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14/07/2025

MAHI ROAD 40, HELENSVILLE

INFRASTRUCTURE REPORT - PRIVATE PLAN CHANGE

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Mahi Road 40, Helensville | Infrastructure Report - Private Plan Change

Dear Richard,

Thank you for the opportunity for Civix to provide an Infrastructure Report - Private Plan Change for Mahi Road 40, Helensville.

This report and appendices detail the required infrastructure to support the Private Plan Change and Rezoning of Mahi Road 40, Helensville.

Please do not hesitate to contact us if you have any questions on this report.

Written By:

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Contents

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Drawing Series/Number	Description
CIV-EX-ZON-001	Existing Zoning Plan
CIV-PR-ZON-001	Proposed Zoning Plan
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30000 Series	Cut Fill Plan
58000 Series	Flooding Model Results – Plan
58500 Series	Flooding Model Results – Sections
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62100 Series	Wastewater Capacity Table

Appendices:

Appendix A - Watercare early engagement correspondence

Appendix B - Healthy Waters early engagement correspondence

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1. Executive Summary

Civix Ltd is a Planning, Surveying and Engineering company assisting Hounslow Holding Ltd with a proposed Private Plan Change Application (the "application") under the *Auckland Unitary Plan Operative in part (13 September 2024)*, referenced as the "AUP". The land subject to this application is located at 40 Mahi Road, Helensville.

The proposal is to seek a Private Plan Change to rezone the land within the identified site, from Future Urban Zone to a combination of predominantly Single House Zone (SHZ), Mixed Housing Suburban Zone (MHSZ) and Countryside Living Zoned (CLZ) land. Sufficient land will be zoned for drainage reserve which may double as a recreation reserve, and public roading will be included to establish a logical and efficient street network. On the larger areas of remaining CLZ land areas of significant ecological value are identified for protection. Watercourses are specifically avoided in terms of development within them. Refer to drawing PR-MP-001 for the Conceptual Master Plan.

This report outlines earthworks, roading, stormwater, flooding, wastewater and water supply infrastructure and the necessary upgrades to support development is in accordance with the "proposed zoning amendments and Concept Master Plan". A summary of the report is outlined below:

- Soil and Rock Consultants provided a geotechnical assessment report appended to the AEE report as part of the plan change application. The report identified a number of geotechnical considerations and concluded that the site is considered to be geotechnically suitable for the extent of development enabled by the proposed plan change.
- Site specific sediment and erosion controls consistent with Auckland Councils Guideline Document 2016/005 (GD05) will be sufficient to protect the surrounding environment during Bulk Earthworks and infrastructure construction. Design and detailing of these measures will be undertaken during subsequent resource consent applications.
- The design of the roading networks will be carried out in accordance with Austroads Design Manual and the Auckland Transport's Technical Design Manual (TDM). All roads proposed will be local roads and subject to a low-speed environment (30km/h) therefore dedicated cycleways are not considered necessary.
- Existing watercourses will be retained and enhanced where considered necessary, with the stormwater network designed to maintain predevelopment flows to existing watercourses. Overland flow paths will allow conveyance of the 1 in 100 year storm event runoff, ultimately flowing to the Awaroa Stream. Overland flow will generally be channelled and contained within the public road reserves.
- Stream Hydrology- Retention (5 mm) measures should be implemented for stormwater runoff for roof areas for all dwellings via tanks or similar approved with non-potable reuse. Stormwater Retention is not feasible for public roads, COALs and driveways, therefore shall be drained into the proposed communal scale wetland for water quality treatment and detention (95th percentile). This solution has been chosen as it is the SMAF 1 specified outcome, which will achieve equivalent hydrology (infiltration, runoff volume, peak flow) to predevelopment (grassed state) levels.
- There is sufficient capacity to service the site with public infrastructure for wastewater and stormwater, which can be achieved through existing and proposed infrastructure. There is limited capacity concerning water supply therefore water tanks are to be installed for each of the proposed lots to compensate for the water demand requirements.
- Chorus and Vector have confirmed that they have available supply within the vicinity of the site to service the site for both telecoms and power reticulation systems.

2. Existing Site Description

The Plan Change Area totals approximately 17.37 hectares and is located within Helensville (refer to Figure 1 below). It is bound by CLZ properties 25, 69, 75, 141 Wishart Road to the west, Mahi Road to the North (SHZ) inclusive of the recently constructed Parkview Development and rural (CLZ) land to the south and east, noting that there is also FUZ land and Residential - Large Lot Zone land to the southeast.

Below is a table of the property affected by the Proposed Plan Change:

Table 2- Affected property(s)

Property Address	Legal Description	RT Number	Title Area	Register Owner(s)
40 Mahi Road	LOT 2 DP 586879	1164429	17.366 Ha	Hounslow Holdings

2.1. Existing Topography and Features

The site is currently vacant, consisting of large areas of grass, native and exotic scrub and bush, with watercourses and overland flow paths leading to a north-eastern catchment across Rautawhiri Road and to a contributor (Awaroa Stream) to the Kaipara River. The topography generally slopes down towards the north with an average slope of approximately 13%.

The existing manmade features mentioned below are the only items visually seen and noted during a site visit undertaken on the 07/05/24: -

- The only formalized service that was noted during site visit are overhead power lines that run up the site to properties to the south.

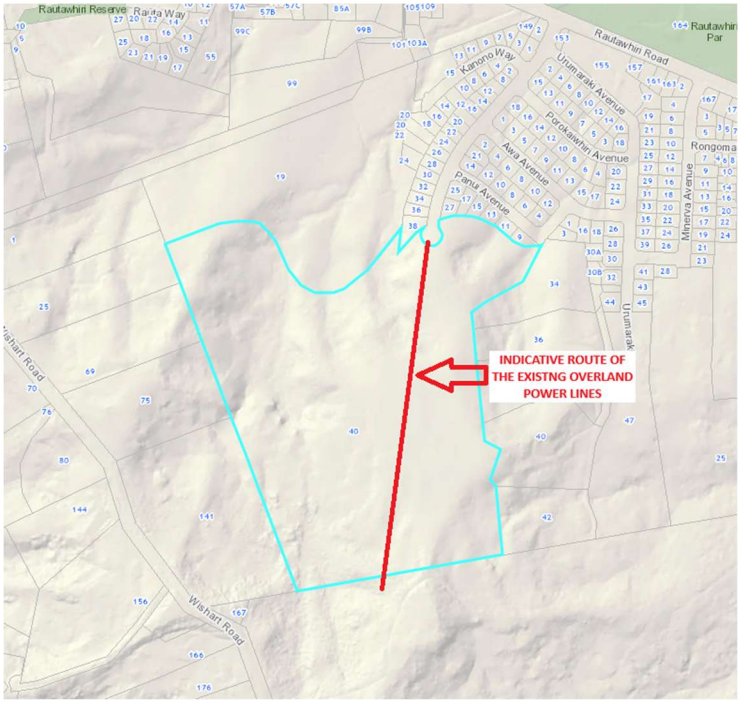

Figure 1: Existing Overhead Power Line Route

- Newly developed site known as the Parkview Development adjoins to the north-east of the subject site, the below figure has reference.

Figure 2: Recently Developed Land

The existing property has access from Mahi Road and is currently zoned as Future Urban/Country Living Zone. The zones are shown below in Figure 3 and the wider location characteristics are shown below that in Figure 4.

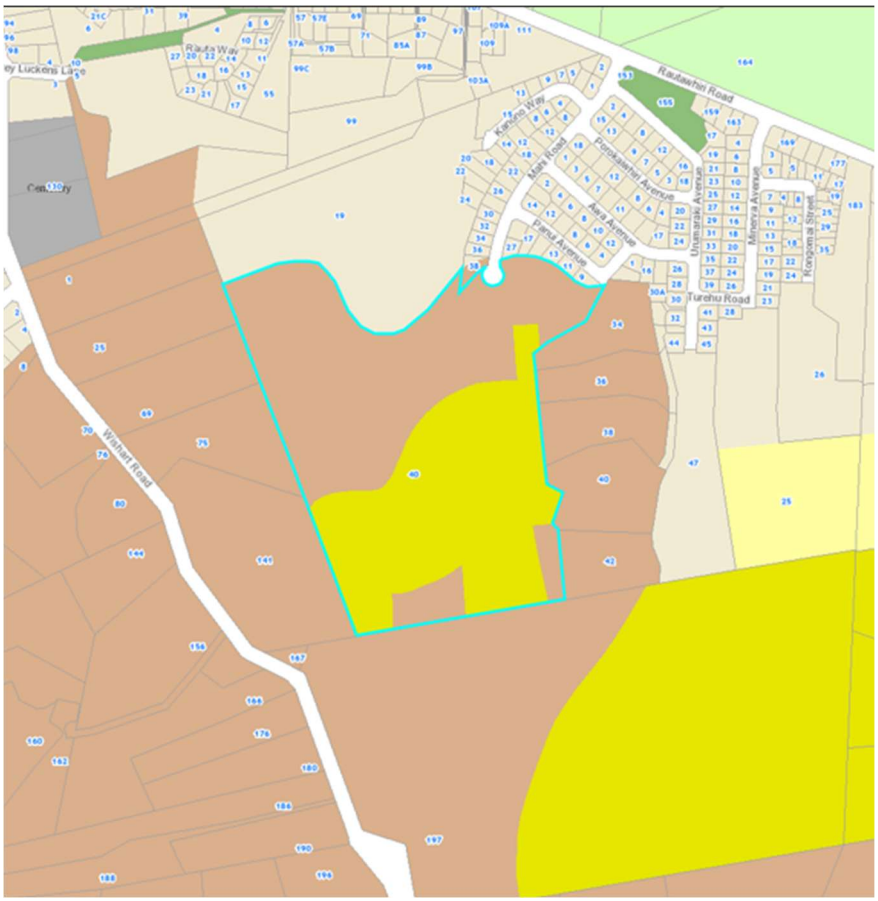

Figure 3: Site and Zoning

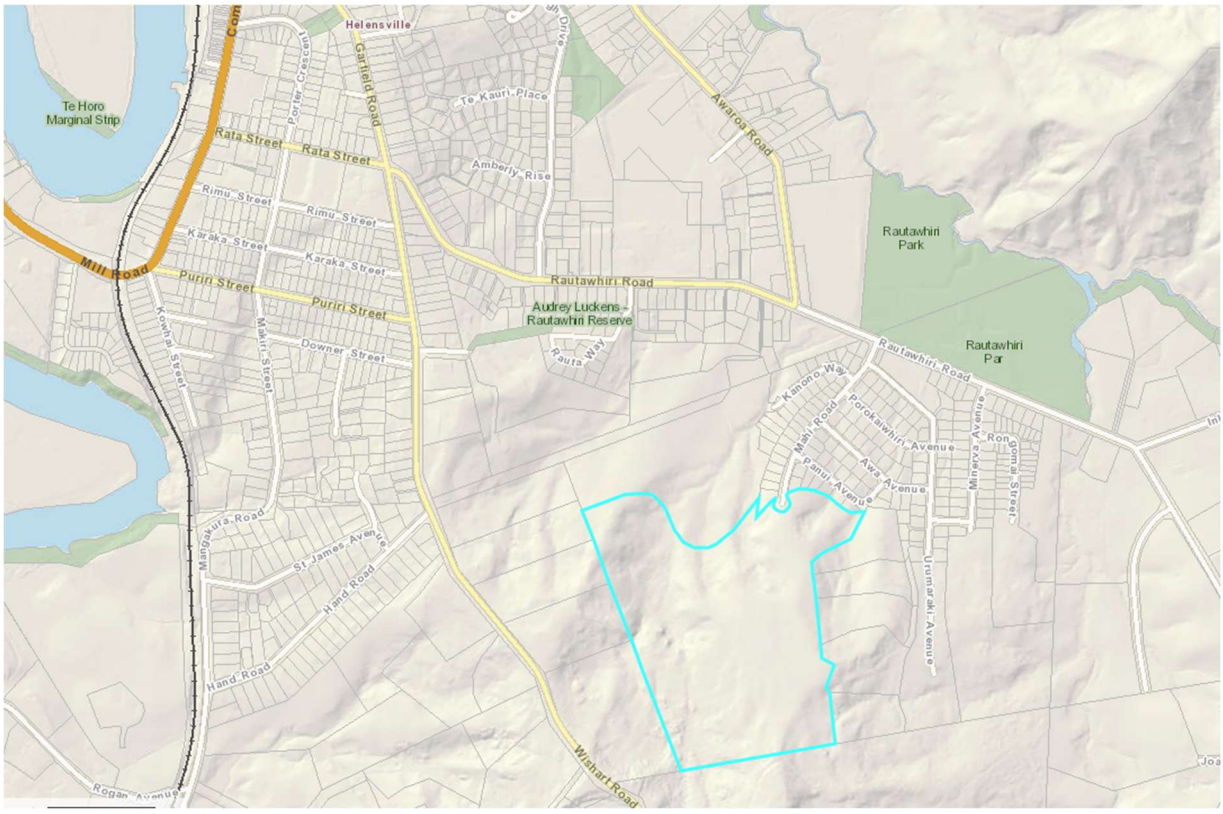

Figure 4 – Site Locality Plan

3. Proposal

The proposed Private Plan Change will enable the residential development of approximately 110 new residential units, comprising of a mixture of standalone, terraced and duplex housing. Access to the site is to be provided via an extension of Mahi Road.

A concept development masterplan (refer to Figure 5) has been prepared by Ian Munro and Civix for the Plan Change Application. The full extent of the proposed Plan Change Area has been modelled in 3d to ensure compliant road grades are achievable across the development and ensure levels and grades for the proposed lots are feasible. The masterplan has undergone multiple revisions to ensure the future development of roading and lots are structured in an efficient manner and are feasible to construct. Refer to drawing CIV-PR-MP-001– Concept Development Masterplan.

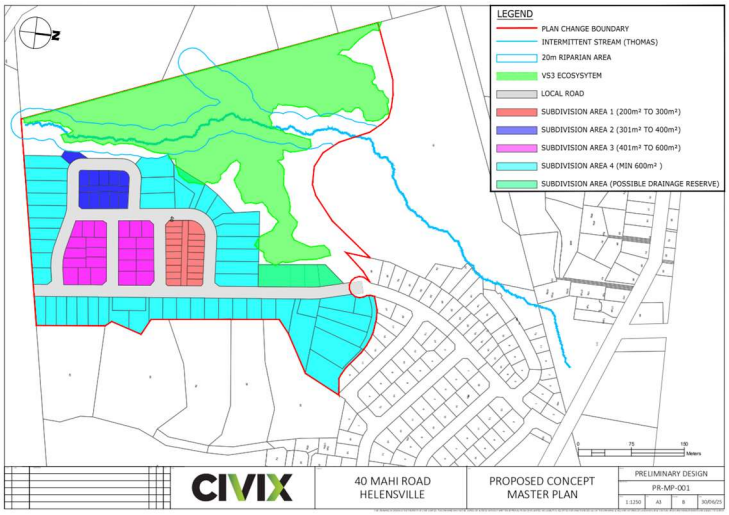

Figure 5- Concept Development Masterplan

4. Earthworks

The proposed development of the plan change area will require bulk earthworks and recontouring of approximately 50% of the existing site area to improve contours to satisfy the design and layout requirements for the development. Bulk earthworks will be required for the construction of the proposed roading network and to provide suitable building platforms for the lots. The Cut Fill Plan(s) on drawing series 30000 show the extent of the proposed earthworks for the development based on the concept masterplan.

A geotechnical desktop assessment has been undertaken by Soil and Rock Consultants in support of the proposed plan change. The geotechnical assessment reviewed the suitability of the site for residential development and details the sites geology and subsurface conditions. The report identified a number of geotechnical considerations and concluded that the site is considered to be generally geotechnically suitable for the extent of development enabled by the proposed plan change. Further geotechnical design may be required for certain areas of the site subject to instability, however this will be addressed during the resource consent application.

A detailed geotechnical investigation should be carried out to further investigate hazards identified, and any recommendations stemming from this should be observed during all detailed design works.

Bulk earthworks will need to be undertaken in accordance with NZS 4404, and Auckland Council Standards. Regional and district Land Use Consents will need to be obtained from Auckland Council.

In accordance with industry best practice, implementation of erosion and sediment controls will be undertaken during the construction works for the development. Erosion and sediment controls will be carried out in accordance with the Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region, June 2016 Guideline Document 2016/005 (GD05).

Works undertaken in accordance with this guideline will act to minimise and/or mitigate any adverse environmental effects of sediment discharge during the works through appropriate use and design of erosion and sediment control techniques and measures. The general principals to be used as part of the erosion and sediment control plan are likely to include the following items:

- Ensure the contractor undertaking the earthworks understands all requirements on the approved erosion and sediment control plan and approved resource consent decision prior to commencing works on site.
- Stage earthworks where possible to allow completed areas to be progressively stabilized.
- Divert all clean water runoff away from the site where possible to help reduce catchment sizes for the open earthwork catchments.
- Divert dirty water runoff from the works areas to the sediment control devices prior to discharging into the downstream environment. Consider a treatment train approach adjacent to high-risk environments like streams. Install appropriate stabilized construction entrances into the development to ensure sediment is not discharged onto the public roads.
- Undertake regular inspections and maintenance on all erosion and sediment control devices to ensure they are always performing to their maximum potential.
- Review the erosion and sediment control devices design, catchments, and appropriateness as the works progress, and make any changes (approved by Auckland Council) required to ensure they are performing as intended.

5. Roading

In order to service the proposed development enabled by the plan change, a new public road network will be required through the plan change area. Using the concept masterplan as an example, the road reserve widths will likely adopt the following widths as set out in the below table:

	Road Reserve Width	Carriageway Width	Footpath Width
Local Road	17.0m	6.0m	1.8m

Underground services will generally be installed in the berms of the proposed roads and the carriageways will be utilised to convey the overland flow paths for 1 in 100-year storm event. On-street parking will be provided where possible through the inclusion of parking bays adjacent to the carriageway.

The existing turning head at the end of the current Mahi Road is proposed to be removed when the extension occurs. The concept masterplan allows for circular through movement of traffic within the public road network therefore no turning head will be required. The geometric design of the proposed road network will be carried out in accordance with the Austroads Design Manual and the Auckland Transport TDM. The speed environment for the new local roading designs are intended to be 30km/h with traffic calming measures to be included in the design as necessary at maximum 60m intervals. These could include speed tables, raised intersections, kerb narrowing's, etc.

6. Flooding & Stormwater (SW)

For details on stormwater management and flooding, please refer to the following documentation accompanying this application:

- Tuflow Flood Modelling Results
- Flood Modelling Methodology Report
- Stormwater Management Plan

7. Wastewater (WW) Servicing

7.1. Existing Infrastructure and Wastewater Network within the Adjacent Area

Council Geomaps indicates that there is an Existing WWMH (ID 5837695) within 40 Mahi Road. This WWMH is to be used as a connection/link between the recently built wastewater network which formed part of the recent Parkview Development works mentioned under heading 2.1. and the proposed development site.

This newly built network discharges into the Rautawhiri Road pumpstation which in discharges into the greater Helensville WW network via a 140mm WW rising main. All WW accumulated within the Helensville network is then discharged/piped into the Helensville WWTP for treatment.

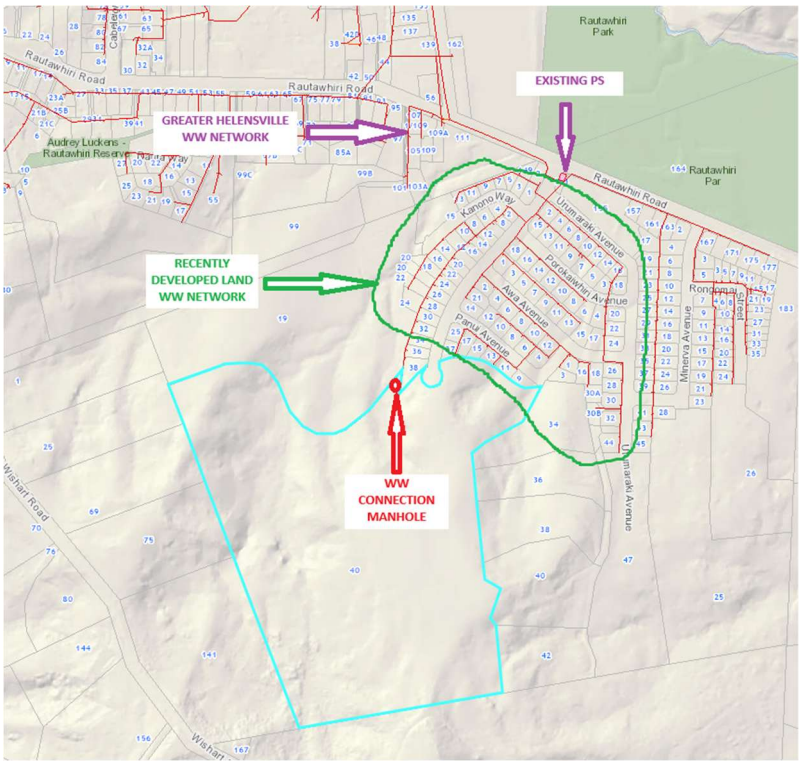

Figure 6- Proposed Wastewater Connection Location and existing WW infrastructure

7.2. Proposed Connection to the Site

The following option has been considered for wastewater servicing for the site:

1. As highlighted under heading 7.1 above, wastewater is to be drained into the existing network located North (downstream) of the proposed development site.

