections are provided within road corridors, with a consequence that walking and cycling will take place adjacent to traffic activity. Although the additional benefits may be marginal, consideration could be given to the provision of off-road connections if these are reasonably feasible within the wider development area.

External

The Masterplan shows proposed walking and cycling connections as far as the boundaries of the Tara-Ika area. In order to encourage the uptake of pedestrian and cycle activity between Tara-Ika and the existing Levin urban area, the routes within the site should form part of a wider and contiguous network (but it is recognised that the provision of facilities beyond Tara-Ika would be outside of the scope of PPC4).

This means that details of how the SH57 corridor is to be crossed should be provided, together with proposals for the enhancement of facilities to the west of this point. This will be more relevant with the higher SH57 traffic volumes if the Ō2NL project was not to proceed (or occurred significantly later than development at Tara-Ika).

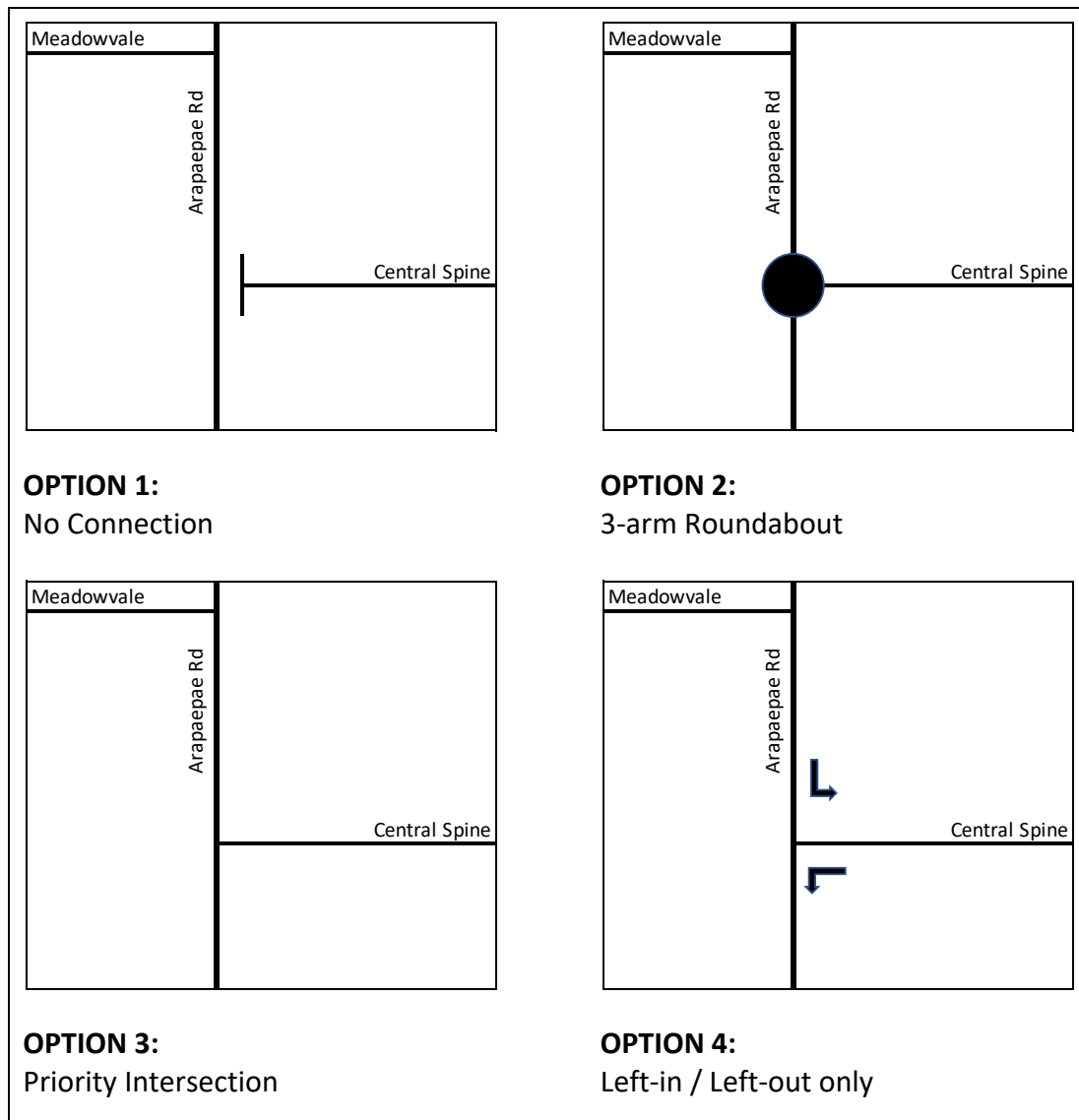


FIGURE 6.6: CENTRAL SPINE ROAD CONNECTIVITY OPTIONS

6.7 Public Transport

The usage of public transport (bus) services is currently negligible in this area. Nonetheless, this could change in the future, partly as a result of the additional demand created by the Tara-Ika development and its distance from the Levin central area. The design of the Tara-Ika development does not preclude servicing by bus services, with plenty of room available within the road cross-sections and a network which avoids lengthy cul-de-sacs.

7 Response to Submissions

PPC4 was publicly notified in November 2020 and submissions closed in February 2021. Further submissions opened on 26 February 2021 and closed on 15 March 2021.

Table 7.1 responds to the transportation-related issues raised by the submissions.

TABLE 7.1: RESPONSE TO TRANSPORTATION ISSUES RAISED BY SUBMISSIONS

Issue	Raised By	Response (relevance to ITA)
Oppose local road / laneway adjacent to 180 Gladstone Rd	Stewart (#2)	<ul style="list-style-type: none"> detailed engineering issue
Development will result in Levin being bisected by the Ō2NL expressway	Austin (#4)	<ul style="list-style-type: none"> the proposal provides for good connectivity across the Ō2NL expressway, enabling E-W movement through the combined urban area
Need to consider effects of Ō2NL in consideration of PPC4	Nijhuis (#5)	<ul style="list-style-type: none"> transportation assessments have considered a comprehensive range of scenarios both with and without the Ō2NL expressway
Oppose any connection to Gladstone Rd on basis of its rural nature & use	Leighfield (#6)	<ul style="list-style-type: none"> Gladstone Road will not see any significant volume increases as development-related traffic movements will be primarily to/from the NW linkages to Gladstone Road would be beneficial for residents along this road by the provision of more direct access to facilities within the development area and Levin itself (by means of the central spine road and its linkage to Arapaepae Road, and Liverpool St if this connection is eventually formed)
Oppose concept of rear access lanes	Leighfield (#6)	<ul style="list-style-type: none"> the use of rear access lanes is necessary to avoid frequent crossings of the strategic cycleways (which the submitter supports) the submitter opposes rear access lanes largely on the basis of their perceived physical form and the possibility of criminal activity – in this regard the detailed design including the application of CPTED principles will be critical
Strategic cycleway should align with Collector road	Wickremasinghe (#9) Brown (#11)	<ul style="list-style-type: none"> the northern cycleway does follow a Collector Road (between Waiopēhu Reserve and the Ō2NL designation) – this would connect to Queen Street E
Cycleways should be provided as part of the fixed roads to ensure they are provided in a timely manner	Schibli (#12)	<ul style="list-style-type: none"> agree that a contiguous cycleway network should be a high priority at the outset of development
Cycleways – are short, without a circular route and not connected into the Levin cycleways	Morgan (#22)	<ul style="list-style-type: none"> cycle movements are likely to be primary between parts of the development and its central facilities, and to/from the existing Levin urban centre / schools. These movements will be reasonably well serviced by the network proposed (and noting that the use of roads by cyclists is not precluded)

TABLE 7.1: RESPONSE TO TRANSPORTATION ISSUES RAISED BY SUBMISSIONS

Issue	Raised By	Response (relevance to ITA)
		<ul style="list-style-type: none"> agree there is a need to co-ordinate with initiatives to ensure that contiguous facilities are provided within the existing urban area, but this is beyond the scope of PPC4
Street/road terminology used is inconsistent	Turner/Preston (#24)	<ul style="list-style-type: none"> agree – terminology used should align between documents
Intersection of SH57 and extension of Liverpool Street – does a proposal exist for a roundabout at this location?	Brown/HDRRA (#26)	<ul style="list-style-type: none"> while an extension of Liverpool Street would offer benefits, this is not essential and is not a part of the PPC4 proposal the form of connection to be provided between the Tara-Ika spine road and SH57 is currently being considered in liaison with WK-NZTA
Liverpool Street – oppose extension to provide access to Tara-Ika	Welch/Rangeview Villas (#29)	
Suggest changes to working of objectives and policies to better ensure provision for connectivity and public transport services	Tucker/Horizons (#30)	<ul style="list-style-type: none"> agree with all of the proposed wording amendments
Redwood Grove – roads shown on MP which extend over 42A, 42B, 43 and 43A Redwood Grove should be removed	Anderson/Redwood Grove (#31)	<ul style="list-style-type: none"> it is understood that the reasoning for these roads was in case of further subdivision within the Redwood Grove area and to future-proof connectivity between Redwood Grove and Tara-Ika as noted on the Structure Plan, there is flexibility in the location of local roads
Oppose rule (15A.6.1.1) which prohibits access across strategic cycleways	Leith (#32) Truebridge (#33)	<ul style="list-style-type: none"> (refer responses above)
Growth Projections – the adopted projections are significantly higher than those prepared by Stats NZ and based on premise that Wellington Northern Corridor completed including Ō2NL	Jarrett/WK-NZTA (#34)	<ul style="list-style-type: none"> HDC is confident that the growth projections are soundly based, and that growth will be realised irrespective of the Ō2NL expressway

TABLE 7.1: RESPONSE TO TRANSPORTATION ISSUES RAISED BY SUBMISSIONS

Issue	Raised By	Response (relevance to ITA)
Connectivity across SH57 / Ō2NL – lack of detail provided, potential impacts on N-S movements. Reliance on Liverpool St needs to be explored further	Jarrett/WK-NZTA (#34)	<ul style="list-style-type: none"> while an extension of Liverpool Street would offer benefits, this is not essential and is not a part of the PPC4 proposal the form of connection to be provided between the Tara-Ika spine road and SH57 is currently being considered in liaison with WK-NZTA
Need for staged development with thresholds linked to infrastructure upgrades, to be reflected in discretion applied to subdivision	Jarrett/WK-NZTA (#34)	<ul style="list-style-type: none"> the matters of discretion applicable to subdivision in the residential zone will ensure that development cannot proceed ahead of the provision of the necessary infrastructure to support the associated demand
Road hierarchy – request consistency with One Network Road Classification System	Jarrett/WK-NZTA (#34)	<ul style="list-style-type: none"> agree
ITA – normally included with s32 assessment, to enable understanding of potential transportation impacts	Jarrett/WK-NZTA (#34)	<ul style="list-style-type: none"> this document provides the required ITA and assessment of potential transportation impacts
Liverpool Street - support use for connecting development to existing township and encourage HDC to prioritise its development	Jarrett/WK-NZTA (#34)	<ul style="list-style-type: none"> as noted above, while the benefits of such a linkage are recognised, this does not form a part of PPC4
Pohutakawa Drive – should include ped/cycle connections to Tara-Ika	McKay (#36)	<ul style="list-style-type: none"> agree
Concern with potential roundabout design	Bold (#40)	<ul style="list-style-type: none"> any new or upgraded intersections are required to meet current design criteria and are subject to a rigorous safety audit process, ensuring their safety of use
Standard & location of NW Collector road	Prouse (#38)	<ul style="list-style-type: none"> submitter considers that this road should be of a 'local' road standard, partly because of anticipated lower levels of traffic activity. but volumes using this road will be primarily a function of its alignment in providing a convenient route – the road standard will not significantly influence volumes. The 'Collector' road status would instead provide for a higher standard

TABLE 7.1: RESPONSE TO TRANSPORTATION ISSUES RAISED BY SUBMISSIONS

Issue	Raised By	Response (relevance to ITA)
		<p>of adjacent pedestrian and cycle facilities, which will be important for this connection to/from Queen Street East.</p> <ul style="list-style-type: none">• Small changes to the positioning of this road would not materially affect its functionality or likely traffic volumes.