7.2.1. Wastewater Capacity Confirmation

A technical memorandum was compiled and issued to Watercare as part of an early engagement process to confirm wastewater capacities within the wider network. The technical memorandum included a wastewater capacity assessment of the existing wastewater network inclusive of the proposed development.

The wastewater capacity assessment confirms that the existing network directly downstream of the subject site has sufficient capacity to service the proposed development.

Watercare have provided a response to the technical memorandum confirming sufficient capacity is available in the existing network. Please refer to Appendix A for the technical memorandum issued to Watercare and the response provided by Watercare.

8. Water Supply (WS)

It is understood that there is limited capacity in the existing Helensville Water Treatment Plant (WTP) and the reservoir located on Audrey Lane. Future urban areas will not be serviced until upgrades to the WTP have been commissioned. The consultation response letter from Watercare dated 9 August 2024 and included in Appendix A comments that the capacity constraint according to current forecasts is anticipated to resolved by late 2026. However, this letter further states that there is uncertainty around this given an additional water source needs confirmation. Noting that the FDS sets out timing for 2035+ it is possible that water supply upgrades may not occur until as specified in the FDS.

Using the Parkview Development Works as an example/case study, a WS reticulation system is to be designed and constructed in accordance with the relevant Water Code of Practices. As an interim solution for WS for the proposed development, water tanks are to be installed to provide potable water to the development until the proposed upgrade works to the above mentioned WS assets have been completed and are fully operational.

Please refer to Appendix A - Technical Memorandum – Water and Wastewater concerning WS servicing for the proposed site.

9. Power, Telecom, and Gas Supply

Telecommunication Infrastructure:
Chorus have confirmed that they will be able to extend their network to provide connection availability. Note that this undertaking would of course be subject to Chorus understanding the final total property connections and what investment may or may not be required from the developer. Chorus is to deliver the infrastructure to and throughout the site in as seamless and practical way as possible, Refer Appendix C.

Electrical Infrastructure:
Vector have confirmed that they will be able to extend their network to provide connection availability. Note that this undertaking would of course be subject to Vector understanding the final total property connections and what investment may or may not be required from the developer. Vector is to deliver the infrastructure to and throughout the site in as seamless and practical way as possible, Refer Appendix D.

10. Conclusions

- Environmental effects from erosion and sediment during construction can be mitigated.
- The site access design complies with the requirements of the Unitary Plan.
- Water supply can be provided through private water tanks until such time that water supply in the area is available.
- SMAF mitigation requirements for the site can be met via retention tanks and extended detention in wetlands.
- The 10 year network design event can be safety conveyed through the site via a new public drainage network.
- The 100 year flood event can be safety conveyed through the site via the proposed 3D form of the site.
- The proposed development will not increase flood risk for surrounding properties through the mitigation of peaks flows by 100 year detention.
- Wastewater servicing can be provided via extension to the existing public network.
- Telecoms and Power Supply can be provided via new connections.

11. Limitations

- This assessment contains the professional opinion of Civix Staff relating to this development. Civix Staff used their professional judgement and acted in accordance with the standards of care and skill normally exercised by professional engineers providing similar services in similar circumstances. No other express or implied warranty is made as to the professional advice contained in this report.
- We have prepared this report in accordance with the brief provided and following our terms of engagement. The information contained in this report has been prepared by Civix for the client and is exclusively for its client use and reliance. It is not possible to make an assessment of this report without understanding the terms of engagement under which it has been prepared, including the scope of the instructions and directions given to and the assumptions made by Civix. The assessment will not address issues which would need to be considered for another party if that parties' particular circumstances, requirements and experience were known and, further, may make assumptions about matters of which a third party is not aware. No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of or reliance on this assessment by any third party.
- The assessment is also based on information that has been provided to Civix from other sources or by other parties. The assessment has been prepared strictly on the basis that the information that has been provided is accurate, complete, and adequate. To the extent that any information is inaccurate, incomplete or inadequate, Civix takes no responsibility or liability whatsoever for any loss or damage that results from any design and assessment based on information that has been provided to Civix.

Appendix A

WATERCARE EARLY ENGAGEMENT CORRESPONDENCE

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To:
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Nur Jahangir

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Auckland 1050, New Zealand
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From:
Author(s):
Kugan Govender- Civil Engineer
Civix Limited

Civix Job Ref: 40 Mahi Road, Helensville
19 June 2024
Reviewer: Gregg Cunningham- Senior Civil Engineer

Technical Memorandum – Water and Wastewater

40 Mahi Road, Helensville

This memorandum has been written in response to the assessment of water and wastewater capacity by Watercare Services Limited (WSL) received 11th of June 2024.

Water Supply (WS)

It is understood that there is limited capacity in the existing Helensville Water Treatment Plant (WTP) and that future urban areas are not able to be serviced until upgrades to the WTP have been commissioned. Timing for this commissioning is expected to take place in line with the timing of the FDS (i.e. 2035+).

Further information is sought from WSL on the strategy used for the Parkview development. It is understood that the water reticulation network has been designed and constructed in accordance with the ultimate requirements, however connection to the existing network has not been carried out. As an interim solution water tanks have been installed to provide potable water to the development. Please could WSL provide further clarity on these requirements as well as tank sizing details.

Wastewater (WW)

Watercare has highlighted concerns regarding wastewater servicing for proposed development in the Helensville (Stage 1) future urban area out of sequence with Auckland Council's Future Development Strategy (FDS). Several variables have been raised, some which we would like further clarification on.

1. Capacity at the Helensville Wastewater Treatment Plant (WWTP)

Minutes from the Helensville Community Liaison Group Meeting dated 21/11/2023

The WWTP has consented capacity for approximately 6000 people (depending on how much stormwater infiltrates the network) with the plant currently servicing approximately 5000 people. This provides residual capacity for approximately 1000 people. The development concept proposes in the region of 102 lots, which in line with the *Water and Wastewater Code of Practice for Land Development and Subdivision - Chapter 5: Wastewater* equates to an occupancy of 306 people for wastewater design purposes. Thus, leaving a residual capacity post development of approximately 694 people (± 231 2–4-bedroom homes). The assessment of water and wastewater capacity provided by WSL notes only that there is currently capacity at the WWTP however no further detail is provided.

Helensville and Parakai Servicing Strategy published May 2024

Watercare's population forecast modelling indicates that approximately 6,500 people will be living in the area by 2050. Allowing a conservative gross per-capita wastewater production of 435 litres per person per day (including 50 per cent stormwater inflow and infiltration), with an addition of 1,500 people added to the community served would produce 652,500 litres of wastewater per day, during rainy periods. The plant installed as part of the recent upgrades can treat 1,500,000 litres of wastewater per day, so there is sufficient wastewater treatment capacity

2. Existing Local Wastewater Network

An assessment of the existing recently installed wastewater network from WWMH 5837695 located within the proposed development site downstream to the existing Rautawhiri Road Pump Station located at the corner of Mahi and Rautawhiri Road has been undertaken to determine the current capacity of the network. Note that WW flow from 19 Kanono Way has also been considered in this assessment. It is assumed that the development at 19 Kanono Way will contain 60 Lots. **In conclusion, the immediate downstream network from the development site to the Rautawhiri Road pump station has sufficient capacity to service the proposed development. Please refer to the infrastructure assessment plan series 62000 and associated capacity assessment tables series 62100 appended to this memorandum for further details.

** Wastewater pipe GIS ID 4829206 has been modified for this assessment as it is not indicated to connect to the pump station however adjacent invert levels indicate that it does. WSL to confirm network connectivity in this area.

3. Rautawhiri Road Pump Station

Based on a desktop assessment using the Watercare GIS viewer, Auckland Council Geomaps and latest available aerial imagery, as highlighted in Table 1: Expected PWWF into the Rautawhiri Pump Station the existing pump station currently services approximately 183 residential units. It is assumed based on the installation date (May 2019) that in line with the wastewater code of practice, this has been designed to cater for the future development of all upstream catchments. Further information on the Rautawhiri road pump station including as-builts, design catchment/capacities and current operating flows is required from Watercare Services Limited. The forecast approximate peak wet weather flows to this pump station in line with the anticipated development sequence have been tabulated below for reference.

Pre and Post WW Flow Generation to the Rautawhiri Road Pump Station		
Scenario Assessed	**Estimated Lots contributing to the pump station**	**Estimated Peak Wet Weather Flow into the Pump Station (l/s)**
Current Scenario	183	7.7
Current Scenario + 19 Kanono Way	243	10.2
Current Scenario + 19 Kanono Way + 40 Mahi Road	345	14.5

Table 1: Expected PWWF into the Rautawhiri Pump Station

Figure 1: Proposed Site Locality Plan (40 Mahi Road)

Figure 2: Proposed Site Locality Plan (19 Kanono Way)

Attachments:

- Plan Series 62000 - Wastewater Infrastructure Assessment
- Plan Series 62100 - Wastewater Capacity Tables
- Helensville Community Liaison Group Meeting – November 2023 Minutes
- Helensville and Parakai Servicing Strategy published May 2024
- Watercare Services Limited - Assessment of Water and Wastewater Capacity

Should you have any questions in relation to any of the above, please feel free to contact the undersigned via email on kugan@civix.co.nz

Kind Regards,

Written By:

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Reviewed By:

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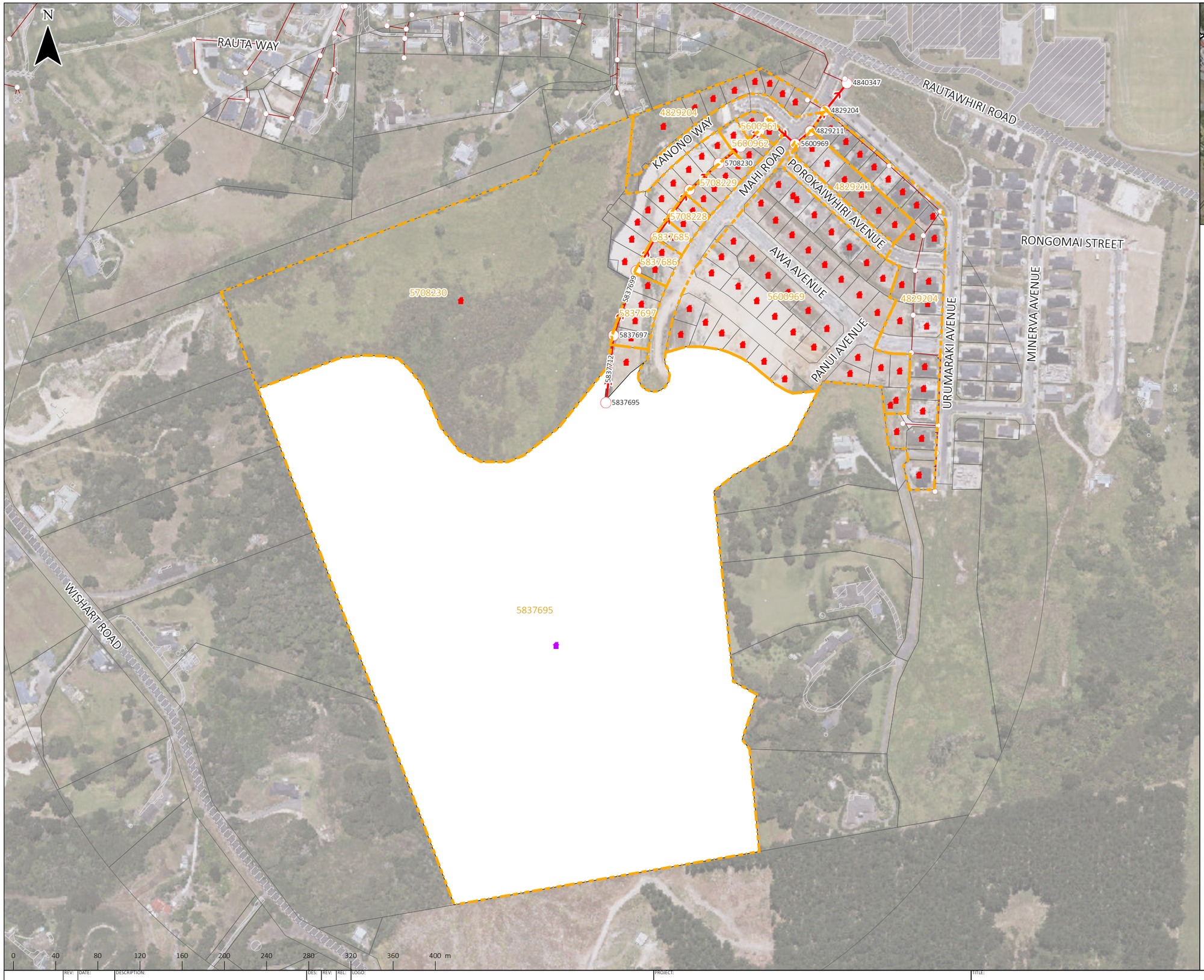
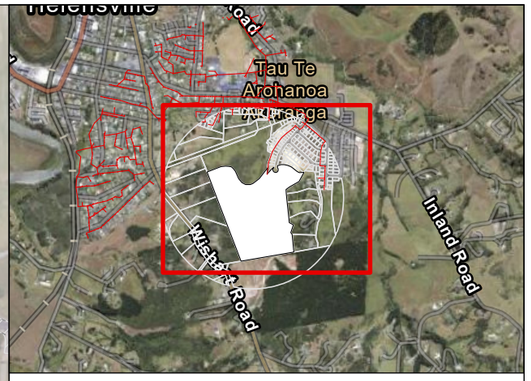
CIVIX LIMITED





- WW NODE
- WW NODE ASSESSED
- WW LINK
- WW LINK ASSESSED
- PROPOSED
- EXISTING
- CATCHMENT
- BUILDINGS
- NEW PARCELS
- EXISTING PARCELS
- EXISTING KERBLINES
- EXISTING IMPERVIOUS
- EXISTING BUILDINGS

IMAGERY CREDITS:
AUCKLAND COUNCIL, MAXAR, EAGLE TECHNOLOGY, LAND INFORMATION NEW ZEALAND, GEBCO, COMMUNITY MAPS CONTRIBUTORS, LINZ, STATS NZ, ESRI, TOMTOM, GARMIN,

SCAN FOR 3D:

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REV:	DATE:	DESCRIPTION:	DES:	REV:	REL:

CIVIX

PROJECT: 40 MAHI ROAD HELENSVILLE

TITLE: WASTEWATER INFRASTRUCTURE ASSESSMENT

STATUS: FOR INFORMATION ONLY

DRAWING NO: 62000

SCALE:	SIZE:	REVISION:	DATE:
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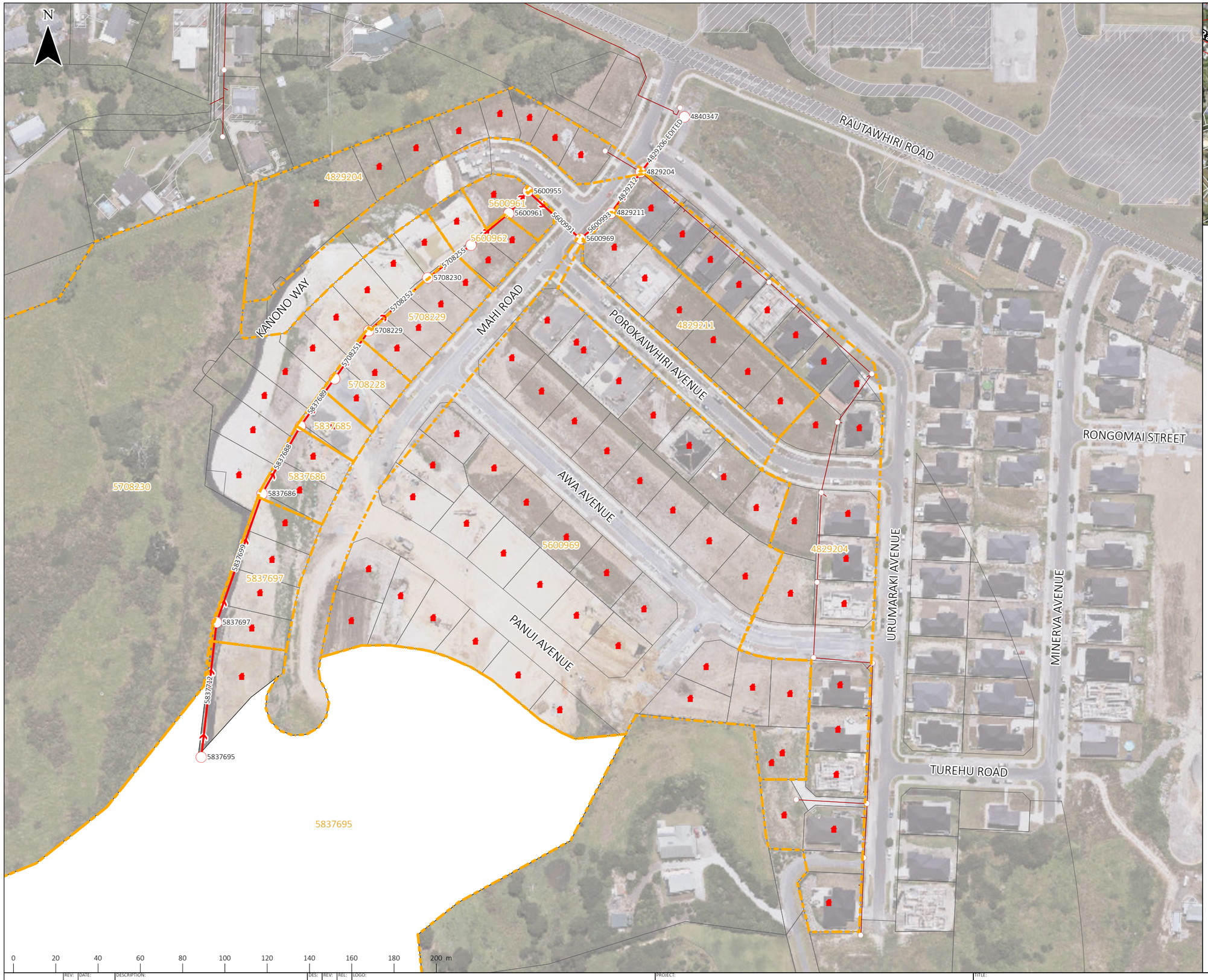

- WW NODE
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- CATCHMENT
- BUILDINGS
- NEW PARCELS
- EXISTING PARCELS
- EXISTING KERBLINES
- EXISTING IMPERVIOUS
- EXISTING BUILDINGS

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SCAN FOR 3D:

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REV:	DATE:	DESCRIPTION:	DES:	REV:	REL:

LOGO: CIVIX

PROJECT: 40 MAHI ROAD HELENSVILLE

TITLE: WASTEWATER INFRASTRUCTURE ASSESSMENT

STATUS: FOR INFORMATION ONLY

DRAWING NO: 62001

SCALE:	SIZE:	REVISION:	DATE:
1:1,750	A3	03/07/24	03/07/24

INFRASTRUCTURE DETAILS

LINK ID		**5837712**	**5837699**	**5837688**	**5837689**	**5708251**	**5708252**	**5708255**	**5600989**	**5600990**	**5600991**	**5600993**	**4829212**
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DWG LONGSECTION		-	-	-	-	-	-	-	-	-	-	-	-
STATUS		IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN
OWNER		PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC	PUBLIC
UPSTREAM NODE ID		5837695	5837697	5837686	5837685	5708228	5708229	5708230	5600962	5600961	5600955	5600969	4829211
DOWNSTREAM NODE ID		5837697	5837686	5837685	5708228	5708229	5708230	5600962	5600961	5600955	5600969	4829211	4829204
UPSTREAM GROUND LEVEL	RL (m)	29.84	23.79	23.55	23.59	22.05	20.33	17.34	14.90	12.58	12.20	11.02	10.24
UPSTREAM INVERT LEVEL	RL (m)	27.98	23.30	22.76	21.01	19.71	16.88	13.31	11.57	10.11	9.21	8.77	7.49
DOWNSTREAM GROUND LEVEL	RL (m)	23.79	23.55	23.59	22.05	20.33	17.34	14.90	12.58	12.20	11.02	10.24	7.92
DOWNSTREAM INVERT LEVEL	RL (m)	23.30	22.76	21.01	19.71	16.88	13.31	11.57	10.11	9.21	8.77	7.49	5.90
PIPE TYPE		PIPE	PIPE	PIPE	PIPE	PIPE	PIPE	PIPE	PIPE	PIPE	PIPE	PIPE	PIPE
PIPE SLOPE	**m/m**	**7.29%**	**0.84%**	**4.76%**	**4.70%**	**10.22%**	**9.54%**	**6.73%**	**6.27%**	**6.55%**	**1.31%**	**6.77%**	**6.62%**
PIPE LENGTH	**m**	**64.2**	**64.6**	**36.7**	**27.7**	**27.7**	**37.4**	**25.9**	**23.3**	**13.7**	**33.6**	**18.9**	**24.0**
PIPE BARRELS		1	1	1	1	1	1	1	1	1	1	1	1
PIPE INTERNAL DIAMETER	**mm**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**	**150.000**
PIPE MATERIAL		PVC	PVC	PVC	PVC	PVC	PVC	uPVC	PVC	uPVC	PVC	PVC	PVC

CATCHMENT DETAILS

RES3BED_UNITS EXISTING		1	5	7	8	10	14	83	86	88	88	131	137
RES3BED_UNITS PROPOSED		102	102	102	102	102	102	102	102	102	102	102	102
RES3BED_UNITS TOTAL		103	107	109	110	112	116	185	188	190	190	233	239

FLOW RESULTS

WW ADWF EXISTING	L/s	0.0	0.0	0.0	0.0	0.1	0.1	0.5	0.5	0.5	0.5	0.8	0.9
WW ADWF PROPOSED	L/s	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
WW ADWF TOTAL	**L/s**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**1.2**	**1.2**	**1.2**	**1.2**	**1.5**	**1.5**
WW PDWF EXISTING	L/s	0.0	0.1	0.1	0.2	0.2	0.3	1.6	1.6	1.6	1.6	2.5	2.6
WW PDWF PROPOSED	L/s	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
WW PDWF TOTAL	**L/s**	**1.9**	**2.0**	**2.0**	**2.1**	**2.1**	**2.2**	**3.5**	**3.5**	**3.6**	**3.6**	**4.4**	**4.5**
WW PWWF EXISTING	L/s	0.0	0.2	0.3	0.3	0.4	0.6	3.5	3.6	3.7	3.7	5.5	5.7
WW PWWF PROPOSED	L/s	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
WW PWWF TOTAL	**L/s**	**4.3**	**4.5**	**4.6**	**4.6**	**4.7**	**4.9**	**7.7**	**7.9**	**8.0**	**8.0**	**9.8**	**10.0**

COLEBROOKE WHITE PIPE FULL ANALYSIS AT TARGET FLOW

TARGET FLOW TYPE		PWWF	PWWF	PWWF	PWWF	PWWF	PWWF	PWWF	PWWF	PWWF	PWWF	PWWF	PWWF
TARGET FLOW	L/s	4.3	4.5	4.6	4.6	4.7	4.9	7.7	7.9	8.0	8.0	9.8	10.0
PIPE ROUGHNESS	mm	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
VELOCITY	m/s	0.24	0.25	0.26	0.26	0.27	0.27	0.44	0.45	0.45	0.45	0.55	0.57
HGL GRADE	%	0.06%	0.07%	0.07%	0.07%	0.08%	0.08%	0.20%	0.20%	0.21%	0.21%	0.31%	0.33%
HEADLOSS PIPE	m	0.04	0.04	0.03	0.02	0.02	0.03	0.05	0.05	0.03	0.07	0.06	0.08

COLEBROOKE WHITE PIPE FULL ANALYSIS HGL AT GRADE

VELOCITY	m/s	2.73	0.92	2.21	2.19	3.24	3.13	2.63	2.54	2.59	1.15	2.63	2.61
PIPE CAPACITY	**L/s**	**48.3**	**16.2**	**39.0**	**38.7**	**57.3**	**55.3**	**46.4**	**44.8**	**45.8**	**20.3**	**46.6**	**46.0**
EXISTING PIPE CAPACITY SUFFICIENT?		**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**

MANNINGS ANALYSIS

DEPTH	m	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
AREA	m²	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
WETTED PERIMETER	m	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
HYDRAULIC RADIUS	m	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
MANNINGS N		0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
VELOCITY	m/s	3.12	1.06	2.52	2.50	3.69	3.57	2.99	2.89	2.95	1.32	3.00	2.97
PWWF CAPACITY FOR NEW PIPES	**L/s**	**44.3**	**15.0**	**35.8**	**35.6**	**52.5**	**50.7**	**42.6**	**41.1**	**42.0**	**18.8**	**42.7**	**42.2**
IS PROPOSED PIPE CAPACITY SUFFICIENT?		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

HYDRAULIC GRADE LINE RESULTS

VELOCITY	m	1.70	0.79	1.48	1.48	1.96	1.93	1.96	1.92	1.95	1.09	2.09	2.09
DOWNSTREAM HGL LEVEL	RL (m)	23.39	22.81	21.04	19.76	16.91	13.35	11.61	10.15	9.32	8.85	7.54	5.95
UPSTREAM HGL LEVEL	RL (m)	28.01	23.35	22.79	21.04	19.74	16.91	13.35	11.61	10.15	9.27	8.82	7.54
UPSTREAM FREEBOARD	**m**	**1.83**	**0.44**	**0.76**	**2.55**	**2.31**	**3.42**	**3.99**	**3.29**	**2.43**	**2.93**	**2.20**	**2.70**
IS US NODE SURCHARGING?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
IS US NODE OVERFLOWING?		**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

ESTIMATED ADDITIONAL NETWORK CAPACITY

DESIGN PIPE FLOW CAPACITY	L/s												
RESIDUAL PIPE CAPACITY POST DEVELOPMENT	L/s	44.0	11.7	34.4	34.1	52.6	50.5	38.7	36.9	37.8	12.4	36.8	36.0
RESIDUAL CAPACITY EXPRESSED AS 3BED UNITS	Units	1,051	280	822	815	1,255	1,205	923	882	903	296	879	861

SCAN FOR 3D:

allsite.ai

REV:	DATE:	DESCRIPTION:	DES:	REV:	REL:

LOGO: CIVIX

PROJECT: 40 MAHI ROAD HELENSVILLE

TITLE: WASTEWATER CAPACITY TABLE

STATUS: FOR INFORMATION ONLY

DRAWING NO: 62100

SCALE:	SIZE:	REVISION:	DATE:
1:100	A3	03/07/24	03/07/24

Helensville Community Liaison Group Meeting – November 2023 Minutes

Details

- Date: 5 pm 21 November 2023
- Venue: Helensville Wastewater Treatment Plant

Attendance

Nathaniel Wilson	Watercare Environmental Care Manager
Emma Baker	Watercare Environmental Scientist
Gabriel Freitas De Almeida	Watercare Operations Controller
Kenny Williamson	Watercare Wastewater Production Manager North
Annmarie Holst	Watercare Stakeholder and Communities Coordinator
Mark Dennis	Rodney Local Board
Dave Addison	Helensville News
John Dyer	Fish + Game Council
Shona Oliver	Pest Free Rodney
Sam Bennett	Resident
Richard Kidd	Resident
Keith Martin	Waikato District Council
Raewyn Turnwald	Resident
Darren Turnwald	Resident
Duncan Ross	Planner
Fiona Ewen	Resident

Introductions

- Watercare staff introduced themselves and explained their roles.
- Members of the group introduced themselves.
- Watercare staff explained the function of the community liaison group meetings and agenda for the evening; a discussion of plant operations and performance, followed by a tour of the plant, where group members could ask questions. Questions that were unable to be answered during the tour have been answered within these minutes.

Plant operation and performance

Watercare discussed the annual compliance report for 2022 and 2023. Prior to infrastructure upgrades at the plant, most water quality parameters were fully compliant, however the compliance limits for ammoniacal nitrogen were not consistently met. As a result, Auckland Council issued Watercare with an abatement notice in 2021.

To address the issues with effluent quality, Watercare installed membrane aerated biofilm reactor (MABR), the first operational in New Zealand. The MABR tanks are second to last point in the treatment process, and work to reduce ammoniacal nitrogen.

The plant has been fully compliant with the effluent discharge limits since the installation of the MABR. Reconfiguration of the plant processes during this upgrade has also allowed for increased capacity to cope with peak wet weather inflows. Monitoring of the technology's performance is ongoing.

The storms at the beginning of 2023 caused significant inflows to the plant beyond the treatment capacity. As a result, bypasses of partially treated wastewater occurred, and additional environmental monitoring was undertaken in the Kaipara during this period.

Additionally, Watercare has added height to the waveband of the pond to rectify historical differential settlement. A group member queried whether these ponds are like settling ponds, which Watercare can confirm is partially correct – sediment settles in the ponds, but such settling is not the pond's primary purpose.

General Business

Development

Group members queried the plant's capacity for additional development in Helensville and Parakai and how Watercare plans for future populations. Watercare explained that Auckland Council population projections are used for programme management of assets, however the primary limiting factor for development in this area is sufficient water supply.

At present, the plant services approximately 5,000 people, with consented capacity equivalent to about 6,000 depending on how much stormwater gets into the system – the current annual average limit is 1,500 m^3/day. The treatment capacity of the plant is greater, but the capacity of the whole wastewater scheme also depends on the configuration of the sewerage network, which is something that Watercare's Development team must scrutinize as part of any proposed new development.

Next meeting

November 2024

Te Rautaki Whakarato a Helensville me Parakai

Helensville and Parakai Servicing Strategy

I whakaputaina i te Hakihea 2023 | Published May 2024

Watercare

Ngā whakarite | Preparation

I arotakengia, i taunakitia hoki tēnei whakaputanga e:
Reviewed and recommended for publication by:

Name: Chris Allen

Position: Manager Strategic Planning, Watercare

I whakāetia tēnei whakaputanga e:
Approved for publication by:

Name: Priyan Perera

Position: Head of Strategy and Planning, Watercare

Ngā mihi | Acknowledgements

We acknowledge mana whenua that have interests within this strategic area, Ngāti Te Ata, Ngāti Maru, Ngāti Wai, Ngāti Whatua, Te Kawerau ā Maki, Te Aki Tai, Ngāti Whatua Orakei, Ngāti Whatua o Kaipara, Ngāti Manuhiri. Nga Maunga o Whakahii were consulted through the development of this document as the mana whenua representative of the strategic area.

This document was prepared by Watercare's Strategic Planning team. As consultants to Watercare, Aurecon and Stantec led early technical input to the plan and supported the mana whenua engagement. We also acknowledge the contributions from Rodney Local Board and the community in providing feedback which has been incorporated into this strategy.

Ngā ihirangi | Contents

Whakarāpopototanga matua
Executive summary

This document sets out a long-term strategy to ensure we continue to provide safe and reliable services to Helensville and Parakai's communities. The purpose of this document is to describe our servicing options in a way that the public can understand, so that we can make decisions about the future in partnership with the community we serve.

Helensville and Parakai are communities on the Kaipara River, about 40 kilometres north-west of Auckland and located within the Rodney Local Board area. Currently, the communities have a population of around 5,000 residents. By 2050, the communities are expected to have a population of around 6,500 people. Our engagements in the area showed us that the community would like to see Helensville and Parakai grow and thrive as a town, and is looking for good communication around efforts to enhance the environment and grow its resilience to extreme weather events and sea level rise. Community members are seeking confidence in both water and wastewater services. We hope this document will go some way to demonstrate that we are listening.

During engagements with Kaipara College students, we learned that young people from the area also hope for a growing, thriving town over the medium and long-term, despite challenges emerging from climate change. They were also interested in other infrastructure enablers, namely telecommunications and transport, seeking a shared understanding and partnered approach between utilities/CCOs who will need to work together to support the realisation of these aspirations for the area.

We provide water supply services and wastewater (sewage) services for Helensville and Parakai. We face a number of challenges in providing drinking water services in the area. With the projected population growth and climate change, and limited and ageing assets, we are preparing to make some important decisions with the Helensville and Parakai public about where their water is going to come from in the future and how their wastewater is managed.

The publication of this servicing strategy comes at the same time as the Council is engaging the Helensville/Parakai community to inform their coastal adaptation plans for the area. We will ensure that our plans align with Council's overall strategy.

Helensville and Parakai have been supplied with water from the Mangakura Dams since the early 1900s. The Sandhills Wetland water source was added to the water supply in 1975. Given that these are surface-water sources, the supply is not resilient enough in the context of climate change impacts and we face increasing demand due to housing development and population growth in the area. In the short term, we need to renew the Helensville water take consent, which is due to expire in 2026. We are also exploring reliable alternative water sources to accommodate for the growth in the area and for the generations to come.

Our wastewater service in the area is not without challenges either. Our wastewater infrastructure and consents require action in the short term. We need to renew the Helensville's Wastewater Treatment Plant (WWTP) discharge consent, which is due to expire in 2027. The plant had been facing significant capacity and treatment challenges but was upgraded to modern technology which treats wastewater to a high standard in 2023. The location of the wastewater treatment pond in the tidal range of te Awa Kaipara (the Kaipara River) makes it prone to high tides in the short term and rising sea levels in the medium term, posing a significant resilience risk. We also want to minimise our impact on the environment. In the medium to long term, we need to investigate ways to reduce our discharges into the Kaipara River through options, including land treatment and wastewater reuse. Should recycling and reuse of highly treated and purified wastewater be pursued, this will allow us to reduce discharges into the Kaipara Moana (Kaipara Harbour) environment.

Our overarching strategy for communities that are not connected to the Auckland metropolitan water network is to pursue local solutions rather than connect to the metropolitan network. In doing this we believe we improve local resilience by reducing reliance on long, piped systems to distant infrastructure. We also acknowledge our commitment to initially explore all local alternatives so that we can gradually decrease Auckland's reliance on te Awa Waikato (the Waikato River) as a water source. We will continue with this approach unless there is a substantial risk to public health or the environment resulting from the current way of operating.

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Te mahi tahi me
Iwi interests

The cultural information in this document belongs to the iwi that helped create this Helensville and Parakai pilot servicing strategy. To protect Mātauranga Māori, this cultural information shouldn't be shared beyond the context of this strategy without talking to and getting approval from the local iwi who own this information.

It is important to include cultural values and associations in any works programme. This means consistently using a partnership and co-management approach for each strategy area.

It is necessary to engage with the relevant iwi groups early and meaningfully. This ensures that as a member of the Auckland Council family we meet our obligations to ngā mana whenua o Tāmaki Makaurau and te Tiriti o Waitangi. As kaitiaki, iwi play a key role in shaping and supporting this servicing strategy.

The following guidance is to consider meaningful engagement with Ngāti Whātua o Kaipara to support the development of the Helensville and Parakai servicing strategy. Our engagement in 2022 and 2023 with iwi and previous mana whenua discussions indicate that six other iwi may also have a direct interest in this area.

Engagement with mana whenua

Broadly our wānanga (workshop) for this area suggested that our partnership discussions should predominantly be with Ngāti Whātua o Kaipara with Ngā Maunga Whakahii o Kaipara being the post-settlement governance entity with kaitiaki interest in this rohe (area).

Wānanga events over a number of weeks were attended by iwi partners and an iwi-appointed subject-matter expert. These events identified key priorities for mana whenua, including:

- Clean waterways
- Respectful service management
- Restoration of waterways
- Partnership and kaitiaki opportunities
- Sustainable resources for future generations.

The mana whenua stance that all waterways are important adds a level of certainty to the need for a partnership approach to achieve iwi-approved service management. Ngā Maunga Whakahii o Kaipara also identified the Sandhills Wetland as a sensitive environmental asset. This is supported by annual assessments of the stream environment by Watercare, which concur that the wetland is a viable fish habitat providing refuge for native eels.

In future revisions of this document, we will look to include more detailed considerations from Ngā Maunga Whakahii o Kaipara with their approval, including a location-specific te mana o te wai statement, whakapapa, history mātauranga and tikanga, the role and responsibilities of iwi as kaitiaki, Te Ao Māori (Māori world view) and kaitiakitanga (guardianship).

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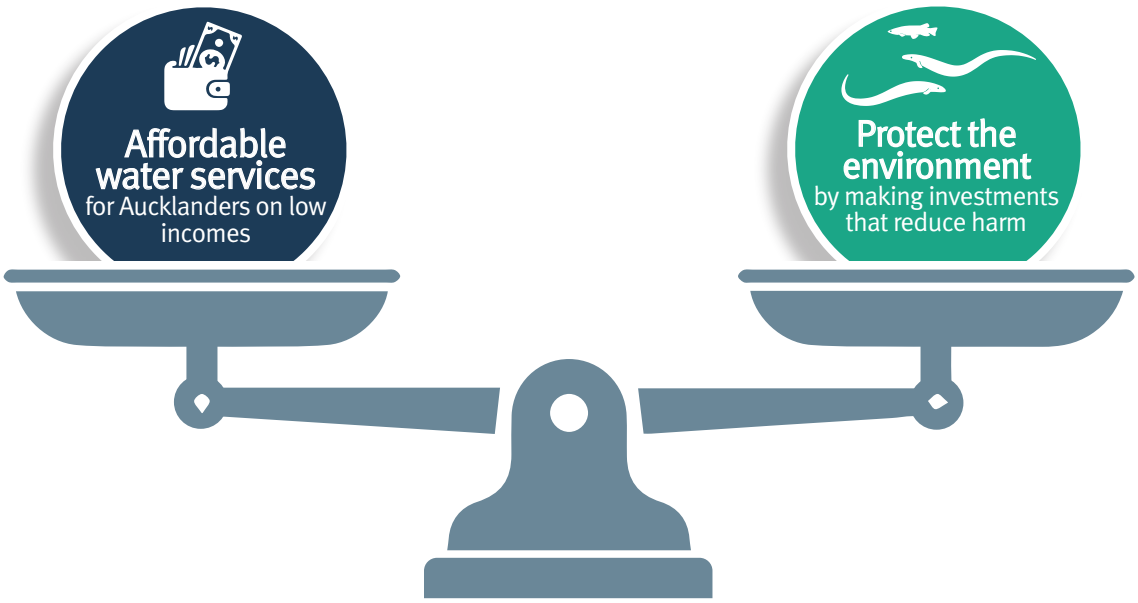
Te mahi me te hapori
Working with the community

Through this strategy, Watercare is committing to making decisions that balance our commitment to te Mana o te Wai with ensuring that our services remain affordable. Careful planning for growth will be important to the prosperity and wellbeing of the area and the health of people and their environment. The public has an important role to play in engaging with us and to ensure that we get this balance right.

As we consider future needs for water and wastewater services, we are taking a long-term and inter-generational approach, thinking about sustainable services for at least the next 70 years. When we build things like reservoirs, pipes, pumps, and treatment plants, they stay in place for decades. Decisions that we make today will affect the generations to come, and it's important to work together with the community to make the right choice of trade-offs.

Sharing this document give us a reference point to guide continued dialogue. We want to ensure everyone can access this servicing strategy and understand the water and wastewater issues and opportunities in Helensville and Parakai, and our approach to addressing them. We also want to hear whether this is a good strategy, whether there are better ideas out there and what we may have missed. This strategy will prepare ourselves and our communities for the complex kōrero that we need to have about water and wastewater services in this area. We are committed to transparency and accountability and are happy to be challenged with ideas for improvement.



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Tirohanga whānui, te whakatakanga, ngā aronga me ngā whāinga

Vision and mission, goals and objectives

The services we provide are reliable and contribute to protecting and improving the health and wellbeing of the community and the ecosystem, in the face of changing climate and population dynamics.

This servicing strategy plays an important role in informing our plans and operations.

It is the overarching document that outlines the long-term vision, objectives and goals for water and wastewater services in the area by considering factors like population growth, environmental considerations, regulatory requirements, and infrastructure needs. Our plans including facility plans, network plans and ultimately our tactical investment plan. Our Asset Management Plan translates these into actionable steps and specific projects.

All of these components work together to make sure we have reliable and safe water and wastewater services that can provide for more people, cater for future generations, are good for the environment, and follow the rules.

Ngā whāinga rautaki whakarato
Servicing strategy objectives

Mana whenua engagement: We're collaborating closely with local Māori communities to ensure that their perspectives and values shape our plans. This approach brings diverse insights to the table, enriching our strategies with cultural wisdom and community voices.

Community engagement: We're all ears when it comes to understanding what the community needs and aspires to. Our aim is to create services that match community needs, making sure everyone benefits from our efforts.