8 Conclusions & Recommendations

8.1 Conclusions

This assessment has reviewed the transportation aspects of PPC4 which would enable a higher density of residential development within the Tara-Ika area to the east of Levin.

The conclusions of this assessment are:

- the progression of the Ō2NL project is not an essential pre-requisite for development at Tara-Ika;
- the Ō2NL project and the progression of development at Tara-Ika enabled by PPC4 would be mutually beneficial, in that development would benefit from accessibility and the safety / efficiency benefits of the Ō2NL project would be enhanced by proximity to development;
- even under an optimistic scenario, the Ō2NL project is unlikely to be open to traffic for several years following the commencement of development at Tara-Ika – accordingly, scenarios without the Ō2NL project in place are relevant to any consideration of the effects associated with PPC4;
- the traffic modelling which has formed the basis of the PPC4 traffic assessments appears to be robust and has been the subject of a separate peer review process;
- the additional traffic activity which would be associated with the higher density of development can be accommodated by the area road network without capacity problems at the intersections in the vicinity of Tara-Ika;
- the inclusion in the traffic model of development in areas which will be subject to separate and future plan change requests while not strictly correct, results in an overall ‘worst case’ assessment of capacity performance;
- similarly, the traffic modelling has assumed the upper level of potential residential development within Tara-Ika;
- the pattern of development enabled by PPC4 will be beneficial for the efficiency of the SH1 corridor through central Levin, irrespective of the construction of the Ō2NL project;
- the provision of a connection between the central spine road within Tara-Ika and Liverpool Street would offer significant transportation benefits but does not form part of the PPC4 proposal;
- the most likely form of a connection between the central spine road and SH57 / Arapaepae Road would be a roundabout, as this would provide for full connectivity (including a connection to Liverpool Street if this is eventually enabled), while being able to safely and efficiently accommodate expected traffic volumes;
- any such intersection would need to be part of a package of measures along this section of SH57 / Arapaepae Road to ensure the safety of all turning movements;

- the growth and future levels of traffic demand are subject to uncertainty associated with the general economic conditions, the timing of the Ō2NL project, the rate at which development proceeds and the formation of any connection to Liverpool Street; and
- in the context of such uncertainty, the requirement for all residential development to secure consent subject to demonstrating that the safety and/or efficiency of the transportation network would not be comprised represents an important safeguard.

Overall, it is considered that the modelling work undertaken together with the proposed PPC4 rules will avoid the possibility of adverse effects upon the operation of the transportation network associated with development enabled by PPC4.

8.2 Recommendations

A number of recommendations arise from this assessment:

- the potential benefits associated with a connection to Liverpool Street means that work should be undertaken (outside of PPC4) to determine the feasibility and issues associated with the formation of such a link;
- a package of measures associated with the formation of a roundabout at the spine road / Arapaepae Road intersection should be developed and agreed with WK-NZTA;
- consideration should be given to the inclusion of off-road cycle connections within the Tara-Ika area;
- cycling and pedestrian facilities within the eastern part of Levin and across Arapaepae Road / SH57 should be reviewed to ensure the provision of high-standard and contiguous routes between Tara-Ika and the town centre;
- the proposed road carriageway widths within Tara-Ika should be reviewed and the hierarchy adopted should be consistent with the One Network Road Classification System; and
- frequent intersections between local roads within the development and Arapaepae Road should be avoided in preference to access at fewer locations where safety can be controlled.

Appendix 12: Statement of Evidence – Traffic

BEFORE THE HOROWHENUA DISTRICT COUNCIL

In the Matter Of: the Resource Management Act 1991

And

In the Matter Of: Proposed Plan Change 4 – Tara-Ika
Growth Area

STATEMENT OF EVIDENCE

Evidence of: TIM KELLY, Director Tim Kelly Transportation Planning Ltd

Subject Area: Transportation Issues

On Behalf of: Applicant (Horowhenua District Council)

Date: November 2021

INTRODUCTION

- 1 My name is Tim Kelly. I am a director of my own traffic engineering and transportation planning practice.
- 2 I have worked in the traffic engineering and transportation planning field since 1983. I hold a Bachelor of Arts degree in Geography, and a Master of Science degree in Traffic Engineering and Transportation Planning, both from the University of Sheffield in the United Kingdom.
- 3 I am a full Member of the Chartered Institute of Logistics and Transport, and the IPENZ Transportation Group (a Technical Interest Group of IPENZ).
- 4 My career to date has been spent in the consultancy sector of transportation, in both the United Kingdom and New Zealand. During my career, I have provided policy advice regarding traffic and transportation matters, and I have undertaken assessments for a wide variety of development proposals across New Zealand.
- 5 This experience includes work on a variety of projects in the southern part of the North Island.

CODE OF CONDUCT STATEMENT

- 6 While this is not an Environment Court hearing, I nonetheless confirm that I have read the Code of Conduct for Expert Witnesses issued as part of the Environment Court Practice Notes. I agree to comply with the Code and am satisfied that the matters which I address in my evidence are within my field of expertise. I am not aware of any material facts that I have omitted which might alter or detract from the opinions I express in my evidence. I understand that I have an overriding duty to assist the hearing in an impartial manner and that I am not an advocate for the party which has engaged me.

INVOLVEMENT

- 7 I was approached by the Horowhenua District Council (**HDC**) in March 2021 to initially review the transportation issues associated with the development that would be enabled by Proposed Plan Change 4 (**PPC4**) and then subsequently to prepare an Integrated Transportation Assessment (**ITA**), dated September 2021. This was commissioned after the plan change was notified and so did not form part of the PPC4 application material. This document is reproduced as **Attachment 1** to this evidence.
- 8 My engagement with HDC has involved:
- a review of the relevant background material (proposed plan change, traffic model documentation, traffic counts, submissions, etc);
 - a (physical) meeting with HDC officers to discuss and review the relevant issues;
 - site visits to observe and record conditions directly;
 - numerous (on-line) meetings with HDC officers, Waka Kotahi (**WK**) personnel and others; and
 - the preparation of the ITA document.
- 9 Since this time, I have reviewed the s42A report prepared by the planning officer for HDC. Finally, I have prepared this statement of evidence.

KEY TRANSPORTATION ISSUES

- 10 I do not intend to repeat the content of my September 2021 report. The overall conclusion of the ITA is that the proposed controls which form part of PPC4 will avoid the possibility of adverse effects upon the operation of the transportation network associated

with the pattern of development which is anticipated to occur. However, the ITA identified and addressed a number of relevant issues, which I summarise below.

Liverpool Street Extension

- 11 The Masterplan and Structure Plan identify a central spine road within the development running NW-SE and connecting to State Highway 57 (**SH57**) / Arapaepae Road.
- 12 The Liverpool Street Extension (**LSE**), if constructed, would connect the existing Liverpool Street to the west with SH57/Arapaepae Road and the central spine road.
- 13 The LSE is not currently proposed and does not form a part of the PPC4 / Tara-Ika proposal.
- 14 Nonetheless, the LSE would, by providing a more direct connection between the development area and the existing Levin urban area, offer significant transportation benefits.
- 15 While the LSE would be beneficial, development of the Tara-Ika area is not dependent upon this connectivity. The consequence of not providing the LSE would be less direct travel with greater use of Queen Street East and Tararua Road – but there is no indication that these corridors or intersections would be unable to accommodate this demand.
- 16 In my view, the central spine road / Arapaepae Road connection should be in the form of a roundabout, as this would allow full connectivity to be provided while also offering flexibility to connect to a possible future LSE (subject to the necessary approvals). Such a solution would, without an extension of Liverpool Street, need to be considered as part of a wider package of measures to ensure the safety and efficiency of Arapaepae Road. These issues should be addressed as part of the assessments required to secure consent, when better information is likely to be available regarding the progression / timing of the Ōtaki to North of Levin (**Ō2NL**) project and the proposed treatment of the Arapaepae Road corridor.

Growth & Effects on the SH1 Corridor

- 17 The needs for PPC4 and development in the Tara-Ika area arises from significant growth pressure across the district. HDC considers that this growth will occur, irrespective of the specific Tara-Ika proposal. This means that if PPC4 was not to become operative, higher

rates of growth would occur at other locations within the district.

- 18 These other locations would be better served by the existing State Highway 1 (SH1) corridor. Consequently, development enabled by PPC4 would have the beneficial effect of reducing future traffic demands along the existing SH1 corridor through central Levin, relative to a scenario in which the development occurred closer to this corridor. This is described at Section 6.5 and Figure 6.5 of the ITA.
- 19 WK considers that a realisation of the growth projections is reliant upon the improvements in accessibility attributable to the Ō2NL project and other expressway projects to the north of Wellington. HDC is confident that the growth projections will be realised irrespective of the Ō2NL project but that (as I have just described) the distribution of the growth would be likely to be different. I address this matter further in response to the issues raised by submissions.

Reliance upon the Ō2NL project

- 20 The Ō2NL project provides immediate accessibility to the strategic road network for the development. With the PPC4 process proceeding ahead of the designation process for Ō2NL, it is likely that some development will proceed in advance of Ō2NL. Although the current indications from Government are that the Ō2NL project is to be advanced, the programme for the project inevitably remains subject to future funding and political decisions.
- 21 For these reasons, assessments have addressed the possibility of the development enabled by PPC4 proceeding without Ō2NL in place. These indicate that, even for this 'worst case' scenario, the road network would be able to accommodate the increased traffic activity.

Need for Development Thresholds

- 22 It is important that development does not precede the ability of the adjoining transportation infrastructure to accommodate the associated increases in demand.
- 23 All residential development enabled by PPC4 will have restricted discretionary activity status. The associated matters of discretion require a consideration of the transportation impacts of the development, ensuring that any potential safety or capacity issues are addressed. With development expected to occur in blocks, this 'backstop' will ensure that

the extent of cumulative development does not precede the availability of appropriate infrastructure. For this reason, no specific thresholds are required to be identified.

Cycling and Walking Connectivity

- 24 The promotion of alternative modes of transportation to the private car is an integral part of the development proposals. In particular, the distance to/from the established urban centre of Levin means that cycling is a viable alternative to the private car (especially with the increasing uptake of e-bikes). In my view, any new development area should maximise the promotion of walking and cycling and the PPC4 proposals achieve this with a high level of connectivity both within the development and beyond.
- 25 The perceived safety environment for cycling is a significant factor in cycling uptake. In this respect, I support the proposed rule which would prevent the formation of driveways across strategic cycleways.

RESPONSE TO SUBMISSIONS

- 26 I have reviewed all of the submissions made in response to PPC4. In doing so, I am aware that these submissions were made without the benefit of the ITA document.
- 27 I have addressed issues raised by the submissions at Section 7 of the ITA.
- 28 I have provided some further explanation below with regard to my response to the issues raised by the WK submission.

Growth & Dependence upon Ō2NL

- 29 WK observes that the Council's adopted growth projections are significantly higher than those prepared by Statistics New Zealand (**SNZ**) and are based on a premise that the Wellington Northern Corridor will be completed, including the Ō2NL project.
- 30 There is no doubt that major roading projects result in significant improvements in accessibility which, in turn, translates into additional development pressure and transportation demand.
- 31 The growth projections which underlie the transportation modelling were prepared by Sense Partners (**SP**) for HDC (documented in a report dated June 2020 forming Appendix 10 to the s32 report). The SP analysis recognises that improved roading contributes to the recent and forecast growth. It also notes that, while fertility / mortality assumptions are

similar to those adopted by SNZ, the main factors behind the higher growth forecasts relate to international migration and rates of domestic migration into Horowhenua.

32 Given this, it appears that growth is primarily driven by these factors and the roading projects to the south which are already complete or due to open in the near future. In this context, the more specific impacts of the Ō2NL project are likely to relate to the distribution, rather than the overall quantum of growth across the district.

33 In my view, this issue is rather academic, since there is now a reasonably high level of certainty that the Ō2NL project will proceed and the analysis has indicated that the traffic activity associated with development at Tara-Ika can be accommodated by the road network even without the Ō2NL project.

Reliance on Liverpool Street and Support Use of Liverpool Street

34 I have discussed issues associated with the LSE above.

35 WK has encouraged HDC to prioritise the development of the LSE. While this is being done, it is emphasised that the LSE does not form a part of the PPC4 proposals, and PPC4 is not reliant upon the LSE to avoid adverse effects upon the transportation network.

Need for Staged Development with Development Thresholds

36 As I have described above, it is agreed that development needs to be integrated with infrastructure provision.

37 In my view, the provisions of PPC4 which are proposed provide sufficient safeguards to ensure that the effects of each stage of development are taken into account during the consent process.

Need for an ITA to Understand Potential Transportation Impacts

38 It is unfortunate that an ITA was not available as part of the PPC4 application documentation.

39 The process of preparing the September 2021 ITA has involved extensive liaison with WK officers, ensuring that its concerns have been acknowledged and addressed.

REPORT OF THE PLANNING OFFICER

40 I have reviewed the report of the HDC planning officer, Lauren Baddock, dated October

2021.

- 41 The overall recommendation of this report is that the plan change be accepted, subject to a number of amendments.
- 42 I agree with the analysis of the planning officer, the responses to issues raised in submissions and the suggested amendments.

CLOSURE

- 43 In my view, the extensive modelling work which has been undertaken demonstrates that the development enabled by PPC4 can be accommodated by the transportation network, even for an unlikely scenario in which the Ō2NL project was significantly delayed or did not proceed at all.
- 44 Provided that the central spine road is only connected to SH57 / Arapaepae Road in the form of a roundabout and with consideration of the wider safety environment within this corridor, there is no reason why the safety of the SH57 / Arapaepae Road route would be compromised by the effects of development.
- 45 Liaison with WK has ensured that the concerns identified in its submission have been addressed and that the development can take place without adverse effects upon the operation of the state highway or local road networks which are any more than minor.
- 46 On the basis of the transportation issues which I have addressed, I recommend that PPC4 be approved.

Tim Kelly

November 2021

ATTACHMENT 1

Horowhenua District Plan, Proposed Plan Change 4, Tara-Ika: Integrated Transportation Assessment.

Tim Kelly Transportation Planning Ltd., September 2021.

Appendix 13: Cultural Impact Assessment

Muaūpoko Cultural Impact Assessment- Proposed plan change 4 Tara-Ika Growth Area

FOR MUAŪPOKO TRIBAL AUTHORITY

OCTOBER 2021



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1 Introduction

This report has been prepared by Kāhu Environmental for Muaūpoko Tribal Authority Incorporated (MTA). Kāhu Environmental is a team of planning, environmental and kaupapa taiao specialists. MTA is recognised as the mandated iwi organisation for Muaūpoko. The purpose of the report is to advise Horowhenua District Council (HDC) of the impacts the proposed Plan Change 4: Tara-Ika Growth Area (the growth area) will have on Muaūpoko values detailed in the Tara Ika Cultural Values Assessment and Muaūpoko Tribal Authority submission, and make recommendations to avoid and minimise effects on cultural values. The report should be considered as a point in time, based on available information. Muaūpoko will need to work closely with council and consent applicants throughout development and in an on-going manner to ensure their values are protected in line with Muaūpoko tikanga.

2 Project Description

Horowhenua District Council (HDC) has identified an area of approximately 470 hectares east of Levin (Taitoko) as an urban growth area (Figure 1). The proposed Plan Change 4: Tara-Ika Growth Area (proposed Plan Change) provides for over 3500 new dwellings and is an important component of council strategy to meet the demands of the rapidly growing population within the Horowhenua over the next 10 years and beyond.

The area is called Tara-Ika. Muaūpoko have a very strong cultural and spiritual connection to Tara Ika and gifted the proposed Plan Change its name.

The locations of key roads, pedestrian and cycleway connections, public reserves and open space, and a new village centre have been designated by a Master Plan. In addition to this, the objectives and policies sets out guidance on housing typology, property sizes, stormwater management approaches, street and commercial design. A key outcome of the proposed Plan Change process is to ensure new development is well designed and connected, develops in a coordinated manner, provides appropriate infrastructure services, and protects local amenity and the natural and cultural environment from adverse effects.

3 Methodology

Effects assessments are step-wise processes that provide robust and transparent recommendations on how development should avoid, mitigate and manage adverse effects on various aspects of the environment, including the cultural environment.

MTA have compiled an expert team of cultural advisors to oversee the development of this comprehensive Cultural Impact Assessment (CIA). They have contributed to the following discussion:

- a. The identification of the baseline state of the environment, cultural values and their relative importance
- b. The cultural and spiritual impacts of the proposed Plan Change including the magnitude and overall level of effects
- c. The development of recommendations on how to manage any adverse effects on cultural values to an acceptable level, and
- d. How the development of the area should occur to meet the values and aspirations of Muaūpoko for urban development.

The assessment is limited to the effects of the proposed Plan Change on Muaūpoko values contained within the Muaūpoko Cultural Values Assessment¹ and MTA Submission 35. Further information is drawn from a range of sources that describe and reference the state of the cultural environment. It is assumed that the Master Plan and associated plans accurately depict the project intent and scale. The assessment does not cover the effects related to individual lot development on Muaūpoko values, which will require further assessment during subsequent consent phases.

3.1 Determining the Baseline

The existing state of the cultural environment is important in order to gauge the effects of the proposed Plan Change. Muaūpoko connection to their lands, waterways, sites and taonga has not diminished with the passing of time or succession of generations. Muaūpoko values often still exist, even when deforestation, drainage and stopbanks have removed all physical trace of what was once there. The existing state of the cultural environment has been determined by the following:

- a. A literature study (sources identified in footnotes);
- b. Communications with the MTA cultural advisory team; and
- c. A series of site visits to Waiopahu Reserve, bush remnants adjacent to Arapaepae Road and Queen Street, and along all key outer roads.

3.2 Cultural Values

The key cultural values to assess against the proposed Plan Change have been drawn from the Muaūpoko Cultural Values Assessment and MTA Submission 35. A Cultural Values Assessment Framework (the Framework) and set of attributes were developed to rank the relative importance of each of the values described. The Framework assigns a five-scale classification to each criteria: Very High, High, Moderate, Low and Negligible.

¹ Muaūpoko Tribal Authority (2020). *Muaūpoko Cultural Values Assessment: Gladstone Green area.*

Table 1: Cultural Values Assessment Framework.

Framework Values	Attributes
Muaūpoko worldview	1. Connection to atua and the wider environment
	2. Muaūpoko whakapapa
	3. Relationships with Muaūpoko mātauranga
Kaitiakitanga	4. The mauri of the area
	5. Relationships with taonga species and habitats. Consideration of lifecycles, daily or seasonal availability of habitat and utilisation
	6. Ngā wai ora
	7. Manaakitanga: Muaūpoko priorities for protection
Rangatiratanga	8. Relationship with traditional lands, sites and villages
	9. Relationship with significant rivers, streams, springs, wetlands and lakes
	10. Importance of site history and key events
	11. Relationship with culture, customs and behaviours
Whare Tapa Wha	12. Taha Tinana (physical health): access to Muaūpoko turangawaewae and traditional resources
	13. Taha Wairua (spiritual health): connection with the spiritual realm and wairua
	14. Taha Whānau (family health): Housing affordability and diversity for whānau
	15. Taha Hinengaro (mental health): importance to Muaūpoko identity

3.3 Magnitude Of Effects

The next step is to determine the magnitude of cultural effects of activities (including construction and on-going operation) resulting from the proposed Plan Change, both in:

- The absence of any effects management actions, and
- After any effects management actions have been applied.

The assessment applies a 6-scale classification (in Table 2) to the magnitude of effects on Muaūpoko values associated with the proposed Plan Change area.

Magnitude is a measure of change/alteration from the existing baseline state. Assessing the magnitude of effects takes into account:

- The level of confidence that effects will occur in the way anticipated
- The spatial scale/extent of the effect
- The duration of the effect (temporary versus permanence described)
- Whether the potential effect is reversible, and
- The timing of the effect in relation to environmental cycles and patterns.

Table 2: Magnitude classification system description.

Magnitude	Description
Very high	Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR

	Loss of a very high proportion of the known value or range of the element/feature.
High	Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known values or range of the element/feature.
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known values or range of the element/feature
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR Having a minor effect on the known value or range of the element/feature
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known value or range of the element/feature.
Positive	Enhancement above baseline condition. Change is beneficial to values and attributes AND/OR promoting the value or range of the element/feature.

3.4 Level of Effects

To determine the overall level of effects based on the cultural value and magnitude of effects, a matrix approach shown in Table 3 is applied. This matrix describes the overall level of effects on a 6-point scale, including Net Gain, Very Low, Low, Moderate, High, and Very High. Where the effects cannot be reduced to an acceptable level, further avoidance, remedying, or mitigation maybe required on site. If that is not possible or practical, offsetting or compensation can be applied elsewhere.

The level of effects are then applied in a Resource Management Act 1991 (RMA) context:

- Net Gain:** Positive effects.
- Very Low:** Adverse effects that are discernible day-to-day effects, but too small to adversely affect other persons.
- Low:** Adverse effects that are noticeable but will not cause any significant adverse impacts.
- Moderate:** Adverse effects that are noticeable that may cause an adverse impact but could be potentially mitigated or remedied.
- High:** An effect that is noticeable and will have a serious adverse impact on the environment but could potentially be mitigated or remedied.
- Very High:** Extensive adverse effects that cannot be avoided, remedied or mitigated.

Table 3: Level of Effects Matrix.

		Cultural Value				
		Very high	High	Moderate	Low	Negligible
Magnitude	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

3.5 Statutory Considerations

3.5.1 Resource Management Act 1991

Section 6 Matters of national importance

In achieving the purpose of the Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna
- (e) the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga.

Section 7 Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to:

- (a) kaitiakitanga
- (d) the intrinsic values of ecosystems.
- (f) maintenance and enhancement of the quality of the environment

Kaitiakitanga is defined in section 2 means “the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori in relation to natural and physical resources; and includes the ethic of stewardship.

Section 8 Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Tiriti o Waitangi principles include the principles of partnership, participation and protection. These underpin the relationship between the Crown and Māori and are derived from the underlying Treaty tenets. Of particular relevance is Article 2 of the Te Tiriti o Waitangi, which states:

“Her Majesty the Queen of England confirms and guarantees to the Chiefs and Tribes of New Zealand and to the respective families and individuals thereof the full exclusive and undisturbed possession of their Lands and Estates, Forests, Fisheries and other properties which they may collectively or individually possess so long as it is their wish and desire to retain the same in their possession; but the Chiefs of the United Tribes and the individual Chiefs yield to Her Majesty the exclusive right of Pre-emption over such lands as the proprietors thereof may be disposed to alienate at such prices as

may be agreed upon between the respective Proprietors and persons appointed by Her Majesty to treat with them in that behalf”.

3.5.2 National Policy Statement for Freshwater Management 2020

The National Policy for Freshwater Management 2020 (NPSFM 2020) requires a completely different approach for freshwater management. Te Mana o te Wai is now the fundamental concept for all freshwater decision-making, and councils **must give effect** to it. Councils must also **actively involve** tangata whenua in all freshwater management, including decision-making.²

Te Mana o te Wai encompasses 6 key principles relating to the role of tangata whenua that include:

- (a) Mana Whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater
- (b) Kaitiakitanga: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations
- (c) Manaakitanga: the process by which tangata whenua show respect, generosity, and care for freshwater and for others
- (d) Governance: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future
- (e) Stewardship: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations, and
- (f) Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

Te Mana o te Wai also has a hierarchy of obligations that prioritises:

- (a) First, the health and well-being of water bodies and freshwater ecosystems
- (b) Second, the health needs of people (such as drinking water)
- (c) Third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

Other significant provisions are set out below:

² See Policy 2.

Policy 2 states that tangata whenua must be actively involved in freshwater management (including decision-making processes), and Māori freshwater values must be identified and provided for.

Policy 3 states that freshwater must be managed in an **integrated way** that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.

Clause 3.4 of the NPSFM states that every local authority must actively involve tangata whenua (to the extent they wish to be involved) in freshwater management (including decision-making processes), including in all the following:

- (a) identifying the local approach to giving to Te Mana o te Wai
- (b) making or changing regional policy statements and regional and district plans so far as they relate to freshwater
- (c) implementing the NOF
- (d) developing and implementing mātauranga Māori and other monitoring.

Clause 3.5 addresses integrated management which requires adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, which requires that local authorities must:

- (a) recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea, and
- (b) recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments, and
- (c) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments, and
- (d) encourage co-ordination and sequencing of regional or urban growth.