Public health and community wellbeing: The public's safety and wellbeing are top priorities. By providing services that keep the public healthy, we contribute to a thriving and secure community.

Population growth: As the community grows, we're working hard to prepare for the increased demand on our resources and services. Balancing this growth with protecting the natural environment is a key challenge that we are addressing. We integrate land use and water planning at a regional, catchment and site scale as per our commitment to the Auckland Water Strategy (see Appendix 1).

Environmental enhancement: Our commitment to nature is unwavering. We're not just providing water and wastewater services – we're also dedicated to preserving and improving the environment as we go along.

Carbon reduction: We're taking steps to reduce greenhouse gas emissions from our activities. While it might mean changes in our practices, we think the benefit to the environment is worth the effort.

Sustainability: Making decisions that stand the test of time is important to us. While it may require some adjustments, the result is a more resilient and lasting approach to providing water services to communities and protecting the environment.

Meeting our statutory obligations: While it might mean added steps in our processes, it's a necessary aspect of delivering trustworthy services.

Affordability and cost-effectiveness: We strive to provide excellent services without breaking the bank. Finding this balance ensures quality without financially overburdening the community.

Climate change: This decade and the ones that follow are likely to bring unprecedented extreme weather. We need to muster all our foresight and adaptive ability to ensure that our services remain dependable when disaster strikes.

In making decisions, we consider various factors and trade-offs. Sustainability will require changes in our approach, and affordability will involve careful resource allocation. While we aim to strike the best balance we can with the information we have, these objectives sometimes need to be weighed against each other to make the best decisions for the community and the environment. We want these trade-offs to be more transparent, to help build an understanding of how decisions are made.

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Te aromatawai ratonga ā-rohe: Helensville me Parakai

Service area: Helensville and Parakai

Kupu whakataki | Introduction

This servicing strategy covers the communities of Helensville and Parakai, located about 40 kilometres north-west of Auckland in the Rodney Local Board area. Approximately 4,200 people call these two towns home, where they live, work and play. Among them, Kaipara College educates around 800 students, some of whom come from nearby towns, including a few from Auckland. There are about 1800 homes and more than 200 local businesses in the area. People in Helensville and Parakai share a strong sense of belonging with inter-generational connections to the land and history. In addition, new residential developments in the region are attracting newcomers for reasons such as affordable housing (compared with Auckland), employment opportunities in light industry, services, and retail sectors, and also retirement options.

Helensville, known for its historic charm, is home to the iconic Helensville Railway Station, a heritage-listed building dating back to 1915. The area also boasts the Kaipara Coast Sculpture Gardens, a serene spot where art and nature converge. Just a short drive away, four kilometres to the north, Parakai is famous for its natural thermal springs and the Parakai Springs Water Park, providing an escape for relaxation and aquatic adventures. These twin towns not only serve as gateways to the beautiful Kaipara Harbour but also offer a glimpse into New Zealand's rich history and the rejuvenating power of its geothermal wonders.

We provide both water supply and wastewater services for Helensville and Parakai. We estimate that each person uses approximately 150 litres of water per day in Helensville and Parakai. Approximately 80 per cent of the water used in households becomes wastewater; this means that each person produces approximately 120 litres of wastewater every day. When it rains, rainwater also enters the wastewater network through incorrectly installed downpipes and unauthorised connections. In the Helensville and Parakai network, stormwater inflow into the wastewater network makes up to half of the volume of the wastewater that we would normally treat in dry weather. Wastewater and stormwater that enter into the network need to be treated at the WWTP before being discharged into the environment.

It is important that private properties contribute to the proper functioning of the wastewater network. Flushing unwanted objects down the toilet not only can cause clogging of private wastewater pipes, but also increases our operational costs related to removing blockages. Therefore, it is in the community's best interest to be mindful of what goes into the wastewater network. By minimising the introduction of rainwater and other non-wanted items, we can reduce maintenance requirements, control operational costs, and enhance the overall efficiency of our WWTP.

This will help us to be more efficient with our wastewater treatment and limiting untreated discharge into the environment. Balancing our need to invest in the wastewater network for environmental protection with keeping costs affordable for the community requires cooperation from everyone. Every resident plays a crucial role in creating a sustainable and efficient wastewater management system for Helensville and Parakai communities.

History of Kaipara River Catchment occupation and modification

The Kaipara River catchment, with a history of over seven centuries of human occupation, has been primarily shaped by Māori presence and European influences dating back nearly 180 years. Human activities in the catchment have left a mark on its vegetation, archaeological sites, historic structures, place names, and cultural associations.

In the pre-European era, the te Taou hapū of Ngāti Whātua and te Kawerau ā Maki had strong connections to the catchment. Māori occupation involved land modification, including the use of fire for land clearance, earthworks, and food cultivation. They harvested a variety of resources from the land, waterways and wetlands. Numerous place names throughout the catchment reflect the Māori connection, and these names still hold significance for local Māori communities.

> *'The name Kaipara appears to have applied traditionally to the Harbour and in particular to its southern arm. The Kaipara River itself had many different names that applied to its component parts. For example, the meandering bends in the river near Helensville were known as Tungoutungou while the section near the*

main river bridge was known as Te Pu a Tangihua. Further upriver were the shoals known as Kaiwaka, and the meander north of Rewiti which was known as Tua te tua.'

The lower Kaipara River and its tributaries were significantly impacted by European settlement, especially in the mid-1800s when organised European communities began to establish themselves. Timber milling became a major industry, and this activity, along with agriculture, led to permanent changes in the landscape and water bodies. European settlement also introduced the practice of drainage and land clearance for agriculture, impacting water tables and water flows.

Exotic forestry operations, such as the development of Riverhead State Forest and Woodhill State Forest, further influenced water tables and water bodies. The growth of dairy farming and the development of creameries in the early 20th century had a significant impact on water resources. The introduction of bore wells and drainage works became common on farms.

The catchment continued to evolve with urbanisation and residential development, particularly in the Kumeu-Huapai and Waimauku areas. The expansion of market gardening, orcharding and viticulture, along with the impacts of bore installations and farm dams, continues to increase water demand and water allocation challenges.

Te taupori me ngā whakawhanaketanga | Population and development

Today Helensville and Parakai are identified as rural settlement areas of Auckland. The area has a range of different land-use zones: primarily residential, with some business land.

There is some growth in residential population and demand for services and expected plan changes for this area. While private developments are happening in the area, the recently approved Auckland Future Development Strategy suggests that full build out of the future urban-zoned areas in Helensville is to be scheduled to after 2035. This is to align with our provision of water and wastewater services, and the expected upgrade requirements of the treatment plants as a result of their respective consenting processes.

Helensville and Parakai population forecast

Currently, the communities have a population of approximately 5,000 residents in total. Population forecasts indicate a growing population in Helensville and Parakai over the next 30 years. Based on our water and wastewater connections and proposed new developments in the area, we estimate that there will be approximately 6,500 people living in the area by 2050 (see chart below). In the short term, our population forecast carries a reasonable level of certainty. However, it is crucial to acknowledge that the long-term forecast is susceptible to shifts influenced by regulatory and planning measures.

In addition, the effects of climate change could make some of the low-lying areas around the Kaipara River uninhabitable, necessitating a strategic retreat from existing residential areas. Although these will become clearer in the future, it is vital that we proactively engage in discussions with the Helensville and Parakai communities, and continue to monitor the policies to prepare for such scenarios in the future.

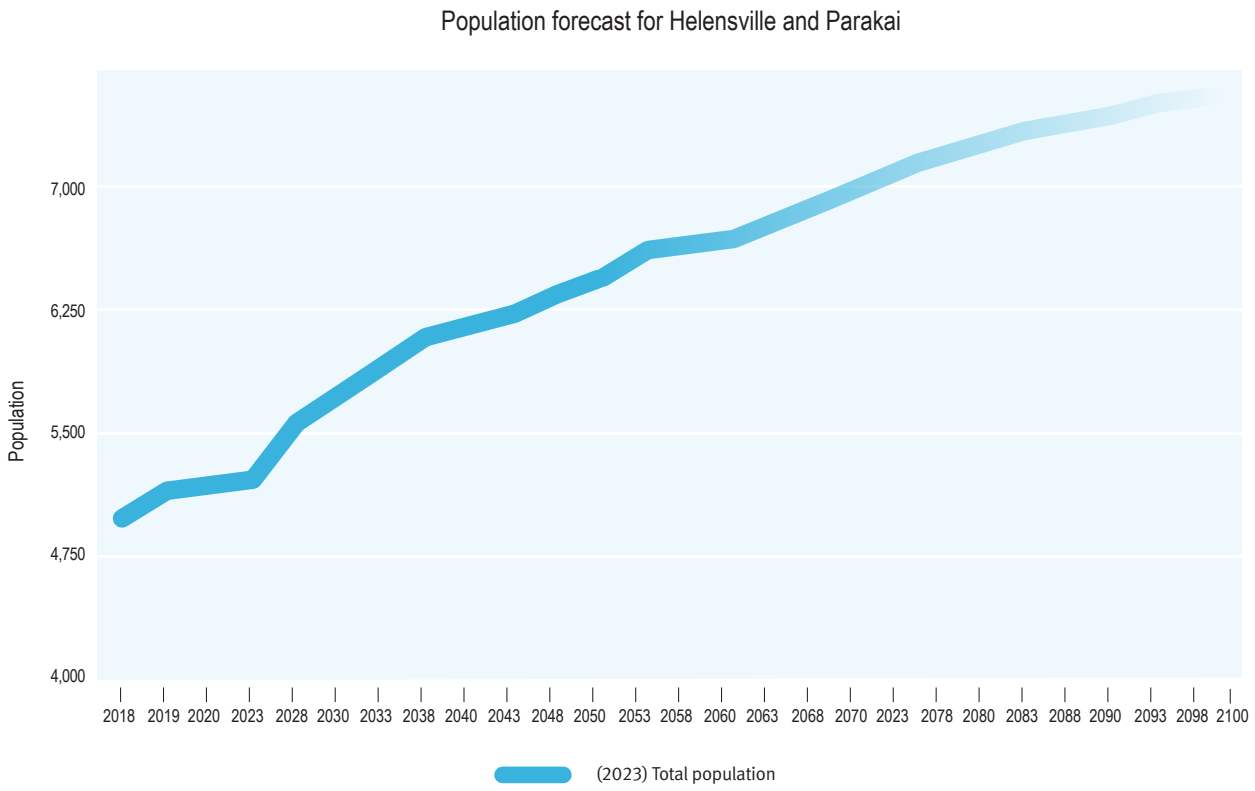


Figure 1 - Population forecast for Helensville and Parakai

Note: This is the Helensville-Parakai population projection with Auckland Council's population data released in 2024. All population projections are theoretical estimates, however uncertainty is greater after 2051.

The orange area below shows the area under consideration in this strategy:

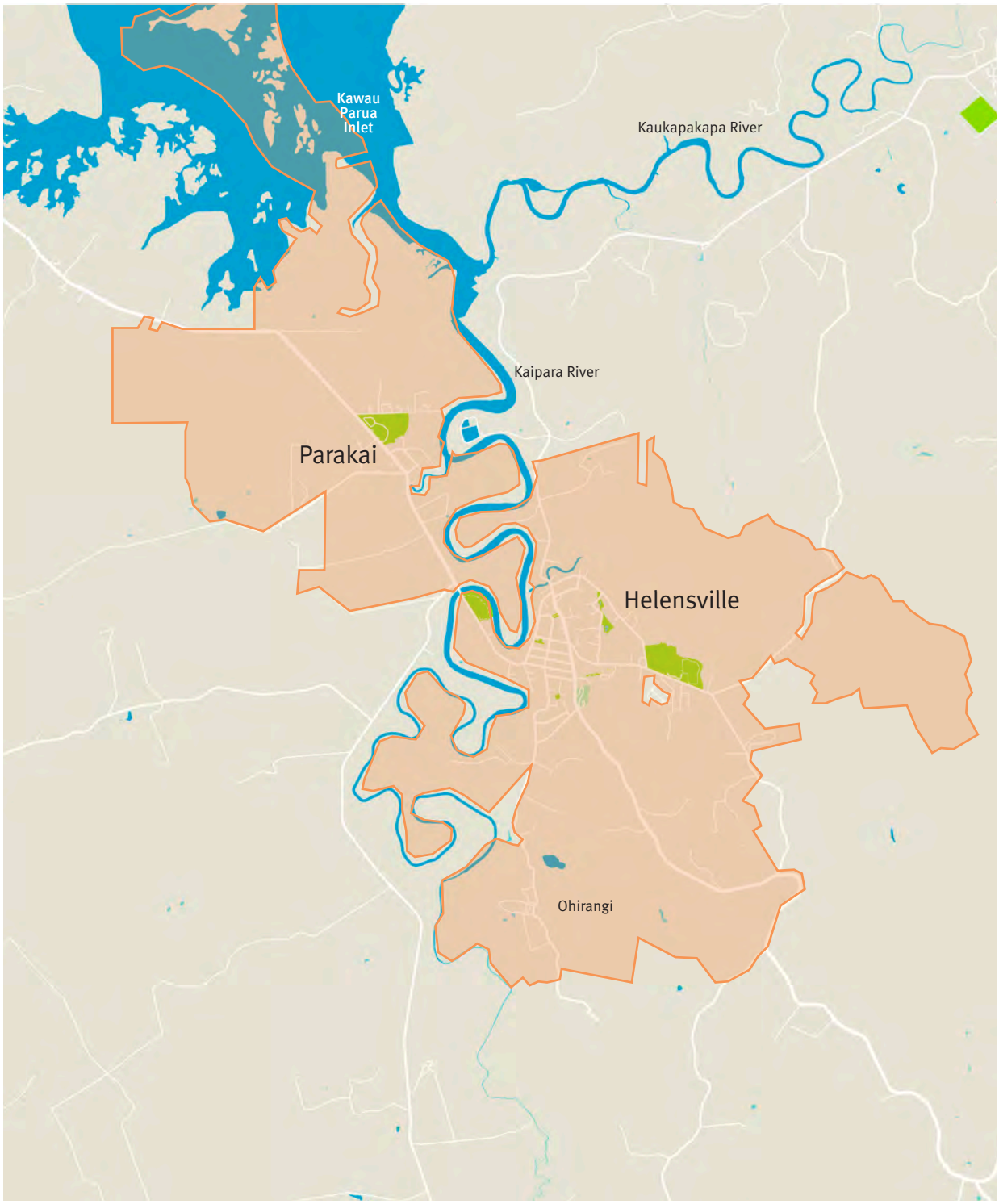


Figure 2 - Helensville and Parakai servicing strategy area

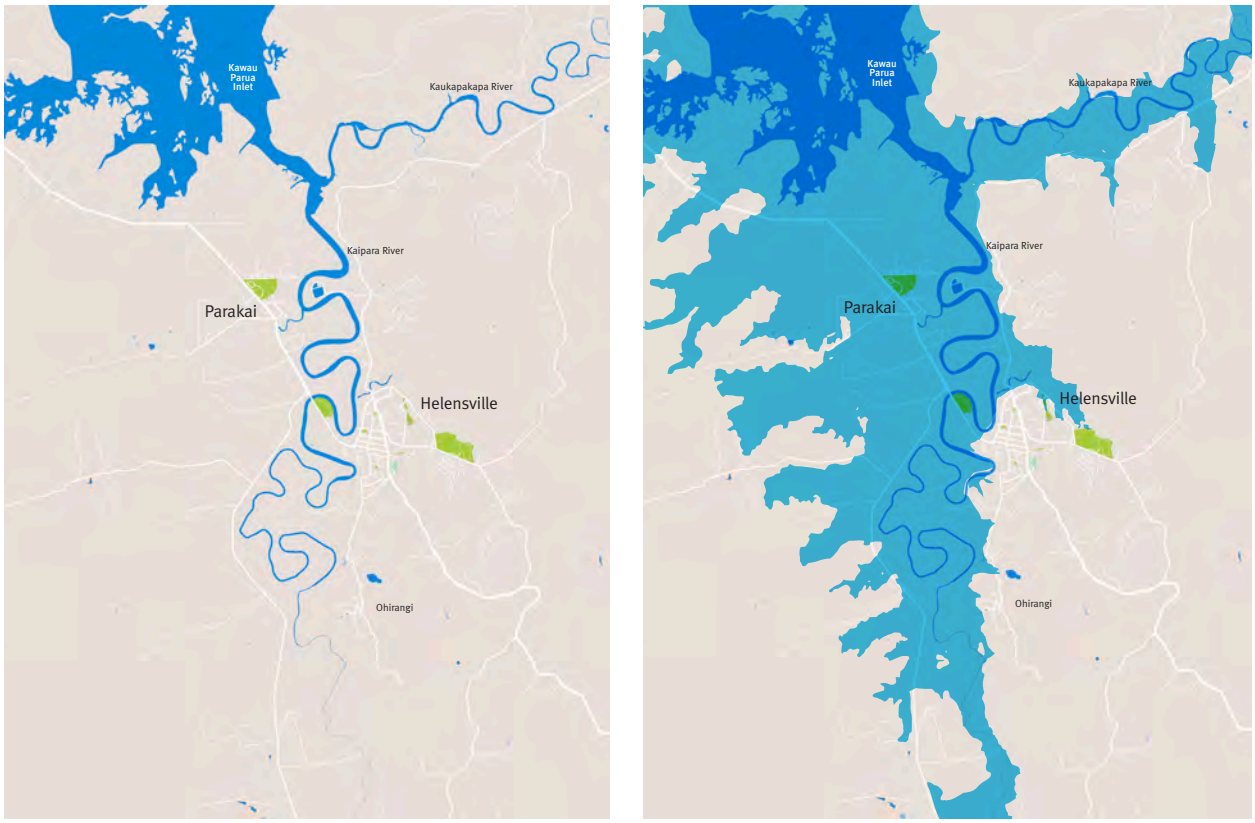
Demand for water in the area, is usually higher during drier summer months and the holiday season. The increasing population will naturally increase raise the demand for water and production of wastewater, for which we need to prepare by planning the infrastructure to stay ahead of growth.

Ngā whakāweawe ā-hurihanga āhuarangi, taupori hoki ki te putunga me te hiahiatia |
Climate change and population impacts

In addition to the growing population, we need to be prepared for the impacts of climate change including more variable rainfall and extended drought periods, which will impact on the availability and quality of surface-water sources, as noted above.

The seasonal distribution of rainfall is projected to change noticeably in Auckland, with spring rainfall expected to decline and autumn rainfall expected to increase. Increasingly dry periods in spring and summer, combined with heavier rain in autumn and winter, means that although the total annual rainfall may not change significantly, we will still need to plan for the challenge of increased frequency and intensity of droughts, storms and floods. We anticipate greater vulnerability to El Niño and La Niña weather patterns, meaning that we must prepare for increasing situations of not enough and too much water as we plan our investments in the future.

Low-lying areas at risk of sea-level rise in Helensville and Parakai



Current sea levels | **One metre sea-level rise**

Figure 3 - Flood risk areas

Climate change will impact surface-water supplies such as Helensville's, and rainwater tanks, particularly for those with smaller tanks, which are more likely to spill over in wet periods and run dry in dry periods than larger tanks. Intensification can make it difficult for households to collect sufficient rain (with limited room for large enough tanks) to support full domestic water use.

Figure 4 - Mangakura Dam Feb 2023

An alternative source of water is needed for Helensville and Parakai to increase the resilience against climate change and projected population growth in the area. The water supply situation may be made worse by water take consent conditions limiting the amount of water that can be taken, or requiring stream compensation flows. These types of conditions can enhance the natural environment, but are likely to reduce the availability of water for use, increasing the need for an alternative source.

Climate change also has an impact on water demand. Aucklanders use more water when it is hot and dry, particularly those who live in homes with gardens and pools. This is also true of some businesses and organisations like schools and councils which need to keep lawns, sports fields and parks thriving in dry weather.

Our wastewater treatment plant in Helensville is at a high risk of impact from climate change too. Sea-level rise and tidal inundation within the next 20 years will have severe impacts on the WWTP. We are looking at options for the wastewater treatment plant and while we have not come up with a solution yet, the most likely scenario is retreating from where it is and building a new treatment plant in a better location.

15

Wai

Water

History of water supply

From the early 1900s the growing borough of Helensville had begun to experience water shortages. Several sources were inspected and in 1913 a concrete water supply dam was constructed on the upper Mangakura Stream, just south of the town. This source became insufficient for Helensville's needs within a decade. Investigations into the possibility of taking underground water from the sand country west of Te Pua were undertaken in 1930; however, the iron and other mineral contents of such water made it unsuitable. In 1934 a second larger dam was constructed on the Mangakura Stream greatly increasing storage capacity. The construction of a larger lower-level earth dam on the Mangakura Stream was proposed from the mid-1950s and commissioned in 1964, raising the total storage capacity to approximately 107 million litres. In 1975 a pumping station utilising the underground water resources of the Sandhills Wetland was finally constructed near Bradley Road, Wharepapa.