3.5.3 National Policy Statement for Urban Development 2020

Objective 5 of the National Policy Statement on Urban Development 2020 (NPS-UD) states that planning decisions relating to urban environments, must take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Policy 9 of the NPS-UD says that local authorities, in taking account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi) in relation to urban environments must:

- (a) involve hapū and iwi in the preparation of RMA planning documents and any FDSs by undertaking effective consultation that is early, meaningful and, as far as practicable, in accordance with tikanga Māori, and

- (b) when preparing RMA planning documents and FDSs, take into account the values and aspirations of hapū and iwi for urban development, and
- (c) provide opportunities in appropriate circumstances for Māori involvement in decision-making on resource consents, designations, heritage orders, and water conservation orders, including in relation to sites of significance to Māori and issues of cultural significance, and
- (d) operate in a way that is consistent with iwi participation legislation.

3.5.4 Horizons One Plan: Te Ao Māori

Horizons Regional Council have yet to undertake Plan Change 3 to give effects to the NPSFM 2020.

Of note is Objective 2-1 of the Horizons One Plan, which states that for Te Ao Māori to be in place councils must:

- (a) have regard to the mauri of natural and physical resources to enable hapū and iwi to provide for their social, economic and cultural well-being,
- (b) kaitiakitanga must be given particular regard and the relationship of hapū and iwi with their ancestral lands, water, sites, wāhi tapu and other taonga (including wāhi tupuna) must be recognised and provided through resource management processes.

Policy 2-1 of the One Plan states that:

- (a) there will be involvement of hapū and iwi in resource consent, decision-making and planning processes in agreed ways.
- (b) the regional council will advise and encourage resource consent applicants to consult directly with hapū and iwi where it is necessary to identify:
 - a. the relationship of Māori and their cultural and traditional and their ancestral lands, water, sites, wāhi tappu, and other taonga (including wāhi tupuna), and
 - b. the actual and potential adverse effects of proposed activities on these relationships.

Policy 2-2 states that wāhi tapu, wāhi tupuna and other sites of significance to Māori are identified in the Regional Coastal Plan and District Plans, and

- (a) must be protected from inappropriate subdivision, use or development that would cause adverse effects on the qualities and features which contribute to the values of these sites, and
- (b) that the regional council must ensure that resource users and contractors have clear procedures in the event that wāhi tapu and wāhi tupuna are discovered.

3.5.5 Horizons One Plan: Biodiversity

Objective 6-1 of the Horizons One Plan for Indigenous Biological Diversity is to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna and maintain indigenous biological diversity, including enhancement where appropriate.

Policy 6-1 describes Responsibilities for maintaining indigenous biological diversity. In accordance with s62(1)(i) RMA, local authority responsibilities for controlling land use activities for the purpose of managing indigenous biological diversity in the Region are appointed as follows:

- (a) The Regional Council must be responsible for:
 - i. developing objectives, policies and methods for the purpose of establishing a Region-wide approach for maintaining indigenous biological diversity, including enhancement where appropriate
 - ii. developing rules controlling the use of land to protect areas of significant indigenous vegetation and significant habitats of indigenous fauna and to maintain indigenous biological diversity, including enhancement where appropriate.
- (b) Territorial Authorities must be responsible for: retaining schedules of notable trees and amenity trees in their district plans or such other measures as they see fit for the purpose of recognising amenity, intrinsic and cultural values associated with indigenous biological diversity, but not for the purpose of protecting significant indigenous vegetation and significant habitats of indigenous fauna as described in (a)(ii) above.
- (c) Both the Regional Council and Territorial Authorities must be responsible for: recognising and providing for matters of national importance (s6c) and having particular regard to other matters identified in s7d when exercising functions and powers under the RMA, outside the specific responsibilities allocated above, including when making decisions on resource consent applications.

Policy 6-2 states that:

- (a) rare and threatened habitats under Schedule F must be recognised as significant indigenous vegetation or significant habitats of indigenous fauna, and
- (b) at-risk habitats that are assessed as significant under Policy 13-5 must be recognised as significant indigenous vegetation or significant habitats or indigenous fauna,

- (c) the regional council must protect these habitats by the regulation of activities and through decisions on resource consents.

Policy 13-5 provides criteria for assessing the significance of habitats, including rare, threatened, or at-risk habitats defined in Schedule F of the One Plan, and provides additional criteria that may also trigger a habitat being assessed as significant, including:

- (a) representativeness
- (b) the presence of threatened species, or species at their distributional limits
- (c) ecological connectivity and/or buffering
- (d) ecological sequences.

Habitat types in the Manawatū-Wanganui Region are identified and then assigned the following status categories developed by Mayseyk (2007):

- (a) Rare: habitat types that were originally (pre-human) uncommon in the landscape and remain so.
- (b) Threatened: habitat types that have been reduced to 20% or less of former extent.
- (c) At risk: habitat types that have been reduced to 50% or less of former extent.
- (d) No threat category: habitat where 50% or greater of former extent remains.
- (e) Schedule F of the Horizons One Plan details indigenous biological diversity types subject to protection within the Plan.

Schedule F1 of the Horizons One Plan also identifies habitat types that are classified as rare or threatened.

Table F2 provides a list of further criteria (for example, size thresholds) that must be met before an area of any habitat type described in Table F1 qualifies as a rare, threatened or at-risk habitat for the purposes of the Plan.

3.5.6 Horowhenua District Plan

Indigenous Biological Diversity

Objective 3.2.1: To protect the areas of significant indigenous vegetation and significant habitats of indigenous fauna.

Policy 3.2.2: Manage the effects of subdivision, use and development to avoid, remedy or mitigate the adverse effects on areas of significant indigenous vegetation and significant habitats of indigenous fauna and the intrinsic values of ecosystems.

Policy 3.2.3 Encourage subdivision, land use and development that maintains and enhances indigenous biological diversity through the protection and enhancement of areas of significant indigenous vegetation and significant habitats of indigenous fauna.

Rivers, Lakes and other waterbodies

Policy 3.3.3: Manage the design, location and scale of subdivision and/or land development and use adjoining lakes, rivers, wetlands and other water bodies so they retain their special values and natural character.

Policy 3.3.4 Ensure subdivision, use and development protects the natural character of lakes, rivers, wetlands and other water bodies and maintain and enhance their special values by having regard to the following matters in assessing proposals:

Policy 3.3.8 Promote a strategic approach to the management of lakes, rivers, wetlands and other water bodies and their margins and catchments, particularly by using management plans for areas with significant environmental issues that require a collaborative approach with other groups or organisations.

Methods for Issue 3.3 and Objective 3.3.1

The use of collaboration, management plans or other approaches for achieving a strategic and coordinated approach to resolving significant environmental issues.

4 State of the Cultural Environment

4.1 Tangata Whenua: Muaūpoko

Muaūpoko rohe (tribal area) once stretched from the northern South Island to the Rangitikei River, however most of the people are now concentrated within the Horowhenua region. The area between Punahau, Lake Horowhenua and the Tararua Ranges, within which Tara-Ika is located, has never been occupied by any tribe other than Muaūpoko and the ancient people who preceded them.

The 52,000-acre Horowhenua block that includes Punahau, Lake Horowhenua would later become the Taitoko township through Native Land Court processes in 1873. This block was and still is today, Muaūpoko heartland. The proposed growth area is located on what became the 11,130-acre Horowhenua No. 3 block.

The Horowhenua No. 3 block was subdivided in 1890. The Māori owners attempted to protect the land from alienation through the Native Land Court, but the restrictions put in place were removed and (according to the Waitangi Tribunal) proved to be 'a worthless form of protection'. By 1900 only 4,246 acres remained in Muaūpoko ownership, and this balance was further eroded over the next few decades. Irrespective of legal ownership, Muaūpoko have maintained strong cultural, traditional and spiritual associations with all of their Horowhenua lands.

The concept of tangata whenua is key to understanding the environmental management philosophies of Māori. Tangata whenua as defined by the RMA is the customary authority exercised by an iwi or hapū in an identified area. It is the authority to control and manage a traditional area or resource in relation to prescribed customary, cultural and spiritual practices.

The authority is obtained through the relationship of the people and their ancestral connection to the land. Muaūpoko have maintained their position as tangata whenua within the Horowhenua block for over 1000 years and within the No. 3 block there are no overlapping interests from any other iwi or hapū.³⁴

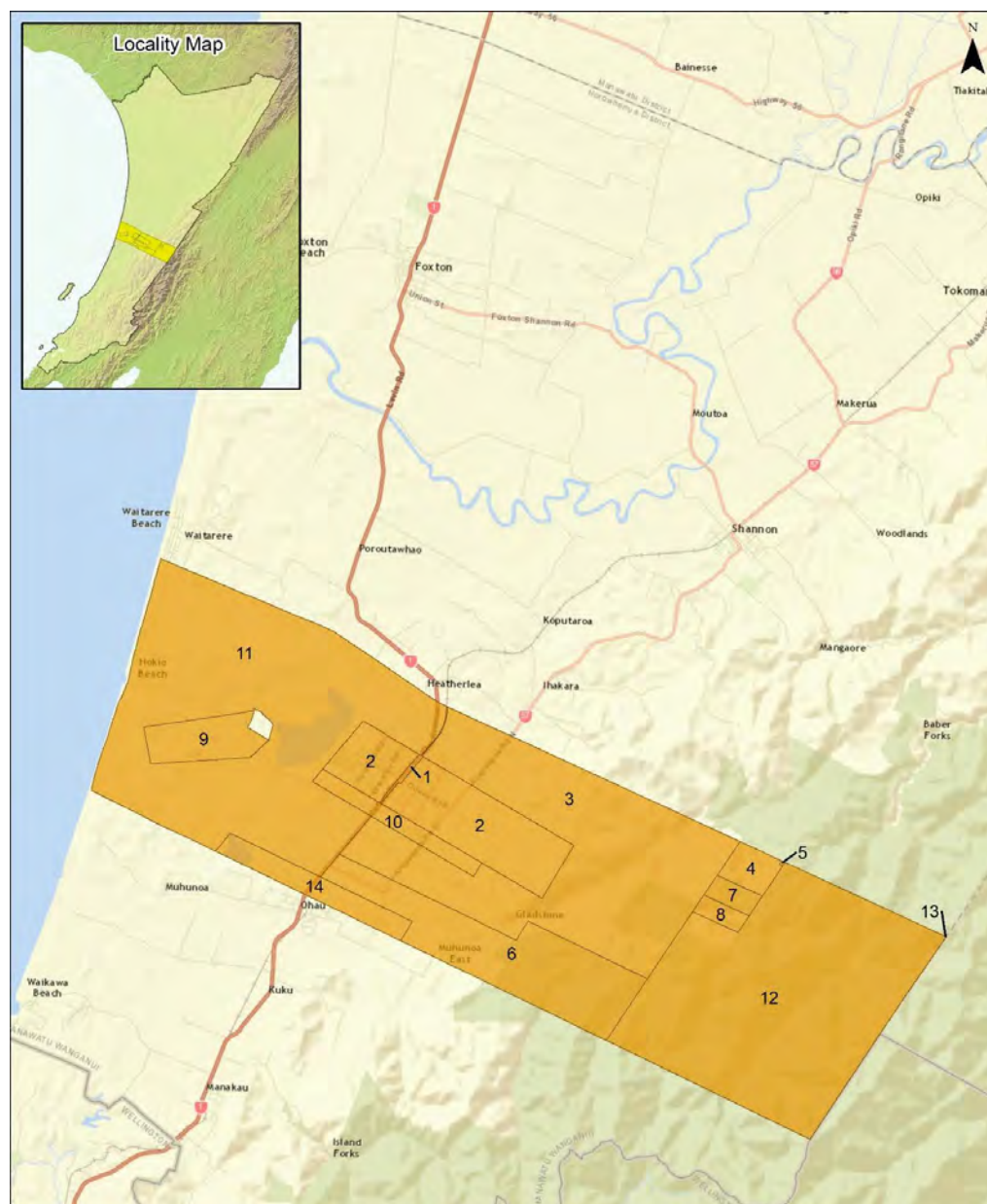


Figure 1: Subdivision of the Horowhenua Block in 1873

³ Louis Chase (2015). *Muaūpoko Oral Evidence and Traditional History Report*. WAI 2200 Porirua ki Manawātū District Inquiry. Commissioned by the Waitangi Tribunal: New Zealand.

⁴ D.A., Armstrong (2021). *Muaūpoko Origins, Rohe, Customary Interests and Sites of Significance*. History Works: New Zealand.

4.2 Punahau, Lake Horowhenua

Lake Horowhenua was traditionally known to Muaūpoko as Punahau (or Waipunahau), loosely translated as ‘the spring of vitality’. The name highlights the abundant life supporting capacity of the lake. Punahau was shrouded with dense forest of pukatea, kahikatea, and rata on the lake margin; huge wetland areas with a plentiful supply of kākahi (freshwater mussels), īnanga (whitebait), pātiki (flounder) and tuna (eels). Native birds such as the kererū were found in their thousands⁵. These species were the main staple diet for Muaūpoko. From the lake inland to the Tararua Range stood rangatira of nikau, tōtara, karaka, mātai, and rimu which provided food, shelter and other necessities for survival.

Drawing on historical records and interviewees’ living memories, Forbes describes the past 150 years of changes to the lake and wider environment as ‘rapid and overwhelming’. Those of the latter recounted vibrant stories of teeming fish stocks and stunning natural scenery now tinged with pain, sadness and loss because of these rapid changes. Many of those Muaūpoko spoke of their roles as kaitiaki of the land, rivers and streams, lakes and the coastline⁶. Adkin provided some useful commentaries, much of which is recounted from McDonald, noting how the heavily forested hinterland was replaced by railway and roads, as was the forested inner plain and foothills with farms. The destruction of the forest cover altered river courses and wetland functions, which were once able to control heavy rainfall discharges from the mountains. Floodwaters became swift and destructive, eroding the rich alluvial flatlands.⁷

Horowhenua means landslide in te reo Māori and is now the name used for Punahau. “Horowhenua” traditionally being used by Māori to describe the gravel fan that starts in the Tararua Ranges and culminates at the lake. Muaūpoko understand through their mātauranga that Horowhenua linked the Tararua ranges with Punahau, that the gravels contain the headwaters of Punahau, and the land upon which Tara-Ika sits is interconnected with the lake.

The gravel fan is referred to as Q2a gravels and is depicted in Figure 3. The gravels are highly porous and absorb the majority of rainwater within the landscape. It is only in particularly heavy rainfall events that surface-runoff channels form. As a result, groundwater levels are highly dynamic across the landscape and freshwater springs, known as puna, are common. There is only one permanent stream within the Tara-Ika landscape which is located in the northeast portion and is a tributary of the Koputaroa Stream.

⁵ O'Donnell, E, with McDonald J, Te Hekenga, p.25.

⁶ Forbes, S. (1996). *Te Waipunahau – Archaeological Survey*, (Prepared for the Horowhenua Lake Trustees).

⁷ Adkin, Horowhenua, pp.5-6.

Horowhenua 3D Geologic Model (GNS 2010)

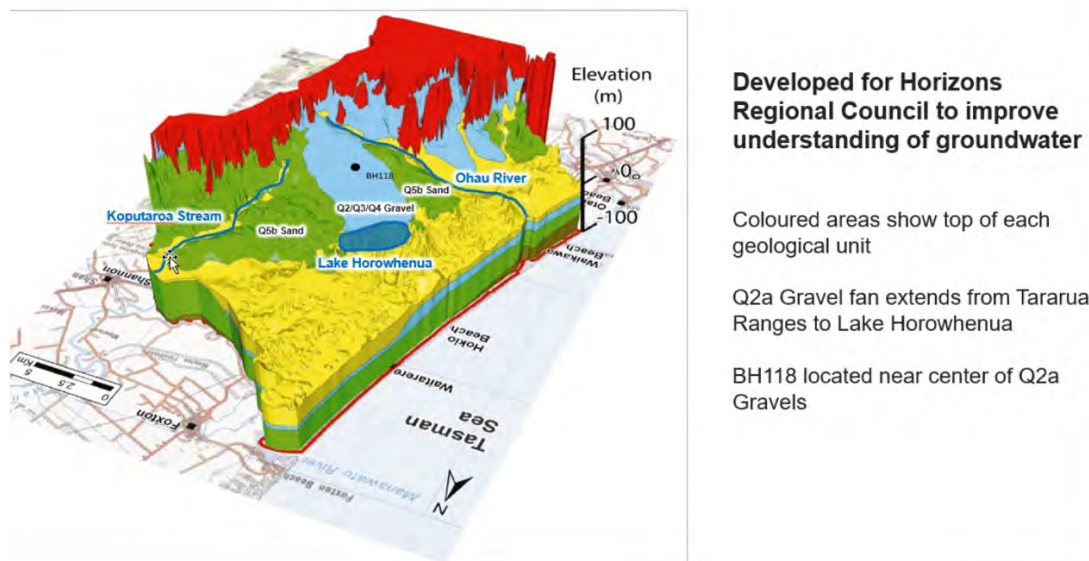


Figure 2: depicts the groundwater aquifer inland from the lake are fed from the Tararua Ranges and support Horowhenua Lake⁸

Although direct sewage discharge to Punahau ceased in 1987, today large amounts of nutrients, sediment and urban stormwater contamination from the Taitoko township continues, giving it a monitored ranking of 7/112 of the worst lakes in New Zealand⁹. The lake in the summer period is regularly closed due to the presence of cyanobacteria, caused by introduced nutrients and sediment adding to accumulated discharge elements already present.

Pollution and destruction of forest cover has not only affected the landscape and wai (water) but also the people. When reminiscing about traditional mahinga kai from the land, lakes and streams, Muaūpoko are clear that the current degradation is due to the township development, forest clearance and agricultural and primary industry land use. Many Muaūpoko speak about how their spiritual connection and their ability to sustain themselves physically from the whenua, lakes and streams has suffered immensely since European colonisation. As with anything rare or threatened it is even more highly valued as a result.

⁸ Lake Horowhenua and Hokio Stream Catchment Management Strategy, Manawatu-Wanganui Regional Council, 1998.p.9.

⁹ He Hokioi Rerenga Tahi, The Lake Horowhenua Accord Action Plan 2014-2016,' (An accord between Lake Horowhenua Trust; Horowhenua Lake Domain Board; Horowhenua District Council; Horizons Regional Council; and, Department of Conservation).

4.3 Partnership

One of the reasons for the Horowhenua block subdivision was the desire by Muaūpoko to establish a European-style township on the eastern shores of the lake. The township was to be built on a proposed railway route and would, in Muaūpoko estimation, provide a range of significant economic and social benefits, including a market for their agricultural and horticultural produce, and a substantial increase in the value of their surrounding lands. The township would also provide sought-after educational opportunities for Muaūpoko children and youth. An agreement was drawn up to provide for these aspirations which the Crown subsequently failed to honour¹⁰.

The township was not only set to secure Muaūpoko economic well-being, but also reflected the tribe's vision of a prosperous bicultural Horowhenua community, based on partnership and reciprocity. This desire endures to this day despite past events that have alienated iwi from their turangawaewae (land) and freshwater taonga.

It is anticipated that the Tara-Ika subdivision will deliver housing and educational opportunities for Māori, as well as partnered management of parks and reserves. Muaūpoko must be considered partners in all aspects of the development.

4.4 Wāhi tapu and Tara-Ika

The site of the proposed growth area and its environments were not cultivated or occupied permanently, nevertheless, the area was a part of a larger integrated complex of seasonal food gathering areas involving both the forest and waterways. It was traversed by trails, contained clearings for temporary camping and was an area of refuge in time of war. Fortunately, a number of Muaūpoko sites in or near the proposed development have been described in reasonable detail by G. Adkin in his 1948 publication. It is highly likely there are a range of archaeological sites within the landscape that have not been recorded. The earthworks monitoring and accidental discovery process will be critical to ensure Muaūpoko relationship with their ancestral lands is provided for. Adkin's descriptions of these sites, augmented by other available evidence, are summarised in a following section.

4.4.1 Arapaepae

Ara-paepae (which means "the track across") was a trail that crisscrossed the the Ara-paepae ridge and was located southeast of the proposed development. This trail, leading from Lake Horowhenua to the Tararua Range, was used by Muaupoko bird-snaring parties and those gathering hinau berries, hinau bark for manufacturing dye, and aruhe (edible fern root). This trail

¹⁰ D.A., Armstrong (2021). *Muaūpoko Origins, Rohe, Customary Interests and Sites of Significance*. History Works: New Zealand.

is said to have been first marked out by the ancestor Haere-Tu-Te-Rangi.¹¹ It is a highly valued spiritual pathway, a pathway that Muaūpoko spirits traverse to depart into the afterlife.

4.4.2 Waiopahu Reserve

The Waiopahu Reserve is the only piece of forest remnant left from a landscape full of rangatira. It is located in the northeast section of Tara-Ika. Of particular significance are the large emergent and canopy species: pukatea rākau *Laurelia novae-zelandiae*, matai *Prumnopitys taxifolia*, totara *podocarpus totara*, rewarewa *knightia excelsa*, and tawa *Beilschmiedia tawa*. These kaumatua protect the understory and ferns layer, they anchor the epiphytes, and provide shelter and key foods for manu, moko and ngata, allowing forest creatures to thrive. The ngata *powelliphanta traversii traversii* lives within this remnant. It is a nationally endangered species, an absolute taonga and tohu (landscape marker) for Muaūpoko. The bush reserve contains a remnant population that relies entirely upon the reserve for all parts of their lifecycle.

The bush reserve has moderate issues with tradescantia weed, but of most concern is the lack of any decent predator control in an area that has critically endangered taonga. Two cats were observed roaming through the bush reserve during a site visit and only three poorly maintained bait stations were observed.

4.4.3 Te Awa a Te Tau

The main stem of the Koputaroa Stream rises from the southern tip of the Ara-paepae foothills, a little north of the proposed Plan Change area, and follows a northerly course to its junction with the Manawatū River. In former times the course of the river from its source to the confluence of its tributary, was known as Te Awa a Te Tau ('the stream of Te Tau').¹²

Te Awa a Te Tau was an important source of tuna (eel), koura (freshwater crayfish) and kākahi (freshwater mussels). These species were still being caught in the stream by Muaūpoko during the 1920s. There are numerous remains of umu (ovens) and kākahi middens located along the length of the stream and its tributaries, and within its immediate vicinity¹³.

A tributary of Te Awa a Te Tau runs through the Waiopahu Bush reserve. A week of rain preceded the recent site visit and the water was cloudy as a result of sedimentation. Overall though, the stream maintains a meandering character with cobbles and gravels clearly visible. There are also

¹¹ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 139: J. Proctor. *Summary to Accompany Sites of Significance Map Book*. November, 2015. Wai 2200 #A183a.

¹² G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 144.

¹³ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 144.

giant pukatea trees overhanging the stream banks which provide excellent habitat for freshwater taonga, and all culverts observed within the wider vicinity had good fish passage.

4.4.4 Maunu Wahine

Before European settlers modified the Horowhenua landscape, most of the land surrounding Lake Horowhenua was heavily forested. Maunu Wahine ('the women's place of refuge') was a natural open glade in the forest surrounding the base of a large-forked rimu tree. This refuge was located near the Waiophe Reserve and Te Awa a Te Tau tributary, and they provided wai Māori (drinking water) tuna (eels) and shellfish for consumption. This was known to be an early established place of refuge along one of the ancient pathways traversing the Tararua Range from East to West. It was a place where people could rest and also a place where the study of Rongoa took place. Adkin suggests that this was possibly the remotest of several refuge sites east of the lake. Richard Johnson, a pioneer sawmiller, came across this site in 1891 and saw the remains of umu.¹⁴ Maunu Wahine (and other sites discussed in this report) is marked on Adkins' map (Figure 4). The site is within the proposed growth area.

Maunu Wahine is visited by Muaūpoko women to this day where they feel a spiritual peace and sense of place and connection while on the site, including g the collection of Rongoa in the nearby Waiopehu Reserve.

4.4.5 Wai Maire

An intermittent stream known to Muaūpoko as Wai Marie ('the water of peace') was connected to Maunu Wahine and flowed along what is now Queen Street East.¹⁵ Lidar information however does not reveal any contemporary evidence of a possible waterway. The waterway was possibly destroyed at the time Queen Street was built. Alternatively, Wai Marie could have flowed intermittently along the existing pathway linking Waipunahau to Maunu Wahine in times of heavy rain only (pathway described in the following section).

¹⁴ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 238.

¹⁵ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 395.