Water supply system today

Helensville's water supply system is an operationally and geographically separated system from the wider Auckland metropolitan system. Water is abstracted from the two sources of Mangakura Dams and Sandhills Wetland. Both sources supply the Helensville Water Treatment Plant (WTP), where water is treated and stored onsite in two treated water reservoirs. The WTP operates to maintain levels in the reservoirs at a set point. From the reservoirs, water is supplied to the Helensville distribution system under gravity.

As of 2022, we supplied water to about 1,700 connection points and a population of approximately 4,600. Note that the number of people connected to our network is lower than the total population (approximately 90 per cent) because people can choose to stay off the network and use their own water tank.

Helensville and Parakai water supply system

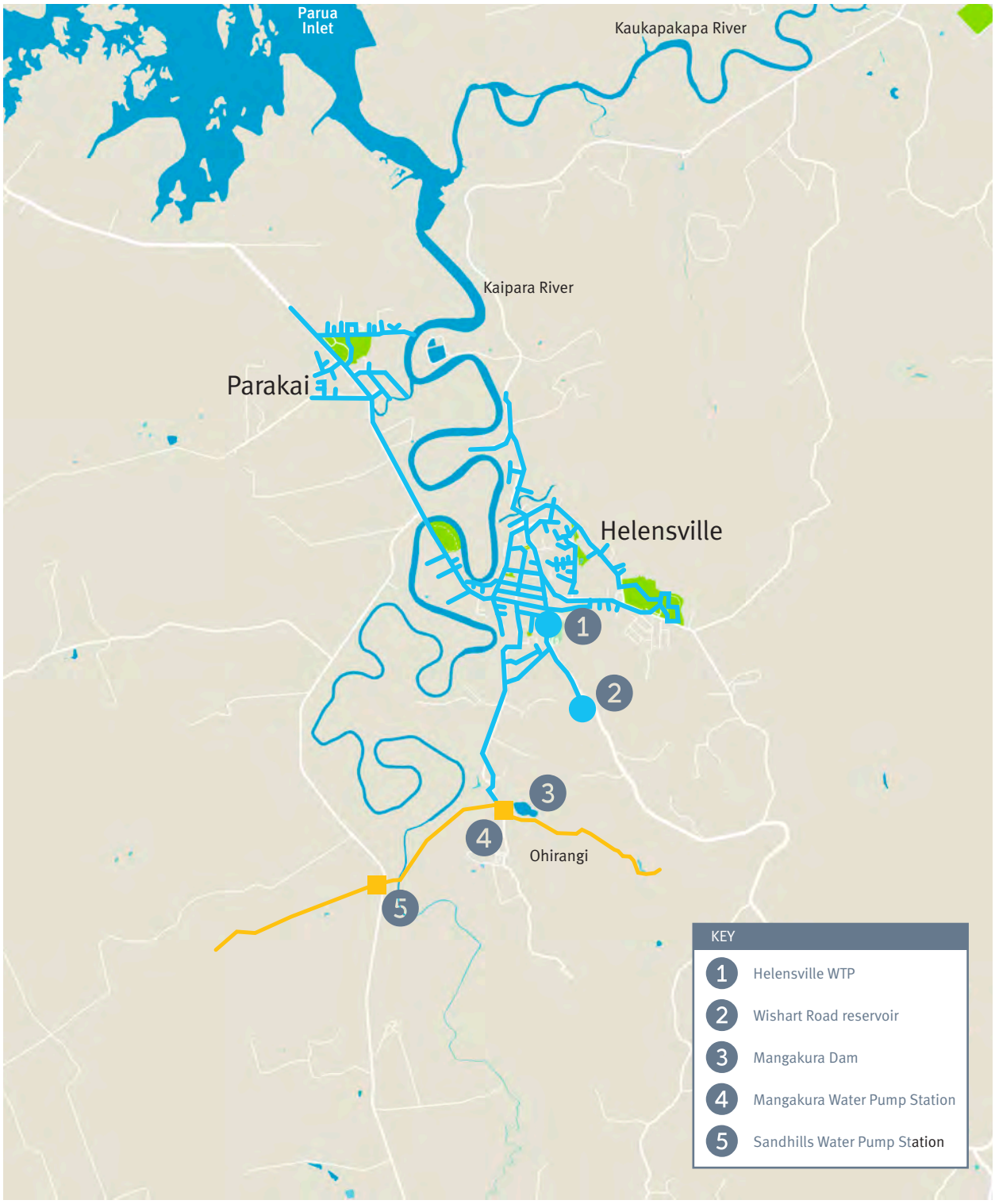


Figure 5 - Helensville and Parakai water supply network

Figure 6 - Mangakura Dam weir

Water quality

The water quality from the dam and spring-fed wetland can vary significantly following large rainfall events. Raw water quality data shows that the water abstracted from both sources contains high levels of iron and manganese, and both sources are subject to elevated levels of cyanobacteria and naturally-occurring organic compounds.

Algae and cyanobacteria levels are variable in the Mangakura Dam and can lead to elevated levels of odour-causing compounds, which can cause water to taste different, mainly throughout the warmer months of the year.

Water efficiency

We use universal metering to measure water use by all legal connections on the water supply network. All water meters are read every second month and water consumption for alternative months is estimated.

Water metering assists us in providing the data which is required to manage and operate the water supply system. Suitable water-use statistics contribute to promoting the wise and efficient use of available water, optimising network design and operation, and managing revenues and costs.

Watercare has a water efficiency plan covering all of Auckland, committing us to achieve our gross per-capita target of 253 litres per person per day by 2025. There are four pillars to this plan, as follows:

- Focus Area 1: Reducing leakage
- Focus Area 2: Improving oversight from source to tap
- Focus Area 3: Pressure management
- Focus Area 4: Residential, community and commercial water efficiency.

The responsibility for being water efficient falls to both Watercare and our customers. With improved digital oversight of our network and our customers' consumption, we are increasingly able to provide useful advice on how we all might waste less water over time.

Post 2025, Watercare's water efficiency commitments align with the Auckland Water Strategy Water Security Targets:

Consumption (demand)

2025	**≤253 litres consumption per person per day (gross per capita consumption, network)**
2030	**≤247 litres consumption per person per day (gross per capita consumption, network)**
2050	**≤225 litres consumption per person per day (gross per capita consumption, network)**

Figure 7 - Helensville and Parakai water sources are at risk from severe weather events

Water use and availability

Figure 8 below shows the amount of water we abstracted and treated from all water sources in the area and the amount that was used during the last five years. The green line shows total consumption, which is rising due to increasing demand.

Total consumption is rising due to increased residential and commercial consumption

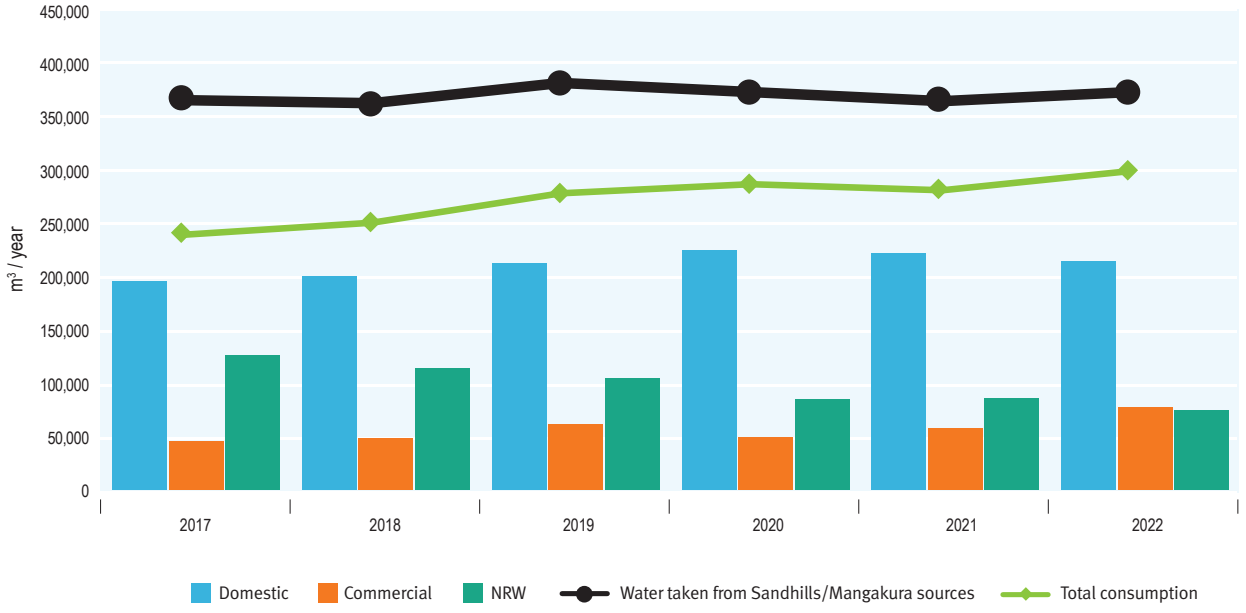


Figure 8 - Water supply and consumption in Helensville and Parakai

We have become more efficient with our water use over time by reducing water waste. This reduction has been achieved through reducing leakages, implementing compliance monitoring to reduce unauthorised use and water conservation within the community. Although we are more efficient with our water use, we will still need a new source due to growth, and to improve our resilience against climate change impacts on supply.

The average water use during the period 2017 to 2022 is summarised in the table and pie chart below:

Water Use	thousands of litres per day	megalitres per year
Domestic	578	211
Non-domestic	156	57
Tankers	16	6
Irrigation (non-potable water)	5	2
Network non-revenue water	271	99
Total	1027	375

Future demand

The water demand in Helensville and Parakai will be driven (at least in part) by:

- **Urbanisation and population growth**

  The number of residents in the area is a key driver of water demand. As the population increases, so does the demand for water for residential, commercial and construction purposes.

- **Climate and weather patterns**

  Extended dry periods mean we need to provide additional storage capacity and resilient supply that is not dependent on surface water. We need to prepare to provide water for tanker filling for emergency supply to residents' houses with rain tanks during droughts.

- **Network losses**

  Water losses in the network result in increased demand for water from our sources. In Helensville and Parakai currently we lose approximately 20 per cent of the water through the network before it reaches residents' houses. We will gradually renew the older parts of the network to reduce these losses.

- **rain tanks, water efficiency initiatives and other innovations**

  to balance the emphasis on large public infrastructure options.

Based on the projected population of 6,500 in 2050, peak daily water demand will increase to approximately 2,470 m^3 per day on average [fig below]. Our current water take consents allow us to take a maximum of 2,500 m^3 of water per day from the two water sources in Helensville. This indicates that in the short to medium term, we can take enough water to meet the needs of the community. However, we are limited by how much water is available to us.

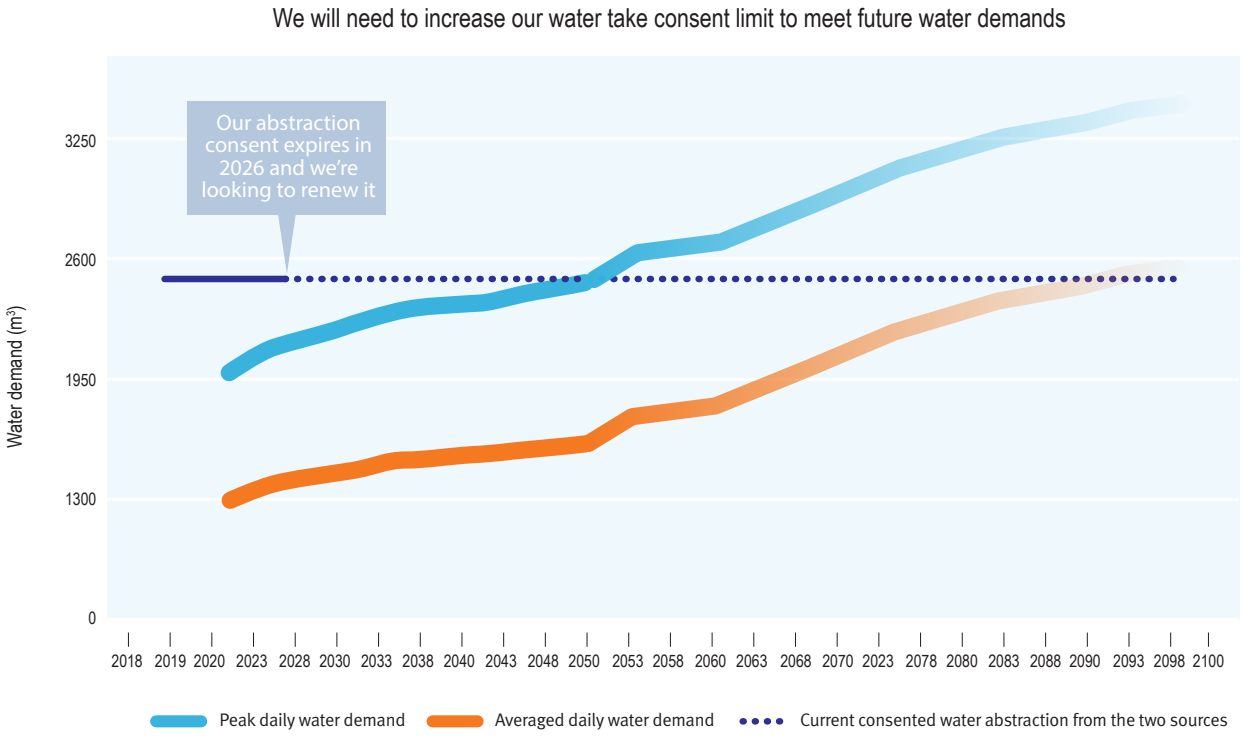


Figure 9 - Future water demand: based on Council population projections until 2050, then average growth scenarios

While currently there is adequate water from our Ohirangi and Sandhills sources most of the time, both are surface water and are highly susceptible to the impacts of climate change, as we have seen in the past few years. Extended dry periods reduce the amount of water available to take for town supply, and severe storms can significantly increase debris, mud and sediments in the water, making it challenging for our treatment plant to adequately treat the water.

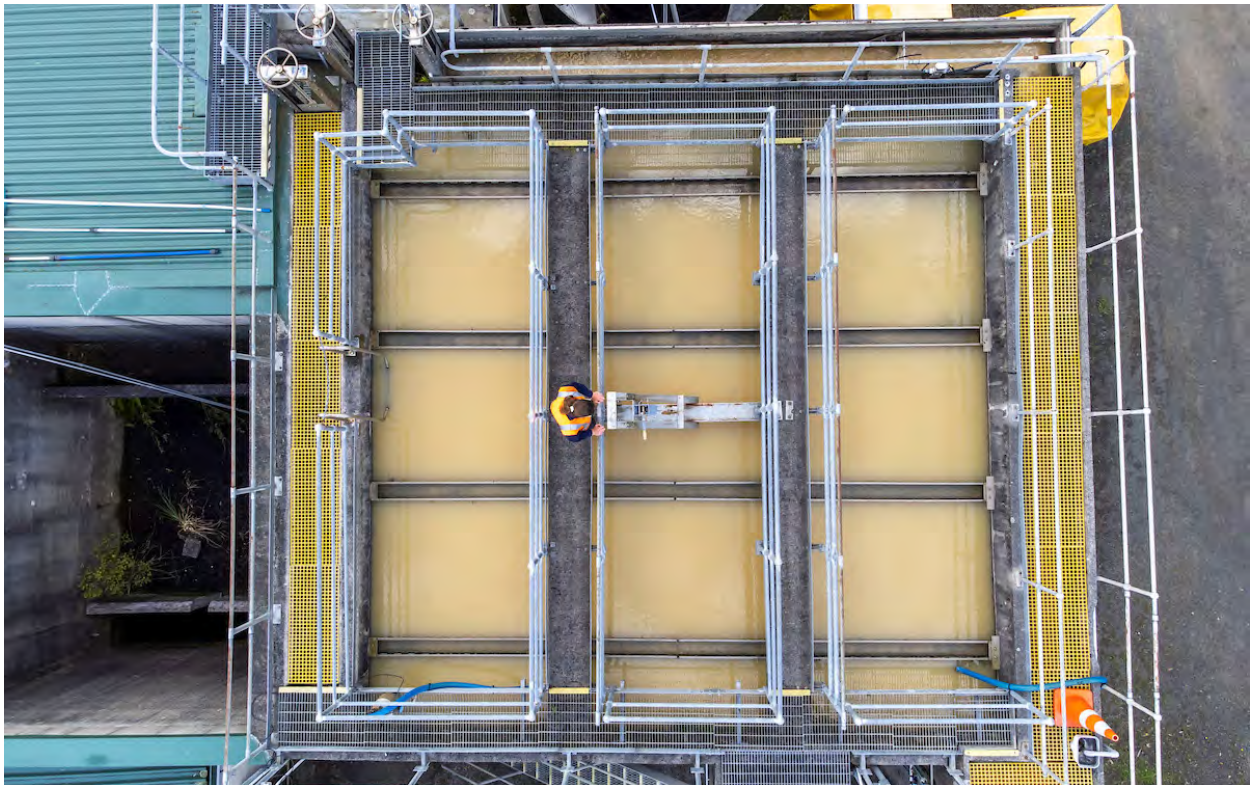


Figure 10 - Helensville WTP after storm, February 2023

Multiple local solutions – such as rain tanks, water efficiency initiatives and other innovations - may be better options for the future than large public infrastructure options. This will require working with the community to develop the most resilient strategy for the Helensville and Parakai area.

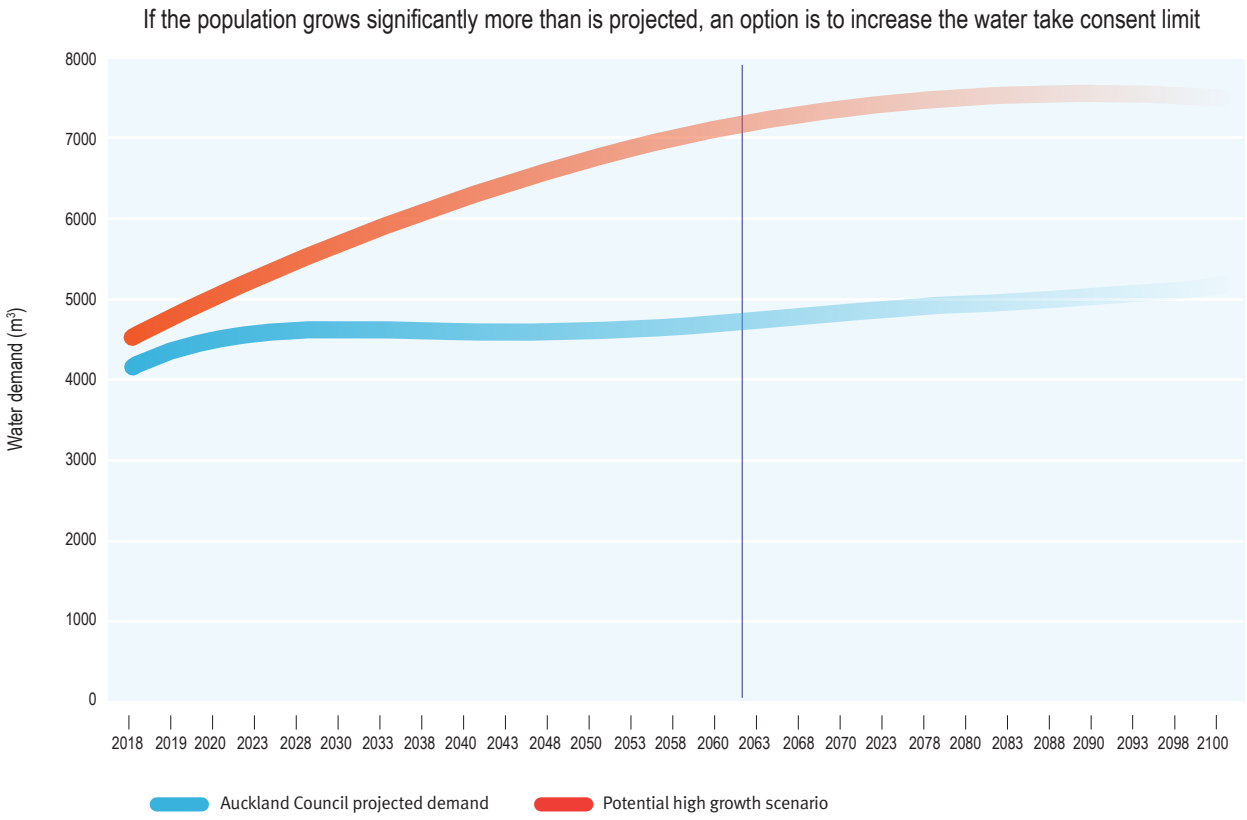


Figure 11 - Demand projected to 2100, based on Council population projections until 2050, then average growth scenarios