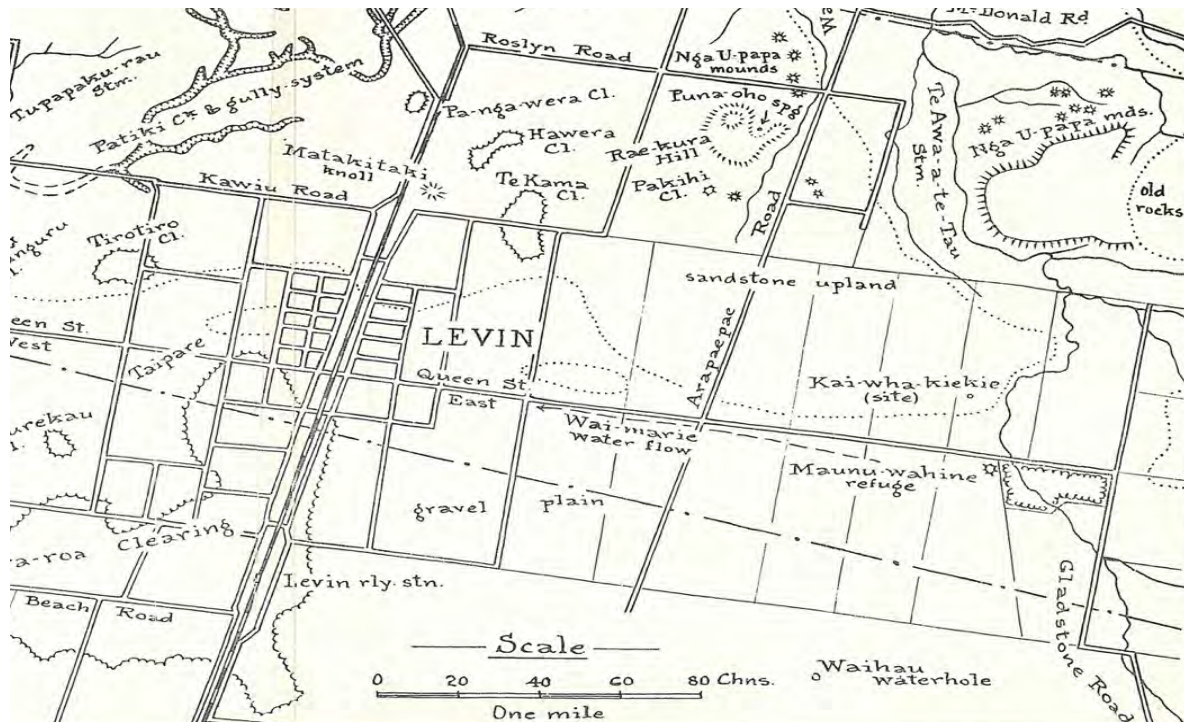


Figure 3: From G. Adkin. *Horowhenua: Its Maori Place-names and Their Topographic and Historical Background*. Map VII.

4.4.6 Wai hau, Puke tawai, Otahinga

Wai hau, a natural depression, was a renowned source of freshwater within an otherwise waterless area. It was located a little south of Maunu Wahine. Wai hau was originally surrounded by dense mātai forests. It was subject to widespread forest clearance and the conversion of surrounding land to pasture, although Adkins notes it was still filling and emptying in 1948¹⁶. It is unknown where precisely Wai hau is within the growth area, it may or may not have been completely destroyed in resulting years by agriculture.

A reference to Wai hau was made by the Muaūpoko/Ngati Apa chief Kawana Hunia Te Hakeke during the Horowhenua Block title adjudication in 1873. He told the Native Land Court that Wai Hau and Otahinga were places “where we obtained hinau berries and caught birds - we lived at these places when employed thus up to the present generation”.¹⁷ Otahinga is near Wai hau.¹⁸ Puke-tawhai, which can be translated as the hill of the tawhai (*beech sp.*) lies on elevated ground just south of the Wai-hau waterhole. It was a lookout, rendezvous and camping place.

¹⁶ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 283.

¹⁷ Otaki MB #2. 9.

¹⁸ ML Plan 4903.

A trail ran from Lake Horowhenua through the bush via Maunu Wahine, Wai Hau waterhole to Otahinga and Puke tawhai. Kereru were caught by those crossing this trail.¹⁹ The trail cannot now be located with any certainty but it is within the Tara-Ika landscape and is considered an archaeological and wāhi tapu site by Muaūpoko.

4.4.7 Kai Wa Kiekie

Kai wha kiekie is located to the north of Manu Wahine, outside of the growth area. This was a place where kiekie was gathered. Kiekie (*freycinetia banksii*) had many uses and traditionally both the flower flower (tawhara) and fruit (tirori) were eaten. The roots were used in the manufacture of canoe lashings, sails, fish and eel traps, and as whare (house) wall coverings.²⁰ Kiekie can be found within Waiopahu and Muaūpoko believe these individuals have close whakapapa links to the individuals that once existed with Kai wha kiekie.

4.4.8 Taonga

Two further bush blocks exist within the growth area, they are home to the Ornate Skink (*ligosoma ornatum*, At Risk – Declining). Mokokoko (lizards) are seen by Muaūpoko as an omen, guardians or kaitiaki associated with Muaūpoko spiritual pathway. Their habitat will be impacted as part of the development of the growth area through the introduction of predators such as house cats in much higher abundance within the landscape, as well as increased recreational use of the parks and reserves surrounding Tara- Ika.

The bush blocks also contain taonga to Muaūpoko such as kawakawa (*Piper excelsum*), tītoki (*Alectryon excelsus*) and karaka (*corynocarpus laevigatus*). These notable taonga and taonga habitat are not necessarily protected by the Horizons One Plan as most areas do not meet the schedule F habitats of significance criteria.

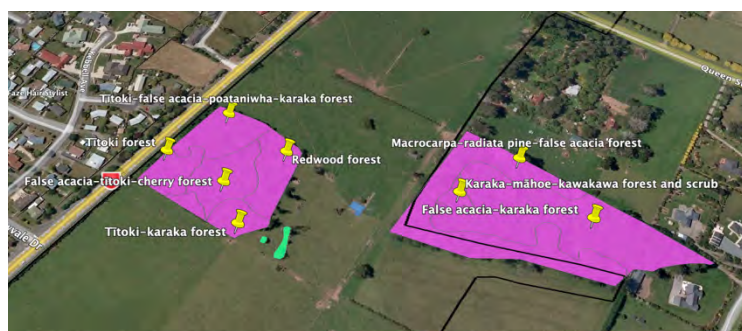


Figure 4: Queen Street East bush blocks.

¹⁹ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 319-320.

²⁰ G. Adkin. *Horowhenua: its Maori Place-names and their Topographic and Historical Background*. 1948. 172.

5 Muaūpoko Values

The Muaūpoko Tribal Authority Cultural Values Assessment²¹ and MTA Submission 35²² have formed the core basis of this report. The texts are quoted extensively in the Table 4 discussion of Muaūpoko values below to build a robust narrative and support the assignment of a value classification that is: Very High, High, Moderate, Low and Negligible. The assignment of values and their class has also been reviewed by MTA technical advisory team.

Muaūpoko have focused on communicating iwi kaupapa (topics) of high importance through these early documents, leading to many values being rated as High or Very High. These values are critically important to iwi and include:

- **wai** (freshwater)
- **taonga species** (ornate skink and native endemic snails)
- **mahinga kai, raranga and rongoa**,
- **wāhi tapu** (Maunu Wahine, spiritual pathways and bush reserves).

Table 4: Cultural Values Assessment.

Values	Assessment Criteria	Discussion	Value Class
Muaūpoko worldview	Connection to atua (ancestors with supernatural qualities related to the environment) and the wider environment	The proposed growth area is connected to Punahau and the moana by the movement of wai through the landscape. "Punahau is a taonga of inestimable importance to Muaūpoko."(p3) "Our whenua has been dramatically changed and damaged....These effects are cumulative and have built to the point where Punahau is now one of the most polluted lakes in Aotearoa. There are concerns our waterways may be near, or at, tipping point beyond which recovery will be possible."(p5)	Very High
		"Tararua is represented in the Muaūpoko pepeha, 'ko Tararua te pae maunga'. The range provides protection, connections, spiritual and practical sustenance"(p3). "The Range also provided connection to kin in other parts of the country."(p3) "We are concerned that there is potential for urban development.....interrupting the connections and view path from the maunga to Punahau and onwards to the moana."(p9)	Moderate
	Muaūpoko whakapapa (genealogical connections to Muaūpoko ancestors and the environment)	"The Muaūpoko name bestowed on the project is Tara-Ika. Tara was a Muaūpoko tupuna of great vision and reverence, a leader."(v3) The name recognises the proposed development sits at the feet of the Tarara Ranges and that it of great importance to Muaūpoko people who gifted the name to signify this deep attachment and intention of kaitiakitanga over the life of Tara-Ika	High

²¹ Muaūpoko Tribal Authority (2020). *Cultural Values Report: For the Proposed Gladstone Green Development*.

²² Di Rump on behalf of Muaūpoko Tribal Authority (2021). Proposed Plan Change 4: *Tara Ika Growth Area, Submission 35*. Retrieved from <https://www.horowhenua.govt.nz/files/assets/public/districtplan2015/ppc4/proposed-plan-change-4-taraika-growth-area-full-copy-of-submissions-pages-190-to-226.pdf>

		<p>planning, development and ongoing monitoring and maintenance.</p> <p>“Our customary rights and interests (through whakapapa)....intersect with Ngāti Apa, Rangitāne and hapū of Ngāti Kahungunu, with the lands in the Horowhenua district becoming Muaūpoko heartland including private ownership of Lake Horowhenua.”(p2)</p> <p>Muaūpoko are the only mana whenua group within the growth area.</p> <p>“The proposed growth area is located within an area which our people have worked, cultivated, hunted and gathered resources from over 1000 years. It is quite likely that construction will uncover artefacts, sites of archaeological significance or possible Tangata Koiwi (human remains).”(p6)</p>	
Kaitiakitanga	The mauri (life force) of the area	<p>“Muaūpoko have occupied Horowhenua and exercised kaitiakitanga and rangatiratanga over the land, lake and associated natural resources without interruption since the time of our ancestors to the present.”(p3)</p> <p>“Muaūpoko has an obligation to care for, protect and enhance the mauri of natural resources in our rohe, for the benefit of ourselves, others living in the region, and for future generations.”(p5)</p> <p>“However, our ability to give effect to this obligation has been constrained by the actions and omissions of the Crown and other parties.”(p5)</p>	High
	Ngā wai ora (clean/healthy fresh water)	<p>“The relationship with waterways lies at the heart of mana whenua physical, spiritual and cultural wellbeing.”(c15)</p> <p>“Protection of our waterways and lakes (and species they support) from further harm is of utmost importance to us.”</p> <p>Te Awa a Te Tau and the Horowhenua groundwater is a significant waterway associated with the growth area.</p>	Very High-High
	Taonga species and habitats. Consideration of lifecycles, daily or seasonal availability of habitat and utilisation	<p>Waiopahu Bush Reserve is a threatened habitat forest type and contains the Nationally Endangered ngata (<i>powelliphanta traversi traversi</i>)²³. The Queen Street East bush blocks contain the Ornate Skink (<i>ligosoma ornatum- declining at risk</i>). These taonga populations are wholly reliant on the health of these single isolated forest patches.</p> <p>“We are concerned that the growth area will disturb the habitat of rare and endangered species of native snails that are endemic to the Horowhenua. Disturbance will threaten these taonga from the region.” (p6)</p>	Very High
		<p>“The entire area of the foothills to Punahau was lush with flora and fauna and known for its abundant and vigorous birdsong....Customary use of the Tara-Ika area included fishing, birding, gathering hua rākau (plant material), harvesting harakeke and kiekie for raranga (weaving)...(and other species) for rongoa.”(p3)</p> <p>The Queen Street East bush blocks contain taonga to Muaūpoko such as kawakawa (<i>Piper excelsum</i>), tītiki (<i>Alectryon excelsus</i>) and karaka (<i>corynocarpus laevigatus</i>).</p>	Moderate

²³ Horizons Regional Council One Plan Schedule F: Indigenous Biological Diversity.