Whakarāpopototanga o ngā kōwhiringa putunga wai

Summary of water supply options

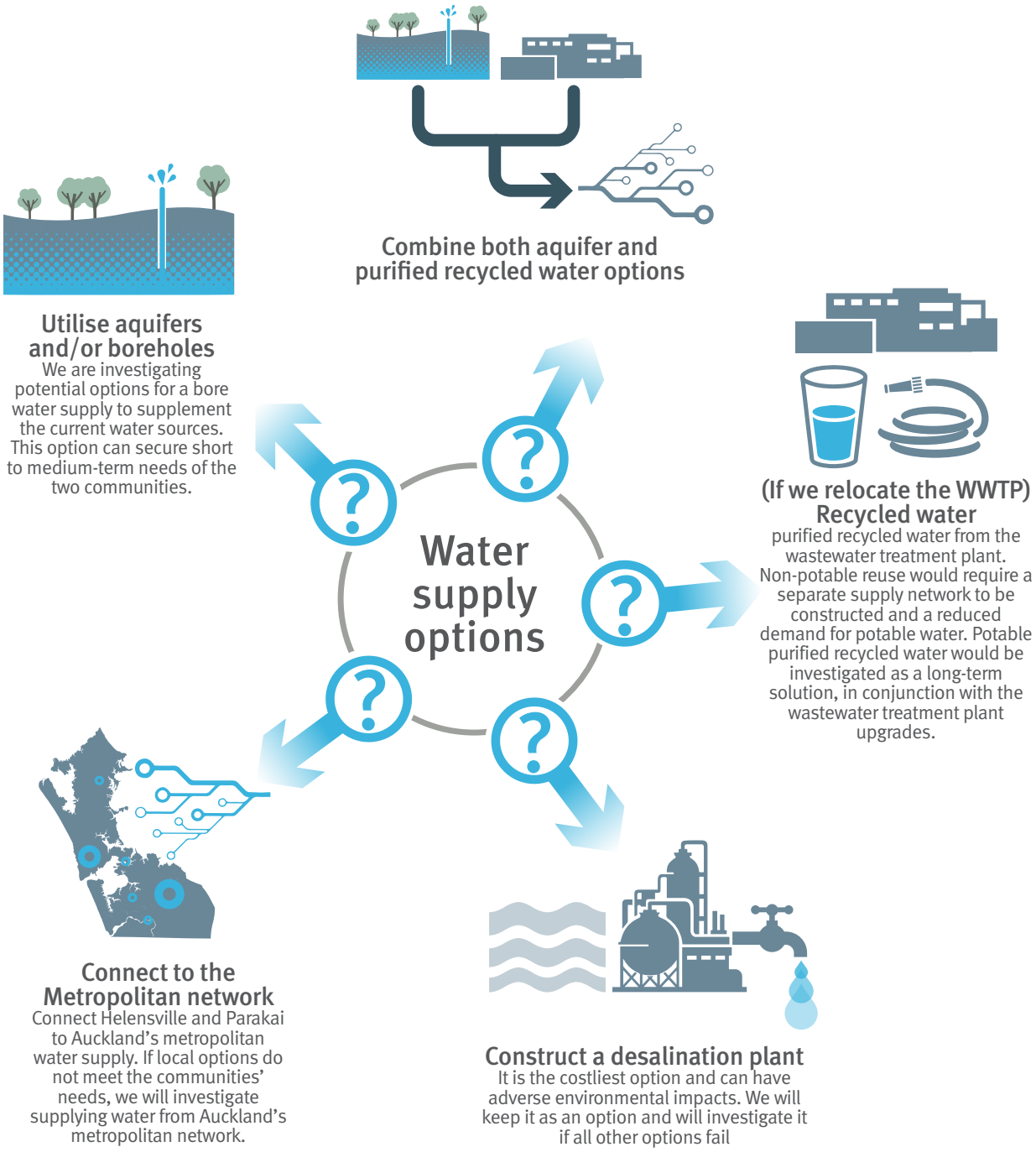


Figure 12 - Identified options for Helensville water supply

Groundwater

The aquifer in Helensville and Parakai is accessed by the local community privately for residential supply and by private water suppliers, for those not connected to the Watercare water network. An Auckland Council study showed that the groundwater level at Helensville in 2020 indicated no noticeable effect of the drought. This result was somewhat counter-intuitive as shallow, unconfined sands would be expected to be greatly affected by climatic conditions. Overall, the impact of the 2020 drought on water levels in the Helensville aquifer was less significant than many other aquifers in the region. This indicates that a groundwater source may be a suitable option to provide the resilience that our water supply needs.

We have been investigating a number of potential locations for using groundwater. This work is ongoing and requires careful consideration, including impacts of groundwater take on seawater intrusion into the aquifer, water allocation and long-term availability, and distance from our treatment plant. We also note that groundwater is a limited resource which is shared by all the users within the aquifer (allocation regulation is undertaken by Auckland Council). As a source of water for the region, groundwater could be an important part of the solution.

Recycled water

Recycled water has considerable potential in the medium to long term as an integrated water solution that provides benefits to both water and wastewater systems. As a source:

- It provides a climate-resilient supply that is relatively non-rainfall dependent.
- It is resource efficient as it preserves natural sources of water and maximises the amount of water flows in the natural creeks and waterways.
- It reduces the volume of treated wastewater discharged to the harbour.

As will be discussed in the wastewater section, we may need to relocate our wastewater treatment plant from its current location due to the potential risks we will face within the next 10 to 20 years. This creates an opportunity to develop an integrated water and wastewater system, where highly treated and purified wastewater would be beneficially reused. Options include (1) a local system to directly use Helensville's purified wastewater for local use, and (2) a regional system where purified wastewater from neighbouring wastewater treatment plants is stored at a central storage facility and used as a water source when needed.

Further engagement with local iwi and the Helensville and Parakai communities will be needed on the topic to understand whether these or any other options would be feasible. In addition, there is currently no regulatory framework for the potable use of purified recycled water. Further engagement with the regulators of water supply in Aotearoa New Zealand will be required before implementing this option.

Desalination

Desalination is often considered as an option if none of the more natural solutions are possible. This is because desalination has a high cost and is very energy intensive. The cost of desalination increases if it needs to be accompanied by a new renewable energy source (such as solar or wind).

While we keep desalination as an option for the future, it is probably not a suitable one for Helensville. Desalination sources typically need a deep-water intake to take in high-quality salt water, with minimal variability in salt concentration. The estuarine nature of the waters in the Kaipara Harbour means that the harbour does not have a stable salinity, is not deep enough, or does not have a suitable geology for the construction of an intake. A suitable site is also needed to discharge the hypersaline brine by-product of the process. The sensitive aquatic environments of estuaries tend to be unsuitable for this. The construction of an intake and outfall for desalination is very costly, which means it is usually only viable for a very large plant. If desalination were feasible, it is more likely to be part of a bigger solution to supply water for the wider Auckland region.

Connecting to the metropolitan system

If it isn't possible to find a local source of water to provide the level of water security the Helensville and Parakai communities need, supplementary supplies could be obtained from the metropolitan system. This option is not ideal or preferred, as it will increase the demand on our metropolitan water supply and sources, and will also need a long pipeline, which is costly in terms of both money, disruption, potential water loss during conveyance and carbon-emission equivalents. As noted in our introduction, the preferred approach to servicing non-metropolitan communities is to find local options unless there is a very strong health or environmental reason to do otherwise.

Rainwater harvesting and tanks

Rainwater tanks provide non-reticulated water and augment supplies to about 200 premises in and around Helensville and Parakai. There is a Watercare tanker filling station for drinking water located in Helensville on Mill Road.

This type of storage has been relied on for most rural and coastal areas in New Zealand. In terms of eco-conservation benefits it is an effective utilisation method of natural resources. In times of low rainfall, the Helensville community sources additional drinking water from private supplier collection points to top up the rainwater tanks. Experience elsewhere has been that during drought, communities might need to wait weeks for top-up water to be supplied. Rainwater harvesting has some benefits, but it is prohibitively expensive to retrofit existing households with such systems, particularly in intensively developed areas. However, it could be a viable source of supplementary water for new dwellings. The introduction of rainwater harvesting would need the support of the relevant stakeholders, and tanks would need to be of a size large enough to make a difference during the hottest and driest months of summer. Depending on the uptake and make-up of any rain tank installation provision for the community, peak-day volumes and maintaining pressure for firefighting would need to be considered to ensure that there is sufficient water if all rain tanks were not available for use.

Considerations

The level of water resiliency for the Helensville and Parakai communities is relatively low. This is mainly attributed to the limited size of the catchment areas and a reliance on surface-water sources for public supply. Consequently, water availability will be more vulnerable to fluctuations in rainfall patterns, increasing the risk for climate-dependent yields. This means that while there may be enough water to supply the communities and expected growth over the shorter term, the likelihood of these communities experiencing restrictions or outages in a drought or storm might be higher than for other areas of Auckland.

Renewal of the water take (consent expires in 2026) may require compensation flows in Ohirangi and Mangakura streams. Reconsenting of the take from the Sandhills Wetland may be subject to improved monitoring and understanding of the drought resilience of the source, stream ecological values, as well as water demand and usage.

Local iwi have identified Sandhills Wetland as an environmental taonga (treasure). In addition, Ohirangi Stream provides a safe and suitable natural habitat for local fish and native eels. Our future activities must consider these important ecological aspects and the environment that we are operating in, to ensure we are reducing our impact on the environment.

Waipara
Wastewater

History of wastewater treatment

The Helensville wastewater treatment system was built in the 1970s. Watercare inherited the Helensville WWTP in 2010 when the Rodney District Council amalgamated with the rest of Auckland's local councils to form Auckland Council. At that time, the treatment plant used two oxidation ponds to treat the wastewater of Helensville and Parakai before discharging the treated wastewater into the Kaipara River, a major tributary of the Kaipara Harbour.

A discharge permit allowed the discharge from the treatment plant to the Kaipara River subject to meeting specific criteria, including discharge volume and discharge quality limits. Despite making substantial changes to how the treatment plant operated and its technology, we struggled to achieve the discharge standards of the resource consent due to the treatment plant receiving high inflows during storm events. As a result, we upgraded the treatment plant in 2023 by installing containerised treatment systems onsite. The upgrade has resulted in a significant improvement in the quality of treated wastewater that we discharge.

Wastewater system today

The Helensville wastewater system currently serves a population of approximately 5,000 people in Helensville and Parakai. It consists of two collection networks and eight pump stations. The picture below shows the Helensville and Parakai wastewater network.

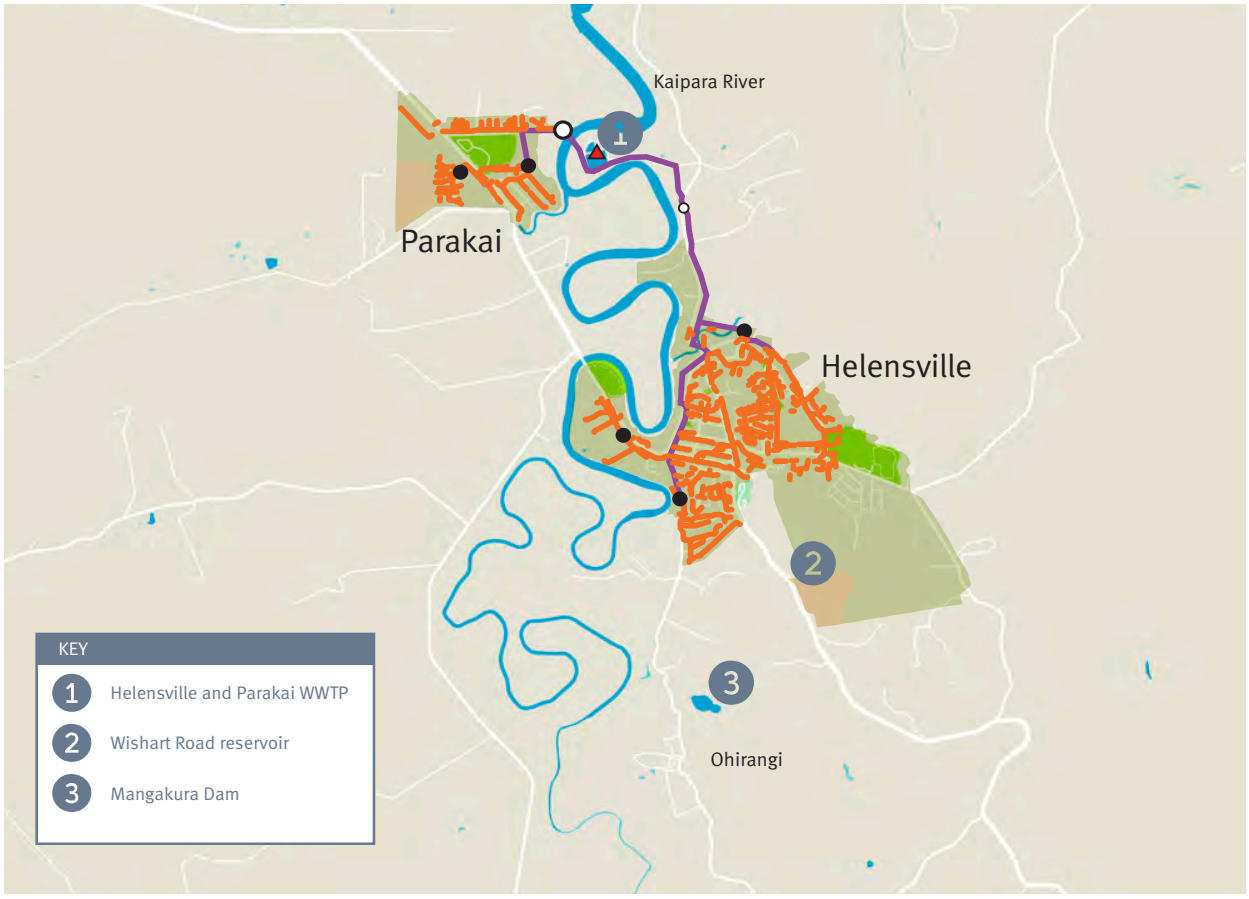


Figure 13 - Helensville and Parakai wastewater system

There are eight engineered overflow points (EOP) in the network (five in the Helensville network and three in the Parakai network). These are regulated under a regional network discharge consent (NDC).

The Network Discharge Consent (NDC)

The NDC was granted on 17 June 2014, for 35 years. It authorises dry- and wet-weather overflows from our wastewater networks. It permits for 'an average of no more than two wet-weather overflow events per engineered overflow point per year, or an alternative discharge frequency that can be shown to be the best practicable option if two overflows cannot be achieved for an engineered overflow point.'

The NDC requires preparation of an annual network performance report and a six-yearly wastewater network strategy which should include a remedial plan for the wastewater networks. The remedial plan outlines the work to be undertaken in the next six-year period, to move the wastewater network closer to compliance with the terms of the discharge consent limit of two overflows per engineered overflow point on average per year. The first wastewater network strategy was completed in 2023 and can be accessed through [www.watercare.co.nz/Water-and-wastewater/Wastewater-network-strategy-2023].

The two wastewater networks convey wastewater to the Helensville WWTP, located on the right bank in the bend of the Kaipara River, across from Parakai, five kilometres from the harbour.

Receiving environment – where Helensville and Parakai's treated wastewater goes

The current discharge consent condition for the Helensville WWTP permits a maximum of 5,500,000 litres of treated wastewater per day to be discharged into Kaipara River on an outgoing tide. The discharge consent expires in 2027.

Kaipara River is of moderate size, draining a catchment of 270 square kilometres extending to the Waitākere Ranges in the south and Riverhead Forest in the east. It flows to Kaipara Moana (Kaipara Harbour).

Kaipara River is a taonga and treated wastewater discharges reduce availability and safety of kaimoana (seafood) due to disrupting the natural salinity levels and quality of the water. The Kaipara River is sacred to iwi and we need to further protect and progressively reduce discharges for the generations to come.

Figure 14 - Helensville WWTP June 2023

Water quality improves as we move away from Kaipara Bank towards Kaipara Head

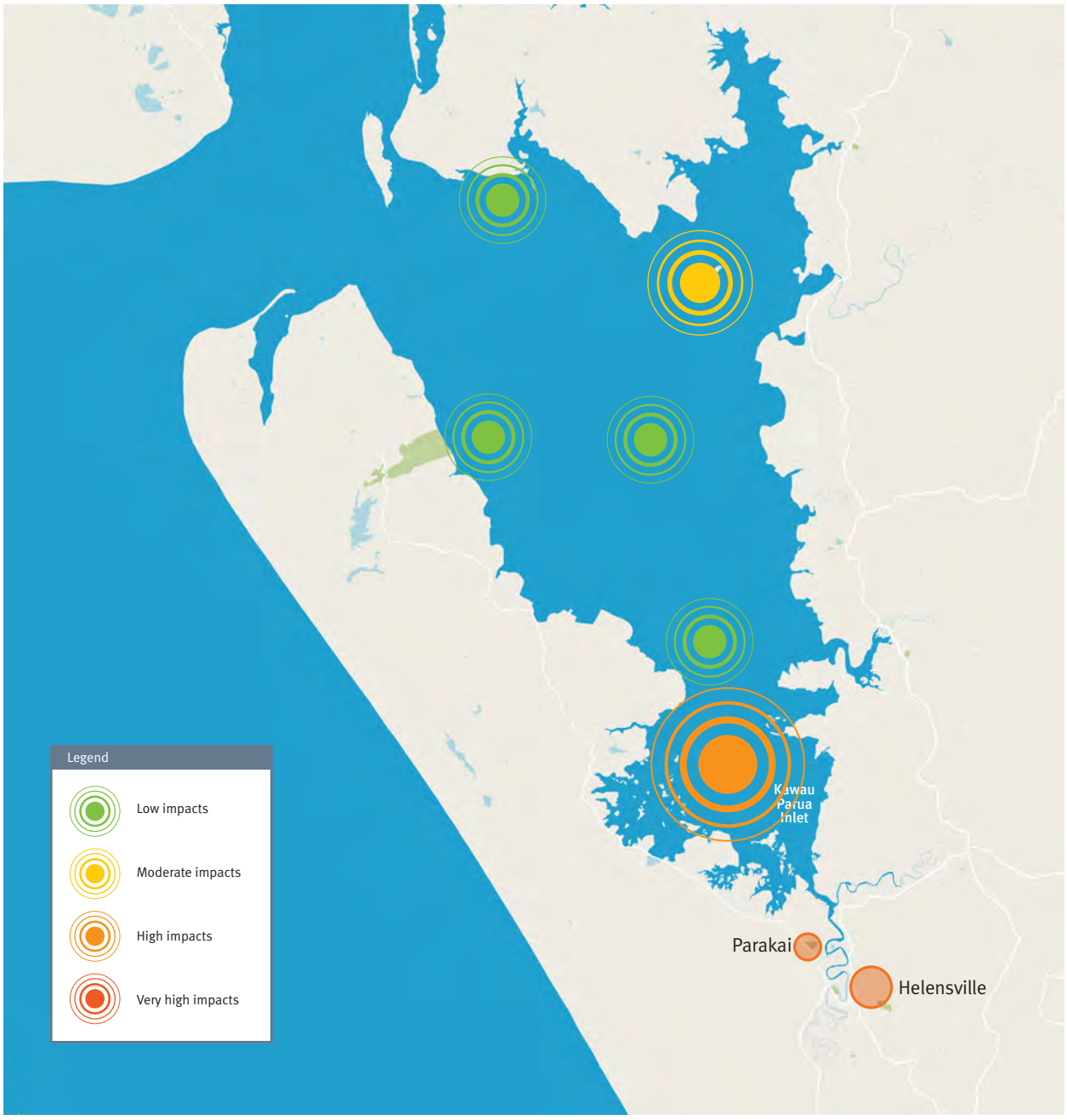


Figure 15 – Estuary health indicator of Kaipara Harbour

The environmental condition of Kaipara Harbour shows an improvement as one moves farther from the mouth of the Kaipara River towards Kaipara Head (Figure 15). The reduced health in proximity to the river mouth can be primarily attributed to the extensive modification of the river catchment area, where approximately 90 per cent of the land cover is no longer comprised of native wetlands or vegetation. This change has led to elevated levels of soil erosion and sedimentation in both the river and the downstream section of the harbour. There are no Safeswim monitored beaches in Helensville or Parakai so regular environmental monitoring is not available.

[Source: www.lawa.org.nz/explore-data/auckland-region/estuaries/kaipara-harbour-south/]

Wastewater treatment plant upgrade

As an old and rural wastewater treatment system, the Helensville WWTP had received inadequate care and attention for decades. There were high sludge levels in the ponds, increasing anaerobic digestion and ammonia load. As a result, the plant had been performing poorly for years, causing breach of its discharge consent conditions, highlighted by the several abatement notices issued by Auckland Council since Watercare inherited the plant from Rodney District Council in 2010.

We committed to improve the situation to meet our regulatory obligations and protect the public and ecosystem health. In addition to improving the access road, de-sludging and other remedial works, we invested $17 million to upgrade the WWTP to an innovative technology. This was completed in 2023 and has vastly improved the quality of the treated wastewater by effectively removing ammoniacal nitrogen, which is a toxic pollutant to humans and the ecosystem. The upgrade means the plant is now better able to cope with peak flows in wet weather.

The technology was tested at our innovation centre at the Māngere WWTP, which gave us confidence that it was the right solution for Helensville.

Figure 16 - Upgrading the Helensville Wastewater Treatment Plant

Figure 17 - Helensville WWTP June 2023

Wastewater demand

Figure below shows the monthly average wastewater that was received by and discharged from the Helensville WWTP since January 2022. It shows the significant impact of wet weather on the wastewater system in Helensville and Parakai.

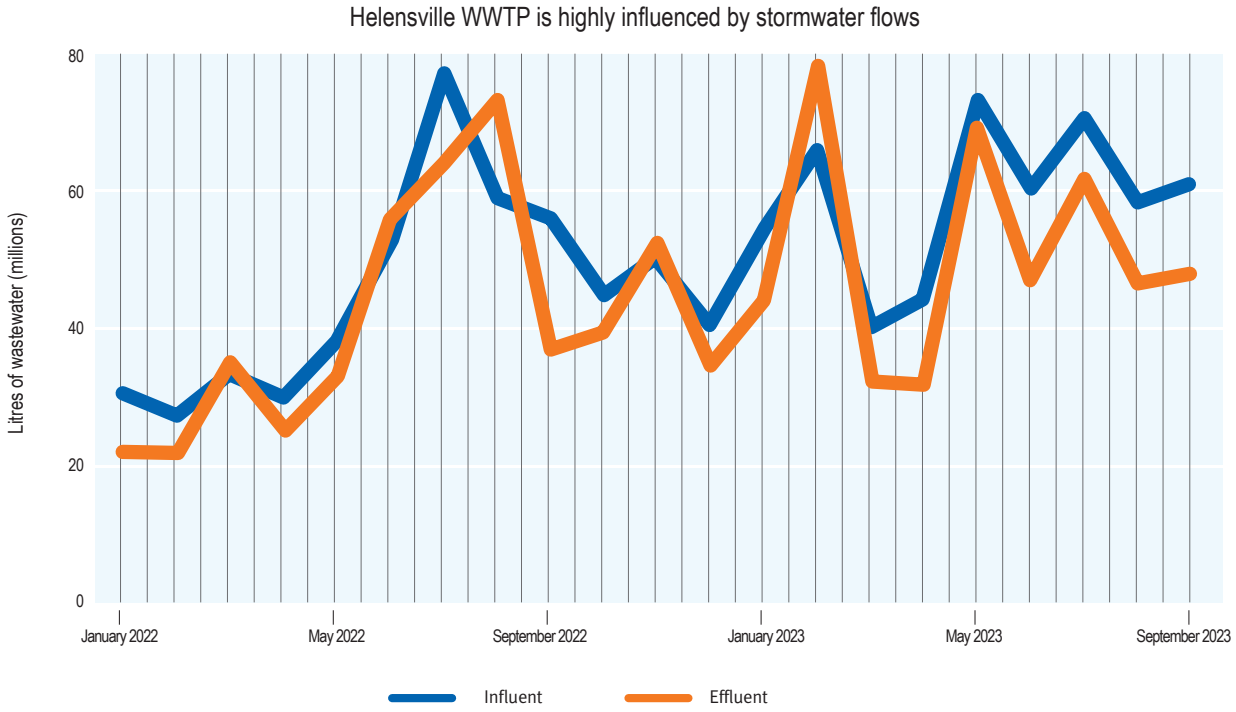


Figure 18 - Average monthly wastewater flowing to and from Helensville WWTP

As discussed earlier, assuming no significant change in the development momentum, our population forecast modelling indicates that approximately 6,500 people will be living in the area by 2050. Allowing a gross per-capita wastewater production of 435 litres per person per day (including 50 per cent stormwater inflow and infiltration), adding 1,500 people to the community served would produce 652,500 litres of wastewater each day, during rainy periods.

The plant installed as part of the recent upgrades can treat 1,500,000 litres of wastewater each day, so we have sufficient wastewater treatment capacity. In addition, the new technology allows additional containerised modules to be simply attached to the existing ones, if more treatment capacity were needed. Our challenges are in the discharge of treated wastewater, and resilience against natural hazards.

Wastewater system challenges and opportunities

Location of the treatment plant

The Helensville wastewater treatment ponds were commissioned in 1975, during a period when oxidation ponds were globally accepted as an effective wastewater treatment system. The oxidation ponds in Māngere were commissioned in September 1960 and other regions in New Zealand followed suit. Being adjacent to the receiving environment was a key consideration for a pond system to be low cost and efficient, at a time when we had limited knowledge about climate change and its potential implications. Therefore, our Helensville WWTP was constructed on the banks of the Kaipara River.

Being located within an oxbow bend of Kaipara River puts the treatment plant at a high risk from the forces that flow of river exerts on the pond embankment, as well as climate-related natural hazards. Recent investigations have indicated deteriorating conditions of the pond embankments. While there is no immediate risk to the integrity of the treatment plant or the network, the experience of the events in summer 2023 taught us that a combination of natural events (for example, a king tide and a hurricane at the same time) could bring about a hazardous situation.

Stormwater inflow and infiltration

The plant is susceptible to significant wet weather peak flows due to the high levels of infiltration and stormwater inflow into the wastewater system. During the events of 2023 summer, the plant had to bypass the majority of the inflow, meaning that untreated wastewater flowed into the environment. We believe that combined with high groundwater levels, deterioration in the pipes is causing operational problems for the plant.

While the recent upgrade to our WWTP addresses wet weather flows to a large extent, we will continue to reduce stormwater inflow and infiltration into the wastewater network to improve the effectiveness of our wastewater system.

Receiving environment

As discussed above, Kaipara river is a taonga and we need to contribute to improving the mauri of the awa. This can be achieved through careful considerations including reducing stormwater infiltration and enhancing the treatment plant's capacity so that untreated wastewater does not enters the river. We need to consider new ways of discharge (including discharge to land) or recycling and reuse of the highly treated and purified wastewater.

Wastewater servicing options

As discussed above, Helensville WWTP has enough capacity to support growth in the area for the next 30 years. However, it is an ageing asset and located at a highly risky location, susceptible to natural hazards. In the short term we will renew our discharge consent, and we will closely monitor the condition of the treatment ponds and perform any remedial works required to ensure the WWTP is operating safely.

We will also start the conversation with the community to discuss future options that include:

- Remediating and reinforcing the existing WWTP at its current location to safeguard it against climate change impacts in the medium to long term.
- Abandoning the existing WWTP and building a new plant somewhere else in Helensville.
- Abandoning the existing WWTP and connecting Helensville and Parakai wastewater networks to the metropolitan network.

As part of this discussion, we will explore potential future disposal options.

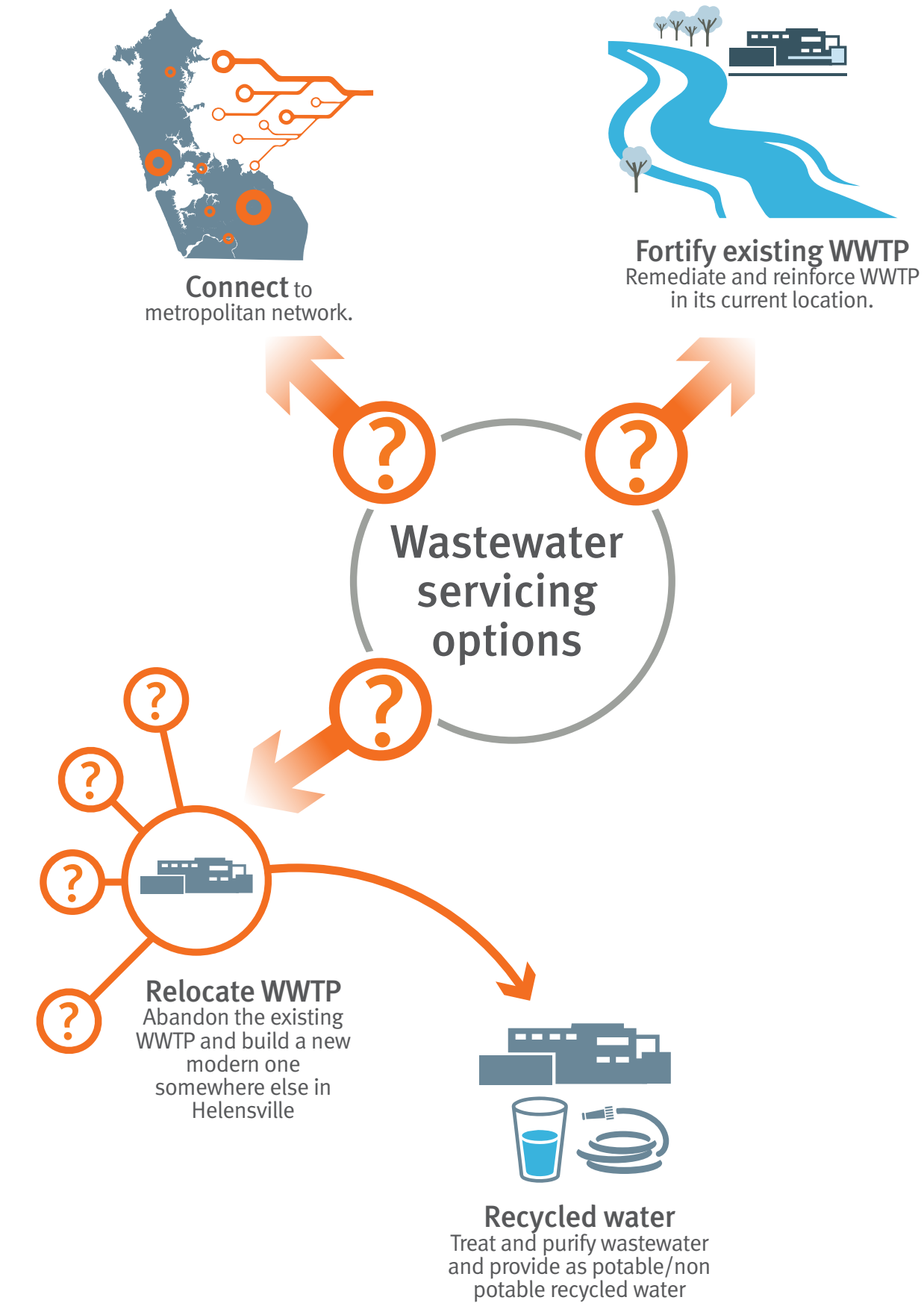


Figure 18 - Identified options for Helensville and Parakai wastewater disposal

Biosolids

Biosolids are a by-product of the wastewater treatment process. They are a sludgy substance which is generated by the bacteria used to break down the harmful parts of wastewater so that treated water can be safely discharged into the environment.

Figure 19 - Membrane aerated biofilm reactor (MABR) at Helensville's wastewater treatment plant

In Helensville and Parakai, Biosolids are not created in the same way as they are in more developed areas. Wastewater at the Helensville WWTP is conveyed into a pond system and the solids are removed intermittently. This process is manageable at the current population level of Parakai and Helensville. At the time a new WWTP is designed, and if it is developed using wastewater treatment which produces biosolids, we will develop a biosolids disposal/reuse strategy aligned to the new plant and population requirements.

Te whakamahere urutau
Adaptive planning

We can't predict all the changes we will face in any future state, but we do forecast service delivery based on current expectation and anticipated condition. There will be factors that impact the requirements of the Helensville and Parakai communities that are beyond our control. This means we need to keep our servicing options open for as long as possible while we identify the foundations for future decisions. Adapting to future scenarios requires a flexible approach that avoids the risk of locking decisions and investments into agreements that cannot be changed, or are not fit for purpose in future, for example building inappropriate infrastructure.

The Dynamic Adaptive Policy Pathways (DAPP) approach develops a series of actions over time (pathways). It is based on the idea of making decisions as conditions change, before severe damage occurs and as existing policies and decisions prove no longer fit for purpose.

Adaptation is a pathway. The end point is not only determined by what is known or anticipated at present, but also by what might be experienced and learnt when the future unfolds, and by responses to events. We develop a series of tipping-point triggers. For example, as the sea-level rises, the frequency of hazard events (such as flooding) might approach an agreed trigger. At this point we need to make decisions or take additional or different actions, and perhaps choose an alternative pathway to adapt to the new situation.

By exploring different pathways early and testing the consequences, we can design an adaptive plan that includes a mix of short-term actions and long-term options.

The plan is monitored against the tipping-point trigger for signals that a decision point is approaching to:

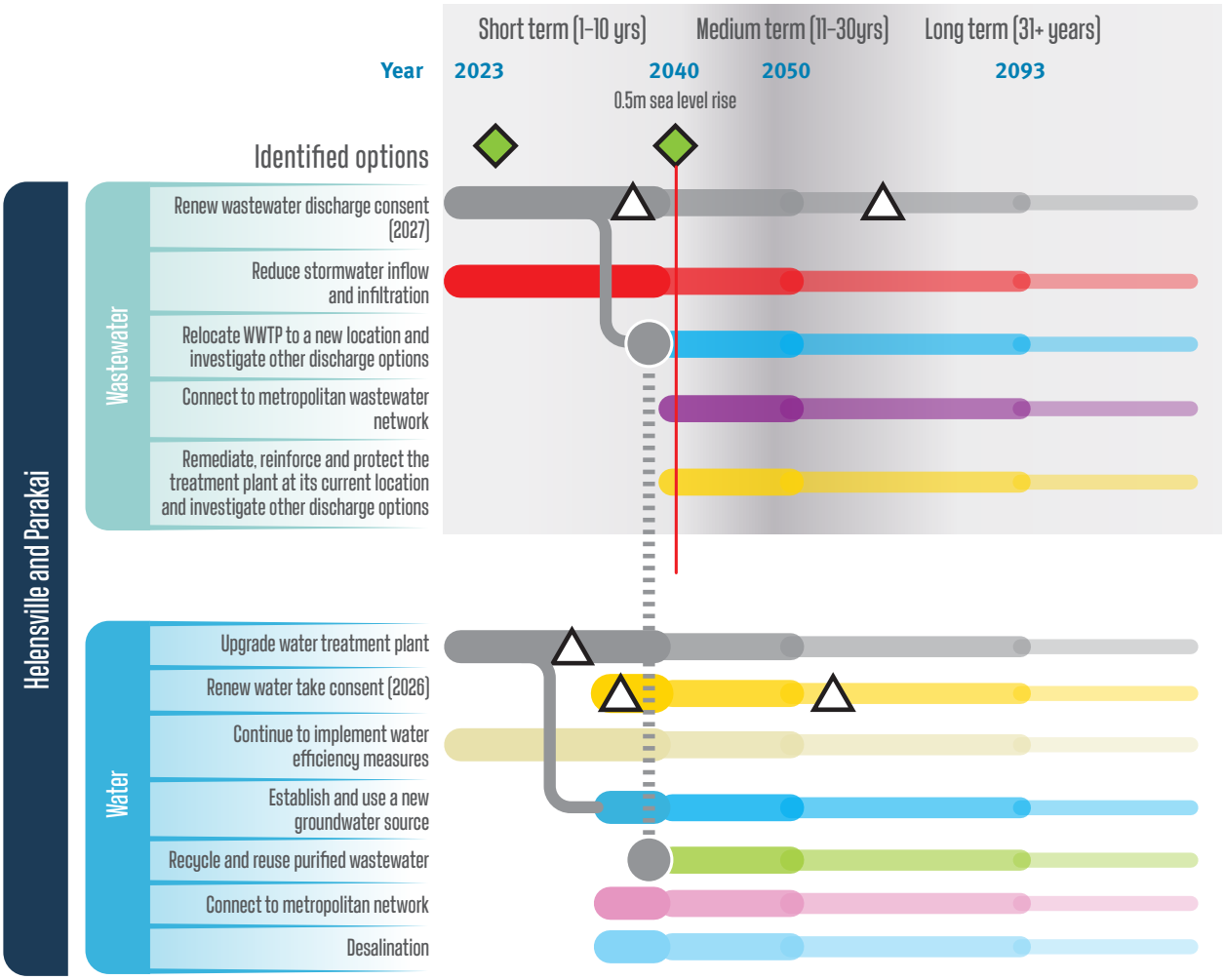
- Implement the next step of a pathway
- Shift to an alternative pathway
- Reassess the objectives of the plan itself.

Adaptive strategies need to be targeted and specific, with the chosen strategy and pathway taking into account the unique character and values of the servicing area. The development of adaptive strategies requires consideration of escalating risk, the values and associations of iwi/mana whenua, cooperation with other infrastructure providers, and the objectives of the local community.

Adaptive strategies are recommended across the short (0 to 10 years), medium (11 to 30 years) and long (31+ years) timeframes. However, it is important to note that the timing of when a change in strategy is required can be uncertain. Some specific signals and triggers are identified in this strategy. We have endeavoured to provide high-level indications of potential impacts that would lead to a change in strategy, and this would be when further formal engagement with the community is most likely.

Te rautaki urutau a Helensville me Parakai | Helensville and Parakai adaptive strategy

The following diagram contains a list of the water and wastewater options and their respective trigger points:



The adaptive plan above shows how the decision points can trigger the water and wastewater options for this area and vice versa.

* *Helensville and Parakai wastewater options can trigger water infrastructure considerations in the Helensville and Parakai areas.*

Figure 20 - Adaptive planning pathways for Helensville and Parakai

Ngā kōwhiringa ratonga wai | Water servicing options

We are currently in the process of upgrading our water treatment facility to meet the evolving needs of our community. In the short -term, we plan to renew our water take consent and continue to explore the most suitable location for a new groundwater bore to supplement the water supply and improve its resilience in the face of climate change impacts.

We are also committed to our Water Efficiency and continue to implement measures to maximise the utilisation of extracted and treated water, aligning with our dedication to environmental responsibility.

Looking ahead to the medium to long term, our approach involves close monitoring of the area's growth and development. Should population growth exceed our projections, we are prepared to explore additional water supply options. This proactive approach allows us to stay ahead of the demographic shifts and ensures a sustainable and reliable water supply to our community.

Ngā kōwhiringa ratonga waipara | Wastewater servicing options

In the short term we will renew the discharge consent. We need to start a conversation with the community about the future of the WWTP. In the medium term, we will be facing the potential impacts of climate change and will need to either abandon the existing plant or reinforce it to cope with the effects of sea-level rise and tidal inundation.

We have recently completed a comprehensive upgrade to our WWTP, significantly fortifying it against the challenges posed by wet-weather conditions. The upgraded plant has the capacity to accommodate the anticipated growth in population over the medium term. In the short term, we will need to start the process of renewing our wastewater discharge consent, while diligently monitoring the state of our ageing ponds and undertaking any remedial works needed to ensure safe and optimal functionality.

Looking ahead, we recognise the importance of engaging in a dialogue with the community to collectively decide on the future course of the WWTP. In the medium term, we are gearing up to address potential impacts of climate change, specifically considering the implications of rising sea levels and tidal inundation. This involves a crucial decision-making process as to whether to invest in reinforcing the existing wastewater infrastructure to withstand these environmental shifts or explore alternative solutions, such as abandoning and retreating to a different location.

Whakakapinga | Conclusion

We hope that this servicing strategy has clearly articulated the complex and important factors that will influence the future of the Helensville and Parakai area. These factors inform the timing and nature of what is developed and when, to ensure reliable, environmentally-aware and affordable water and wastewater services for decades to come. We aspire for these decisions to be made in partnership with mana whenua and through deep engagement with communities in the spirit of transparency and openness.

We have signalled in this strategy that there are a number of options around water supply scenarios for Helensville and Parakai. Independence from the metropolitan water network offers a certain type of resilience to these communities. The prospect of droughts and projected population growth in the area necessitate proactive consideration of water solutions that will give communities confidence that they will have access to the water they need. Currently we will continue the approach of private supply until there is a requirement to implement a public supply solution. This tipping-point trigger may include legislative requirements or an appropriate wastewater solution.