	Manaakitanga: Muaūpoko priorities for protection	<ul style="list-style-type: none"> Stormwater discharge quality and quantity Discharge of water from construction activities Avoidance and disturbance to groundwater flows and artesian springs as a result of urban development" (p6) Protection of ngata within Waiopahu Bush Reserve 	Very High
Rangatiratanga	Traditional lands, sites and villages	<p>"The Waiopahu Reserve....is located near the site of Maunu Wahine refuge, a clearing where Muaūpoko people could rest on their journeys to the ranges and to east and back. The trails followed from one coast to the other and over the Tararua Ranges included this (growth) area and were part of the spiritual pathways that extended to the ocean."(p4)</p> <p>Evidence presented in section 4.4.6 also describes a trail within the growth area connecting Punahau, Maunu Wahine, Wai Hau and Otahinga.</p> <p>Although the lands to the east of Punahau (the growth area) were not permanently occupied, they formed a vital part of the Muaūpoko economy and were part of an integrated complex system involving both coastal and inland resources."(p4)</p> <p>Muaūpoko control over their lands throughout our rohe was progressively eroded....The Waitangi Tribunal found multiple Treat breaches in its inquiry into the Horowhenua, and other Tribunal proceedings are on-going."(p4)</p>	Very High
	Significant waterbodies including groundwater, rivers, streams, springs, wetlands and lakes	<p>"Numerous puna (springs) means that the (growth) area was plentiful in aquifers and underground rivers, corresponding to rich sources of wai and kai." (p4)</p> <p>"The most important of the dune lakes is Punahau...It is, as David Armstrong described, 'a taonga of inestimable importance to Muaūpoko' that is central to our identity and mauri. The lake sustained Muaūpoko for centuries, providing food and a vast array of resources."(p3)</p> <p>"Te Awa a Te Tau was an important source of tuna (eel), koura (freshwater crayfish) and kākahi (freshwater mussels) and was linked with Maunu Wahine".</p> <p>"Our rivers and streams have been diverted and wetlands have been drained, interrupting the passage of fish and water life and interfering with the natural clearing and cleaning functions, such as sediment trapping, filtering out nutrients, removing contaminants and maintaining water tables."(p5)</p>	Very High
	Importance of site history and key events	<p>The dense ngāhere (forest) within Tara-Ika was used as a defense system and for its rich resources. Maunu wahine was a place of spiritual sanctuary and healing particularly for wahine (women).</p> <p>"alongside the Ōtaki to Northern Levin Expressway Project...these are the most significant developments to occur in the region since the railway that arrived in the 1870s".</p> <p>"we seek further assurances that Muaūpoko stories, ancestors, and association with the whenua of Tara-Ika will be intentionally and consciously recognised through the development stages and processes such as design, and the naming of public parks and streets."(p7)</p>	Very High
	Relationship with culture, customs and behaviours	<p>"Muaūpoko people residing on the shores of the lake visited the eastern areas (the growth area) seasonally for spiritual and cultural practices and to gather resources or to cultivate cleared areas."(p4)</p>	High

Te Whare Tapa Whā	Taha Tinana (Physical health): access to Muaūpoko turangawaewae and traditional resources	<p>"Muaūpoko people....They accessed the entire region including this plan area which was essential to our way of life"(p4)</p> <p>We are concerned that destruction of these sites (wāhi tapu, lands and waterways within the growth area) will occur as a result of development.....destroying our ability to record and recover findings and links to our whakapapa. Earthworks and other construction must be subject to robust cultural monitoring protocols and accidental discovery processes agreed with Muaūpoko".</p>	High
	Taha Wairua (Spiritual Health): connection with the spiritual relam and wairua	<p>"Muaūpoko whānau would visit this area (the growth area) for reflection, respite and spiritual practices."(p4)</p> <p>"Maunu Wahine was a place of particular spiritual sanctuary and a place of healing for Muaūpoko wāhine."(p4)</p> <p>"We are concerned that there is potential for urban development within the proposed growth area to impact on our spiritual pathways from our wāhi tapu in the Tararua Range to Taitoko."(p3)</p>	High
	Taha Whānau (Family Health): Housing affordability and diversity for whānau	<p>"We recognise that the Tara-Ika growth area is in response to rising rental and ownership costs by increasing both supply and diversity of housing available in Taitoko.</p> <p>There are, for example, no policies that seek to ensure that there is sufficient provision of housing for people on low-moderate incomes (as occurs in the Auckland Unitary Plan), provision of community affordable housing (as in Queenstown-Lakes District Plan,) or other opportunities to progress into home ownership and security for our people."(p7)</p> <p>Muaūpoko see the best way to protect these outcomes is through full participation, including expression of their cultural values and connections to the historic, contemporary and future use(s) of the land.</p>	Moderate
	Taha Hinengaro (Mental Health): importance to Muaūpoko identity	<p>"This is the heartland of our rohe and has immense spiritual and physical significance to us. Our identify and wellbeing are inextricably linked with the whenua, the maunga and the lakes and waterways in this (growth) area"(p3).</p> <p>"Customary uses (and activities) were important to the physical and spiritual identity of Muaūpoko".</p>	High

6 Effects Assessment

6.1 Construction phase effects

For the Tara Ika growth area, the MTA technical advisory team have identified the following potential and actual adverse effects during the construction phase:

1. Release and deposition of fine sediments – the potential adverse effect of construction zone runoff transporting fine sediments to adjacent waterways, where they may reduce water clarity and increase deposited fine sediment concentrations having negative impacts on the relationship of Muaūpoko and their taonga species, the mauri of wai and the wellbeing of Muaūpoko.
2. The destruction of traditional sites and their values – the potential adverse effects from construction activities on known and unknown archaeological sites, spiritual and cultural places, pathways, the relationship of Muaūpoko and their taonga species.

3. Incursion by other iwi in Muaūpoko heartland – the potential for other iwi to claim they have traditional rights within Tara Ika growth area and assert their presence, impacting Muaūpoko identity and their cultural and traditional rights as mana whenua through their whakapapa.
4. Disturbance and destruction of overland flow pathways and soakage areas – the unavoidable, actual adverse effect of disturbance to existing surface water overland flow pathways as a result of earthworks in construction zones, disrupting natural processes such as groundwater recharge, cleansing of wai, the recharging of the mauri and spiritual life force of wai and whenua.
5. Destruction of traditional lands – the unavoidable, actual adverse effect of earthworks and the spiritual impact on the wairua within the landscape.

The magnitude of adverse effects during both construction phase (Table 5) and operation phase (Table 6) are described. The assessment compares the magnitude of effect both with and without effects management actions.

Table 5; Magnitude of Construction Phase Effects

Activity/Effect	Magnitude WITHOUT effects management	Reasoning	Effects Management Actions relevant to Tara Ika Plan Change	Magnitude WITH effects management
Construction Effects				
Release and deposition of fine sediments Level of confidence: High Spatial scale: Potential to effect Waipunahau, Te Awa a Te Tau and the Ohau River. Duration: Construction Phase Reversibility: Yes in stream environments. No in Waipunahau Timing: Potential to impact fish migration and spawning; Muaūpoko access to freshwater resources; reverse efforts to reduce sediment discharges to Waipunahau.	High-low	<p>Large scale earthworks are unavoidable in growth areas of this scale and all earthworks have an inherent risk of creating sediment laden runoff that may enter adjacent waterways. The Tara-Ika growth area will build approximately 3500+ new lots, downstream environments include Te Awa a Te Tau Stream and Punahau.</p> <p>The deposition of sediment on the bed of aquatic habitats (at rates and with quantities of smaller particles greater than the natural state) is a major stressor on waterway ecosystems through altering physical habitat (clogging interstitial spaces in the stream bed used as refugia by fish and invertebrates), altering food resources (e.g., smothering algae), and degrading sites used for egg laying by many aquatic species. Sedimentation can also reduce the aesthetic and recreational values associated with wai. The mauri of the environment and the wellbeing of mana whenua is connected to all of these processes.</p> <p>The magnitude of effect differs among sites depending on the type of receiving environment and existing bed substrate composition, and extent of earthworks within the catchment.</p>	<p>Significant waterbodies are mapped including:</p> <ul style="list-style-type: none"> - Punahau; - Te Awa a Te Tau; - Overland flow pathways within the Horowhenua gravels. <p>Any earthworks over 250m² should trigger a District Council consent application within Tara-Ika and the opportunity for Muaūpoko to become an affected party if they have concerns about the impact of construction on their significant waterbodies.</p> <p>Discretion should be provided to Muaūpoko to consider the impact on the values associated with each of these sites including the effect the activity may have on Muaūpoko values and their attributes.</p> <p>Including means to avoid, remedy, mitigate or compensate for any potential or actual effects.</p> <p>Enabling kaitiakitanga is an effective way to minimise impacts on the cultural environment and mana whenua.</p>	Moderate to negligible

<p>Destruction of traditional sites and their values</p> <p>Level of confidence: Low-High</p> <p>Spatial scale: highest number of traditional sites where location is known are in the north of the development, adjacent to Queen St East. High likelihood of uncovering sites adjacent to traditional pathways and clearings/waterholes that traversed Tara Ika (unknown locations).</p> <p>Duration: Topsoil stripping.</p> <p>Reversibility: No.</p> <p>Timing: Earthworks season often Spring-autumn.</p>	<p>Very High-High</p>	<p>Traditional knowledge, supported by early settler records, confirms the presence of significant sites within the landscape. Some of these sites are zoned as open space for their recreation values (Waiopahu Reserve and Maunu Wahine), others such as Muaupoko spiritual pathway and Queen Street East bush remnants are zoned residential.</p> <p>Based on mana whenua and the authors experience in other projects, middens and ovens are the most likely types of archaeological sites to be accidentally uncovered, they can occur at a high frequency in cultural landscapes and could be found anywhere throughout the Tara-Ika growth area.</p>	<p>Sites are mapped to identify known sites of significance to Muaupoko including:</p> <ul style="list-style-type: none"> - Maunu Wahine - Wai Maire spiritual pathway - Waiopahu Reserve - The two Queen Street East bush remnants. <p>When any project takes place within, adjacent to or may affect the sites contained within the planning map, Muaupoko are provided with the consent application and have the ability to become an affected party.</p> <p>Stormwater and earthworks treatment devices should not be located within significant sites.</p> <p>Any subdivision, commercial development or infrastructure project within the growth area should be required to adhere to Muaupoko Accidental Discovery Protocol as a condition of consent to be supplied in supplementary information.</p> <p>Discretion should be provided to Muaupoko to consider the impact on their values associated with each of these sites including:</p> <ul style="list-style-type: none"> - the effect the proposed activity may have on taonga species and their habitat; - the effect the activity may have on Muaupoko values and values attributes; - the design, layout, connectivity, and provision of land for open space; - the effects on archaeology and historic sites. <p>Including means to avoid, remedy, mitigate or compensate for any potential or actual effects.</p>	<p>low</p>
<p>Incursion by other iwi in Muaupoko heartland</p> <p>Level of confidence: High</p> <p>Spatial scale: Across discrete projects within Tara Ika.</p> <p>Duration: Construction phase and on-going</p> <p>Reversibility: Yes</p> <p>Timing: At any stage</p>	<p>High</p>	<p>Muaupoko have been subject to a flawed and inaccurate narrative that they were conquered, and do not have rights to their traditional lands, sites and waterways.</p> <p>Other larger iwi are consistently trying to encroach on Muaupoko heartland through resource management processes.</p>	<p>Muaupoko should be referenced directly in the Plan Change objectives and policies rather than 'iwi or hapū', 'cultural', 'Māori' or 'mana whenua'.</p> <p>Muaupoko identity should be protected and enhanced by the use of Muaupoko names in reserves and roads, through the incorporation of local history and signage within reserves and shared use pathways. Muaupoko wish to create a culture where the Tara-Ika community appreciates and learns about their values.</p>	<p>Positive</p>
<p>Disturbance and destruction of overland flow pathways and soakage areas</p> <p>Level of confidence: High</p> <p>Spatial scale: Relevant to the entire growth area</p> <p>Duration: Construction phase</p>	<p>Very High</p>	<p>The Tara Ika growth area is largely devoid of any permanent waterways, except Te Awa a Te Tau (within Waiopahu Reserve) in the north-eastern corner, set aside as open space. The Horowhenua gravels are highly porous, the upper 0-5 meters is often more saturated, while the lower 5-10meters drains quickly to deep groundwater (in a matter of hours-days) and the lake (months to years).</p>	<p>Erosion and sediment control, stormwater soakage pits and wetlands should be co-located where possible, replicating the process of recharging groundwater to protect the cultural values associated with their natural functioning.</p> <p>They should be designed to minimise disruption to natural surface water-groundwater interactions.</p>	<p>Moderate</p>