We have described the options for wastewater management, which in the short term will require a new consent, and upgrading the existing treatment plant and the alternative disposal options. In the longer term, it is likely that a mix of solutions will emerge as the water and wastewater needs of the new community members in developing areas are realised and the true impacts of climate change are felt in the area.

Whatever option we decide upon, the wastewater network requires responsible management from private properties to prevent clogs and reduce maintenance costs. Community cooperation in minimising rainwater and unwanted items in the system is crucial for efficient wastewater treatment, limiting untreated discharges into the environment. Balancing environmental protection with cost affordability requires the involvement of every resident in creating a sustainable wastewater management system for the current community and generations to come.

We want to reiterate our commitment to our objectives in writing this servicing strategy as identified at the outset: having purposeful conversations with our partners and the community which help us make wise investments at the right time, providing services for a healthy and growing population, adapting to and mitigating the impacts of climate change, and maintaining a focus on protecting the local environment. To even begin to achieve these aspirations, we need to set out our servicing strategy as a foundation for the conversations and decisions for which we need to make space.

Ngā mahi ka whai ake | Next steps

The Helensville and Parakai servicing strategy is a pilot initiative, to be developed and shared with the community. Its purpose is to enhance understanding of the complexities of the water and wastewater systems in Helensville and Parakai. We are committed to the best-practice development process, including mana whenua partnership and community engagement, as well as the creation of long-term adaptive strategies. The Helensville and Parakai servicing strategy is dynamic and subject to ongoing review by the infrastructure strategy and planning team, and mana whenua partners.

To sustainably manage this strategy, adaptive approaches will be integrated into relevant Asset Management Plans and decision-making. Implementing these strategies will involve continuous collaboration among Watercare departments to support iwi/tangata whenua as partners. Throughout the development of the servicing strategy, work programmes will be established as options to be selected, assessed and further refined. Each work programme or project will undergo a thorough assessment and business case evaluation.

Arotake o te rautaki whakarato | Review of servicing strategy

The Helensville and Parakai servicing strategy will be regularly reviewed if suggested by iwi, or required as a result of a specific trigger or signal which would necessitate adjustments. These reviews will consider new information related to hazards, climate change, asset data, and cultural and environmental factors. These reviews are the most likely opportunity for formal engagement with and feedback from the community.

In addition, the future review schedule will allow for addressing and incorporating any potential impacts resulting from changes to the Resource Management Act into the future plans and implementation of the servicing strategy.

Watercare

Watercare Services Limited
73 Remuera Road, Remuera,
Auckland 1050, New Zealand
Private Bag 92521, Victoria Street West,
Auckland 1142, New Zealand
Telephone +64 9 442 2222
www.watercare.co.nz

31 May 2024
Gregg Cunningham
Civix
99 Albert Street
Auckland CBD, 1010

Dear Gregg,

Re: Your request for an assessment of water and wastewater capacity
Address: 40 Mahi Road, Helensville
Watercare application number CON 223399

This assessment is independent of the Auckland Council consenting process. This letter does not constitute a pre-approval from Watercare.

In your consultation application you requested information from Watercare regarding the capacity in the water and wastewater systems to service a proposed plan change for **40 Mahi Road Helensville.**

The proposed plan change seeks to rezone the site from Rural - Countryside Living Zone and Future Urban Zone to Residential - Single House Zone. The total plan change area is stated to be 17.36 ha.

Future Development Strategy

The proposed plan change area comprises the entire Helensville (Stage 1) Future Urban Area, which is not anticipated under Auckland Council's Future Development Strategy 2023-2053 (FDS) to be urbanised before 2035+, and a portion of rural zoned land.

Appendix 6 of the FDS identifies the infrastructure prerequisites that enable the development of the Future Urban Areas. The Helensville Wastewater Treatment Plant (WWTP) and Helensville Water Treatment Plant (WTP) Upgrades are identified as infrastructure prerequisites necessary to support the development and growth of the Helensville Future Urban areas. These upgrades are planned to be delivered in line with the timing set out by the FDS of 2035+.

Watercare's bulk infrastructure programme is planned, funded and sequenced in accordance with the Auckland Council Development Strategy (previously the Future Urban Land Supply Strategy 2017 and more recently the FDS), the Auckland Council Growth Scenario (previously i11v6 and more recently AGSv1), and the Auckland Unitary Plan. Watercare considers that the proposed plan change is out of sequence with the FDS and, due to the inclusion of rural land, may not anticipated by the Unitary Plan or the AGSv1.

Watercare does not support out of sequence and/or unanticipated development that would impact Watercare's ability to deliver its planned infrastructure programme or result in reprioritisation or reallocation of funding in the 30 year Watercare AMP.

Water supply

There is very limited capacity in the existing Helensville WTP. The Helensville Future Urban Areas are not able to be serviced for water supply until the Water Treatment Plant upgrade is commissioned. Watercare is working towards delivering this upgrade in line with the timing of the FDS which is not before 2035+.

Wastewater

There is currently capacity at the existing Helensville WWTP; however, the existing WWTP discharge consent will expire in November 2027. A new discharge consent application will be lodged by May 2027 and will need to go through the statutory process. The future discharge parameters are not known and therefore there is no certainty that servicing growth out of sequence with the FDS is feasible.

To service the long term growth of Helensville, including the Future Urban Areas, Watercare is planning to deliver a new WWTP. The new WWTP will be delivered in line with the timing of the FDS which is not before 2035+.

Yours Sincerely

Nur Jahangir
Development Engineer

Watercare Services Limited
73 Remuera Road, Remuera,
Auckland 1050, New Zealand
Private Bag 92521, Victoria Street West,
Auckland 1142, New Zealand
Telephone +64 9 442 2222
www.watercare.co.nz

9 August 2024

Lance Hessell
Civix
99 Albert Street
Auckland CBD, 1010

Email: lance@civix.co.nz

Dear Lance,

Re: Your further request for an assessment of water and wastewater capacity
Address: 40 Mahi Road, Helensville
Watercare application number CON 223399

This assessment is independent of the Auckland Council consenting process. This letter does not constitute a pre-approval from Watercare.

In your consultation application you requested information from Watercare regarding the capacity in the water and wastewater systems to service a proposed plan change for **40 Mahi Road Helensville.**

Watercare provided a letter in response to the consultation application on 31/05/2024.

On 15 July 2024 via email, you requested clarification of the advice provided in the 31/05/2024 letter in relation to:

1. Confirmation of the capacity at the recently upgraded WWTP for the proposed development.
2. Whether assessments in terms of wastewater servicing need only relate to the wastewater network infrastructure.
3. Advice on aspects of the current wastewater infrastructure network as sought in the attached Civix assessment response memo – including details of the Rautawhiri Road pumpstation capacity and flows.
4. Clarification of the required scope of information for the plan change application, noting that more detailed information is usually required at the resource consent and Engineering Plan Approval stages.

Please find our response below with some additional comments provided in relation to water supply and the Future Development Strategy.

Confirmation of the capacity at the recently upgraded WWTP for the proposed development

Watercare have recently completed a comprehensive upgrade of the Helensville WWTP. The upgraded WWTP has capacity to accommodate the anticipated growth in population within Helensville over the next 30 years to 2054. The proposed plan change area comprises the entire Helensville (Stage 1) Future Urban Area, which is anticipated under Auckland Council's Future Development Strategy 2023-2053 (FDS) to be urbanised from 2035 onwards. The WWTP upgrade provides capacity in line with the Council's growth scenario to 2054 and therefore will have capacity to service the development of the Helensville (Stage 1) Future Urban Area. This presumes that the existing live zone and the Stage 1 and Stage 2 FUAs develop at a

density and rate anticipated by the Council's growth scenario. Where development does not align with the Council's growth scenario capacity at the WWTP may be taken up sooner than anticipated.

Water Supply

There is very limited capacity in the existing Helensville WTP. The Helensville Future Urban Areas are not able to be serviced for water supply until this capacity constraint is resolved which according to current forecasts is anticipated to be late 2026. However, there is some uncertainty for this timing given that an additional water source needs to be confirmed, and that the new timing of servicing the Helensville FUAs has been deferred to not before 2035+ which could result in the deferral of projects in Watercare's AMP to align with the FDS.

Whether assessments in terms of wastewater servicing need only relate to the discharge network infrastructure

Assessment to support the proposed plan change will need to consider the capacity of Watercare's bulk infrastructure. In Helensville Watercare's bulk infrastructure is limited to the WWTP and WTP. The capacity of these assets as at today's date is set out above.

Advice on aspects of the current wastewater infrastructure network as sought in the attached Civix assessment response memo – including details of the Rautawhiri Road pumpstation capacity and flows.

Watercare have reviewed the proposal to develop 135 lots within the plan change area and from a local wastewater network perspective there is sufficient capacity to service the proposed lots within the existing Rautawhiri wastewater pump station servicing catchment. This assessment is valid as of today's date and will need to be reassessed at the resource consent stage.

Water Supply

In terms of local water network capacity, a new 250PE (200mm ID) has been laid from the WTP through the reserve and east along Rautawhiri Road. This 250PE also extends into Mahi Road. The proposed development is on high elevated areas >35m with the HGL from the WTP reservoir only at 53m. Any development above the 35m contour will require boosting via a pump station, which will be the responsibility of the developer to deliver. With high elevations to the east which is a live zoned area the capacity of this booster pump station will need to consider the wider development catchment.

Clarification of the required scope of information for the plan change application.

The plan change application will need to consider the capacity of Watercare's bulk infrastructure to service the proposed development of the plan change area including how the rezoning of rural zoned land will impact the planned capacity of the bulk infrastructure and how the development proposes to provide potable water in advance of capacity becoming available in the WTP.

Assessment of the capacity of the local network is required at the time of Resource Consent.

Future Development Strategy

Watercare is required to align with Council in opposing private plan changes that are not in accordance with the FDS. Watercare considers that proposed plan change is out of sequence with the FDS and, due to the inclusion of rural land, is not anticipated by the Unitary Plan or the Council growth scenario.

Yours Sincerely

Amber Taylor

Development Planning Lead | Major Developments

Watercare Services Limited

Email: amber.taylor@water.co.nz

Mobile: 022 158 4426

Appendix B

HEALTHY WATERS EARLY ENGAGEMENT CORRESPONDENCE

Gregg Cunningham

From: Gemma Chuah <Gemma.Chuah@aucklandcouncil.govt.nz>
Sent: Wednesday, August 21, 2024 11:19 PM
To: Gregg Cunningham
Cc: Kugan Govender; Susan Andrews
Subject: RE: 40 Mahi Road, Helensville - Private Plan Change Application

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Gregg,
The private plan change application will need to be accompanied by a Stormwater Management Plan which meets the requirements of Healthy Waters NDC.
The NDC stormwater management requirements for greenfield developments can be found here:
https://www.aucklanddesignmanual.co.nz/media/pdwlas3n/healthy-waters-ndc-schedule-4-full-version.pdf
An SMP template can be found here:
https://www.aucklanddesignmanual.co.nz/media/h0xjzgrv/smp_template_explanatory.pdf

There is an SMP associated with the adjacent development which was prepared as part of the Special Housing Area applications for that site. Here is a copy of it:
Rautawhiri SHA - Stormwater Management Plan v1.1 w appendicies.pdf

That SMP did not allow for urban development of your site. The flood modelling assumed 0% impervious for those subcatchments. All stormwater management will therefore need to be provided within your site. Additionally, the small roadside raingarden approach taken in that SMP is no longer an acceptable approach due to operational and safety concerns with very small raingardens.

Water quality treatment and hydrology mitigation for all impervious areas including roads will be expected to be incorporated into your design (as required by the NDC) however communal scale devices would be a preferred option from Healthy Waters perspective if these are proposed to be vested.
The potential for stream erosion and how best to mitigate this will need to be considered.
Updated flood modelling will be required, including consideration of climate change.

An SMP associated with a Plan Change must contain enough detail to establish a feasible and functional best practicable option for managing all aspects of stormwater from the plan change area. Where exact details are not provided for example exact device design, approximate sizing and location should be included to ensure that enough space is allowed for any devices in the urban layout or anticipated yield. The SMP must clearly set out how and when that information will be provided in the future.

I don't have the as-built information for the existing network in the adjacent development, hopefully you managed to acquire that from the Development Engineer, if not I can go searching but this may take some time.

We are happy to work with you the develop the stormwater management approach and the SMP. If you wish to discuss the proposal in detail, please request a pre-application meeting through Plans and Places so that we can ensure that our advice is aligned with the other relevant council specialists and that time costs can be recovered.

Kind regards

Gemma

Gemma Chuah (she/her) | Mātanga Aporei | Principal – Resource Management
Te wāhanga mō ngā Wai Ora me te Manawaroa ā-Waipuke / Healthy Waters & Flood Resilience
Waea pūkoro / Phone 021 806 995
Te Kaunihera o Tāmaki Makaurau / Auckland Council
Te Wharau o Tāmaki Auckland House, 135 Albert Street, Auckland
aucklandcouncil.govt.nz

Please note Monday is not a working day for me.

From: Gregg Cunningham <gregg@civix.co.nz>
Sent: Wednesday, August 14, 2024 5:38 AM
To: HWDevelopment <HWDevelopment@aucklandcouncil.govt.nz>
Cc: Kugan Govender <kugan@civix.co.nz>
Subject: 40 Mahi Road, Helensville - Private Plan Change Application

To Whom it may concern,

We are looking to undertake design and planning for the subject site (40 Mahi Road, Helensville) of behalf of our client for a private plan change application.

We are proposing to replace the Future Urban Zoned land and some of the Countryside Living Zoned land with Single House Zone with a precinct applied to enable smaller lots between 250m2 to 450m2.

The remaining Countryside Living Zone areas will be predominantly where there are areas of significant bush and watercourses, or geotechnical constraints.

I would like to request information on the stormwater management requirements for the above site.

Has the wet detention pond (SW_GIS_ID - WRTF543730) been designed to cater for the upstream catchment including our development?

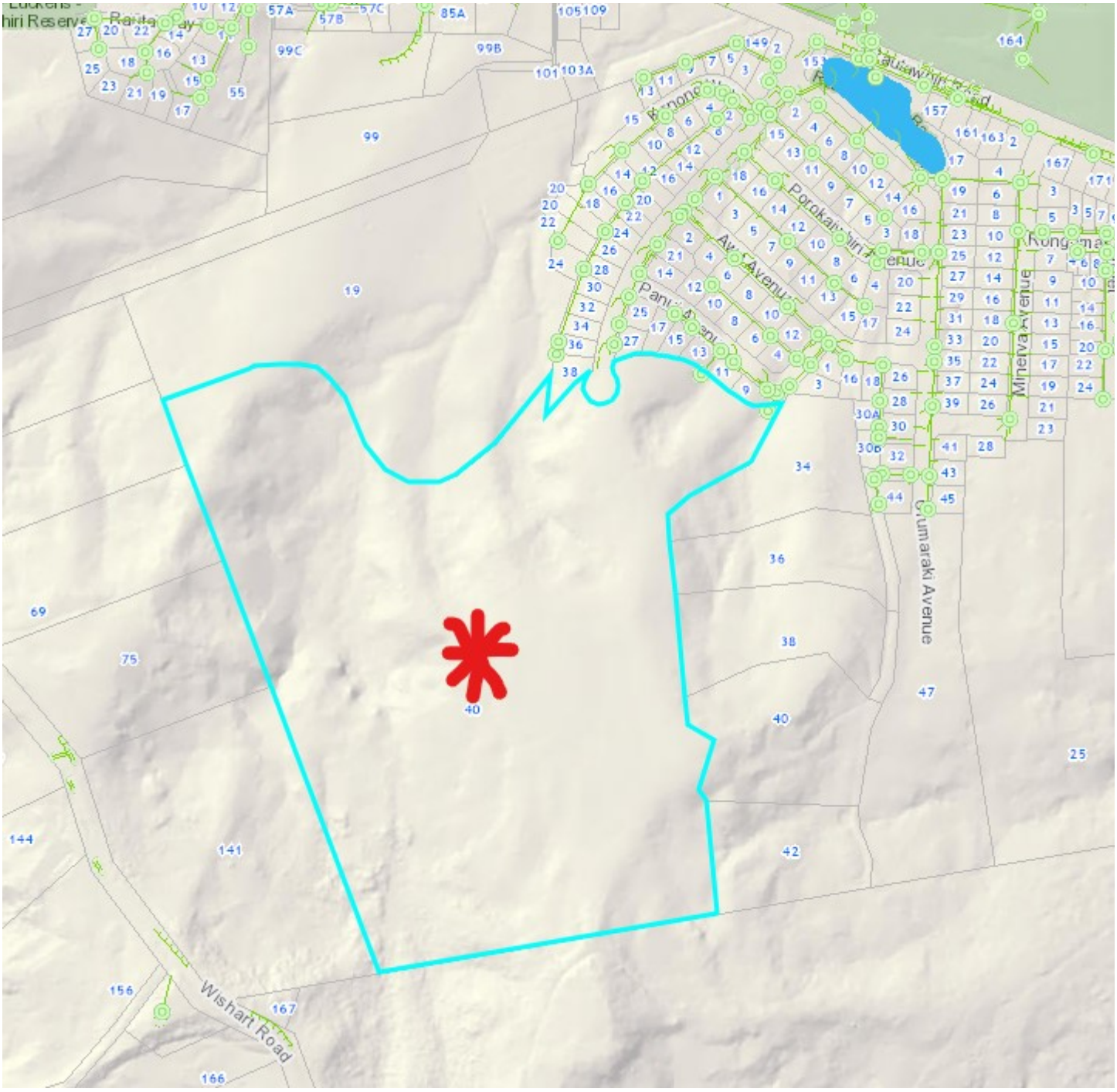
It appears raingardens have been used to treat runoff from the public roads within the development downstream of the subject site (Parkview Development).

Is treatment of the public road runoff required noting the expected traffic volumes are likely to be <5000 vehicles per day ?

It is noted that there have been two stormwater stubs (300 and 450mm Ø) laid into the subject site assumed to provide future connection for the proposed development. What catchments have been allowed as part of this approval ?

Please provide any further relevant information that will assist us in providing a stormwater strategy which aligns with healthy waters vision for the catchment.

Lastly, clarification is sought on the required scope of information required by healthy waters for the plan change application, noting that more detailed information is usually required at the resource consent and Engineering Plan Approval stages.



Please let me know should you have any queries on the above.

Your assistance is greatly appreciated.

Kind Regards

Gregg Cunningham (CPEng)
Team Leader Civil
M +64 22 460 0414 | **W** www.civix.co.nz
A Level 8, 99 Albert Street, Auckland, 1010
P PO Box 5204 Victoria Street West, Auckland, 1141
L Auckland | Christchurch | Tauranga

Appendix C

CHORUS LETTER OF CONFIRMATION

Chorus NZ Ltd
4 Graham Street
Auckland CBD
Auckland

Gregg Cunningham
CIVIX Limited
Level 8, 99 Albert Street
Auckland Central, Auckland, 1010

06/09/2024

Hi Gregg

Thank you for providing an indication of your development plans in the Helensville area. I can confirm that we have infrastructure in the general land area that you are proposing to develop at 40 Mahi Road, Helensville, Auckland. Chorus will be able to extend our network to provide connection availability. However, please note that this undertaking would of course be subject to Chorus understanding the final total property connections that we would be providing, roll-out of property releases/dates and what investment may or may not be required from yourselves and Chorus to deliver the infrastructure to and throughout the site in as seamless and practical way as possible.

The cost can only be finalised at the time that you are ready to proceed.

Chorus is happy to work with you on this project as the network infrastructure provider of choice. What this ultimately means is that the end customers (business and homeowners) will have their choice of any retail service providers to take their end use services from once we work with you to provide the physical infrastructure.

Please reapply with a detailed site plan once you are ready to proceed.

Kind Regards,

Merita Tagaloa
Group Account Manager
Chorus NZ Ltd

Appendix D

VECTOR SUPPLY AVAILABILITY LETTER

Vector Limited
101 Carlton Gore Rd
PO BOX 99882
Auckland 1149
New Zealand
+64 9 978 7788 / vector.co.nz

15 October 2024

Civix
Level 8, 99 Albert Street
Auckland, 1010

Attention: Kugan Govender

Supply Availability for

Further to your recent correspondence regarding availability of supply of electricity for your development of approximately 135 single phase 60 Amp residential connections at 40 Mahi Road, Helensville, at the time of this enquiry, Vector can confirm the following:

Electrical Reticulation

1.1 Vector Limited is the Electrical Operator of the distribution system which will provide Line Function Services to the individual Points of Supply within the development.

1.2 Vector has available capacity in the surrounding high voltage (HV) network.

1.3 Installation of new HV and low voltage (LV) cables, HV switches, transformers and equipment will be required to provide this development.

Please do not hesitate to contact me on 09 978 7833 if you have any further questions.

Regards

AJ Subramany

Customer Contracts Lead