Reversibility: No Timing: During construction phase		Construction will disturb this upper layer of saturated soils and the overland flow pathways that form in heavy rainfall events. These pathways are connected to soakage areas and surface waterbodies including Punahau. Disturbance or destruction of overland flow pathways and soakage areas will affect the natural processes and cycles of wai within the Tara-Ika landscape, their potential for cultural revival and enhancement will be irrevocably lost. Muaūpoko will feel a spiritual loss related to the diminishment of the wairua (spiritual realm) in the landscape.	Activities should be designed considering effects to quantity and quality of the downstream environment.	
Destruction of traditional lands Level of confidence: High/unavoidable Spatial scale: Relevant to the entire growth area Duration: Construction phase Reversability: No Timing: During construction	Very High	The Horowhenua Block is Muaūpoko heartland, connected to their spiritual health and identity. The transformation of the landscape to agriculture has had a immeasurable impact on the health and wellbeing of the iwi, this further transformation will create upheaval in the relationship Muaūpoko hold with the landscape.	Muaūpoko must be enabled to participate in the design of subdivision and open space and oversee construction to ensure their traditional lands are treated in a manner aligned with Muaūpoko values and their tikanga. Muaūpoko are supported to develop a comprehensive open space design guide. Muaūpoko Accidental Discovery Protocol is a condition of consent.	Moderate

6.2 Operational Effects

For the Tara Ika growth area, , the MTA technical advisory team have identified the following potential and actual adverse effects during the operational phase:

1. Stormwater discharges – the potential adverse effects of stormwater runoff from the growth area to alter water quality and water quantity in receiving environments, effects on significant waterbodies, the relationship with Muaūpoko traditional resources, culture, customs and behaviours.
2. Increasing predation on taonga species – the potential for taonga species such as the ngata (*powelliphanta traversi traversi*, Nationally Endangered) and the Ornate Skink (*ligosoma ornatum*, At Risk – Declining) to suffer higher predation levels and threats to their persistence through the introduction of human companions such as cats and dogs to the landscape. Muaūpoko identity and spiritual health are intertwined with the health of these taonga.
3. Increasing weed invasions within taonga habitat – the potential for garden escapees to invade areas valued for the cultural and ecological characteristics, resulting in impacts on Muaūpoko relationship with their taonga species and Muaūpoko priorities for protection.

4. Muaūpoko are not able to participate in the Tara-Ika development – the potential for Muaūpoko to be excluded from implementing their values in the design and implementation of Tara-Ika.
5. Light pollution – the actual, unavoidable adverse effect of introducing artificial light to the landscape for both safety reasons and residential uses. Effects on ecological areas such as Waiopahu Reserve and the two bush along Queen Street East include disruption of night creatures can confuse and alter the natural behaviours of various taonga including insects, birds, fish, reptiles, and amphibians. Effects on areas of spiritual significance such as Maunu Wahine and the pathway from Waipunahau to te pae maunga Tararua alter the natural light characteristics of the areas. Muaūpoko priorities for protection are related to these interactions.
6. Increase in use and access of cultural sites – the actual unavoidable effects from urban development and the increase in amount of people that will access Muaūpoko wāhi tapū.

Table 6: Operational Effects

Activity/Effect	Magnitude WITHOUT effects management	Reasoning	Effects Management Actions relevant to Tara Ika Plan Change	Magnitude WITH effects management
Operational Effects				
Stormwater Discharges (quality and quantity) Level of confidence: High Spatial scale: Potential to effect downstream habitats Duration: Permanent Reversibility: No Timing: On-going	Very High-moderate	<p>Stormwater from roads and urban environments generally contain numerous contaminants such as metals (e.g., Cu, Zn), hydrocarbons, fine sediments and microplastics. Such contaminants can have adverse effects on biota, especially in streams that have a high proportion of pollution sensitive species or in environments that are on the edge of irrevocable change.</p> <p>Perturbation of flow regime through urban development and increases in hard stand surfaces has the potential to enhance instream erosion and scouring and impact aquatic animals.</p> <p>Punahau receives untreated stormwater from a large area of Levin which causes adverse effects on the health of the lake.</p>	<p>The stormwater design philosophy is to use a treatment train approach to treat and detain stormwater using soak pits and large constructed ponds and wetlands. For smaller rain events, soak pit infiltration will be the main disposal method, while larger events, including roadway water will be captured and treated in centralised systems.</p> <p>The design approach must incorporate Muaūpoko values.</p> <p>Stormwater management systems should be designed, constructed and operated to avoid adverse hydrological effects on significant waterbodies and their values</p> <p>Stormwater management systems are designed, constructed and operated to avoid adverse effects of sedimentation, heavy metals, hydrocarbons and microplastic contamination on significant waterbodies and their values</p>	Low-negligible
Increase in predation of taonga species Level of confidence: High Spatial scale: Limited to 3 remaining bush remnants Duration: Permanent	Very High	<p>Cats and dogs occur in urban environments in much higher densities than rural environments. Cat predation in particular has a relatively higher impact in new subdivisions near ecological and cultural areas that have not been subject to these threats previously.</p>	<p>Implement a pest species management program to reduce overall predation levels, this will compensate for some higher levels of predation by urban predation effects</p> <p>Where new lots are created, ensure a 500 meter buffer around Waiopahu Bush remnant and Queen Street East remnants where cats are not permitted by new home owners²⁴.</p>	Moderate-low

²⁴ Metsers, Seddon & van Heezik (2009). Cat exclusion zones in rural and urban fringe landscapes: how large would they have to be? *Wildlife Research* 37(1) 47-56

<p>Reversibility: No</p> <p>Timing: Development</p>		<p>Cats display avoidance of open areas with little cover, preferring the cover of trees and buildings. Queen Street East bush and Waiopahu Reserve will therefore be vulnerable.</p> <p>Despite subsidised feeding by owners, urban areas likely have a higher level of offtake of susceptible prey species.</p>		
<p>Increasing weed invasions within taonga habitat</p> <p>Level of confidence: High</p> <p>Spatial scale: Limited to 3 remaining bush remnants</p> <p>Duration: Permanent</p> <p>Reversibility: Yes</p> <p>Timing: Development</p>	Moderate-low	<p>A range of common environmental weeds were once garden escapees, increasing urbanisation in rural areas around ecological sites increases risk ornamental plants will naturalise in the wild. Muaūpoko values are associated with the ecological health and presence of taonga within Waiopahu and Queen Street East Bush Remnants.</p>	<p>Queen Street Bush remnants are protected by:</p> <p>Installing a 30m perimeter buffer planting with locally sourced indigenous tree species</p> <p>Infill planting is undertaken with locally sourced indigenous tree species</p>	Negligible-Positive
<p>Muaūpoko are not able to participate in the Tara-Ika development</p> <p>Level of confidence: High</p> <p>Spatial scale: Subdivision wide</p> <p>Duration: Temporary-long term</p> <p>Reversibility: Yes</p> <p>Timing: Development</p>	Very High	<p>Developments are undertaken for many years after a plan change is undertaken. If adequate engagement with tangata whenua and provisions that protect their rights to participate are not provided for at this stage then they can become largely locked out of future processes and activities.</p>	<p>Muaūpoko are enabled to participate in the design of subdivision, infrastructure and land development to ensure significant sites, waterbodies, features, and their cultural values and attributes, are protected.</p> <p>Muaūpoko have the ability to become an affected party if council and developers do not appropriately manage cultural effects.</p>	Positive
<p>Light Pollution</p> <p>Level of confidence: High – unavoidable effect of urban development.</p> <p>Spatial scale: The entire Tara Ika area</p> <p>Duration: Permanent</p> <p>Reversibility: No</p> <p>Timing:</p>	Moderate	<p>Artificial lighting is required to support urban activities.</p> <p>Light emitted from indoor and outdoor sources can cause adverse effects on the brightness and clarity of the night sky and can confuse and alter the natural behaviour of various biota including insects, birds, fish, reptiles, and amphibians.</p> <p>The effect differs among sites depending on habitat availability and proximity to proposed areas with artificial lighting.</p>	<p>The light colour temperature, shielding and hours of operation of outdoor artificial lighting should be managed to mitigate skyglow to protect the clarity and brightness of the night sky.</p> <p>Promote the use of streetlighting with a colour temperature of 3000 Kelvin or lower, shields and other devices to direct light downwards.</p>	Low
<p>Increase in use and access of cultural sites and traditional lands</p>	High-low	<p>Muaūpoko lands and significant sites will be accessed by whole communities into the future and could be designed and used in a way that is not in line with Muaūpoko values and tikanga.</p>	<p>Muaūpoko are supported to develop a comprehensive open space design guide.</p> <p>The Masterplan should be amended to provide a larger reserve area for the preservation of Maunu Wahine, the 30m area traversed by the Shared Use Path is not large enough for Muaūpoko values to</p>	negligible-Positive

			<p>be expressed to a sufficient degree, furthermore a larger area should be set aside to ensure the exact historic location of Maunu Wahine is captured in the new reserve.</p> <p>Views towards the Tararua Ranges are maintained along Queen Street East through the use of setbacks, low fencing and vegetation management.</p>	
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7 Conclusions and recommendations

The growth area will create a cultural environment significantly different to the current baseline. It is expected that such large scale changes within the landscape will have adverse effects on Cultural Values, however this report has demonstrated there are a range of means available to ensure effects on cultural values are avoided, minimised and in some cases a net gain in value can be achieved (see Overall Level of Effects in Table 7). Muaūpoko have a strong desire to find solutions which protect cultural values while supporting the needs of their community. This was the intent of the gifted name Tara-Ika, Muaūpoko look forward to walking alongside council as Treaty Partners as we move through to the development and implementation of the Plan Change.

Table 7: Overall level of effects

Activity/Effect	Cultural Value	Magnitude WITH effects management applied	Overall Level of Effect
Release and deposition of fine sediments	Very High- High	Low-negligible	Moderate-very low
Destruction of traditional sites and their values	Very High- High	Low	Moderate-low
Incursion by other iwi in Muaūpoko heartland	High	Positive	Net gain
Disturbance and destruction of overland flow pathways and soakage areas	High	Moderate	High
Destruction of traditional lands	High	Moderate	High
Stormwater Discharges (quality and quantity)	Very High-High	Low-negligible	Moderate-very low
Increase in predation of taonga species	Very High	Low	Moderate
Increasing weed invasions within taonga habitat	Very High	Negligible-positive	Low-net gain
Muaūpoko are not able to participate in the Tara-Ika development	Very High	Positive	Net gain

Light Pollution	Very High	Low	Moderate
Increase in use and access of cultural sites and traditional lands	Very High- moderate	Negligible-positive	Low-net gain

Recommended actions include:

- 1) Amend Plan Change 4 Objectives and Policies to ensure Cultural Effects Management Actions are undertaken during subdivision and development;
- 2) Amend Plan Change 4 Rules to ensure matters of significance to Muaūpoko can be considered as 'Matters of Discretion' and Muaūpoko have the opportunity to be considered an affected party;
- 3) Amend the Masterplan to reflect Muaūpoko Open Space requirements for Maunu Wahine;
- 4) HDC support the development of a Memorandum of Understanding between the council and MTA that details the way in which the two entities will work together for the life of PC4;
- 5) HDC support the development of a Open Space Design Guide in partnership with MTA.

Disclaimer

We have used various sources of information to write this report. Where possible, we tried to make sure that all third-party information was accurate. However, it's not possible to audit all external reports, websites, people, or organisations. If the information we used turns out to be wrong, we can't accept any responsibility or liability for that. If we find there was information available when we wrote our report that would have altered its conclusions, we may update our report. However, we are not required to do so.

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Prepared by:

Siobhan Karaitiana

BSc (Honours) Ecology

Kaupapa Taiao Specialist

VERSION	DATE	AUTHOR	REVIEWER	COMMENTS
1	1 October 2021	Siobhan	Vanessa Tipoki	Peer review and recommended changes to report.
2	4 October 2021	Siobhan	Di Rump	Full review and recommended changes to report
3				
4				