



Wairaka Precinct Stormwater Management Plan



Wairaka Precinct: Stormwater Management Plan

Prepared for:

Ministry of Housing and Urban Development (HUD)

Prepared by:

mps limited

29 Chamberlain Street

Grey Lynn, Auckland 1021

<i>Originator:</i>	Phil Jaggard
<i>Client Contact</i>	Hannah Mcgregor
<i>Status</i>	Final
<i>Date</i>	May 2021

COPYRIGHT: The information contained in this document prepared by mps limited is solely for the use of the client identified on this sheet and for the purpose for which the document was prepared. mps limited does not accept any responsibility for any other use of this information or any third party that may rely on information in this document. No part of this document can be copied in any form without the written permission of mps limited.

CONTENTS

1. EXECUTIVE SUMMARY.....	1
1.1 Overview.....	1
2. INTRODUCTION.....	3
2.1 Background.....	3
2.2 Overview.....	3
2.3 Purpose of this Report.....	3
2.4 Scope.....	3
2.5 Desired Outcomes	4
2.6 Assumptions	4
3. EXISTING SITE	5
3.1 Precinct Description	5
3.2 Existing Land Use	7
3.3 Natural and Physical Characteristics.....	8
3.3.1 Stormwater Catchment and Topography.....	8
3.3.2 Wairaka Stream and Ecology.....	10
3.3.3 Receiving Environment	10
3.3.4 Soils and Geotechnical Conditions.....	10
3.3.5 Contaminated Land and Significant Contaminant Sources.....	12
3.3.6 Heritage Features	12
4. EXISTING STORMWATER SYSTEM	12
4.1.1 Existing Drainage Network	12
5. AUCKLAND UNITARY PLAN AND STORMWATER REQUIREMENTS	15
5.1 Auckland Unitary Plan (Operative in part).....	16
5.1.1 Auckland-wide provisions.....	16
5.1.2 AUP Precinct.....	17
5.1.3 Significant Vegetation.....	19
5.2 Network Discharge Consents.....	21
5.3 Existing Oakley Stormwater Management Plan.....	21
6. CONSULTATION AND ENGAGEMENT	23
7. PROPOSED DEVELOPMENT PROPOSAL.....	25
8. STORMWATER MANAGEMENT APPROACH	28
8.1 Water Sensitive Design Guidelines and Principles Adopted.....	28
8.2 Stormwater Conveyance.....	28
8.3 Flooding and Overland Flow Path Management.....	31
8.4 Hydrology mitigation.....	32

Wairaka Precinct: Stormwater Management Plan

8.5	Water Quality	34
8.6	Summary Stormwater Management Approach.....	35
9.	SMP IMPLEMENTATION.....	36
9.1	Staging/Timing	36
9.2	Ongoing Ownership Maintenance and Management Responsibilities	36
10.	CONCLUSION.....	37
	APPENDIX 1: A3 PLANS	38
	APPENDIX 2: AUCKLAND UNITARY PLAN MAPS.....	39
	APPENDIX 3: SMP CHECKLIST	40

1. EXECUTIVE SUMMARY

1.1 Overview

The Wairaka Precinct Stormwater Management Plan has been prepared for the Ministry of Housing and Urban Development (HUD) and the Waitemata District Health Board (WDHB) taking into consideration the current site conditions and information on the development plans from landowners within the Precinct.

The Wairaka Precinct is subject to a new set of land use provisions in the Auckland Unitary Plan, allowing business and residential development. The Precinct is affected by flooding and overland flow paths and is predominately serviced by private stormwater infrastructure including an existing private stormwater wetland that receives flows from the upstream public network. The Wairaka Stream divides the site before eventually discharging spring waters and stormwater to Te Auaunga/ Oakley Creek, which is located on the western boundary.

This Stormwater Management Plan (SMP) provides the information to support the minimum stormwater requirements for the redevelopment of the Wairaka Precinct. The plan builds off the current infrastructure that is present to provide certainty on the stormwater network servicing for the Precinct. The proposed stormwater management approach assists in the protection and enhancement of the natural characteristics that currently exist on site.

The recommended methods of stormwater management within this report have been considered at the Precinct catchment level and is reliant on landowners undertaking detailed site investigations during the redevelopment to confirm the stormwater management suitability at a site level. The SMP takes into consideration the principles of Water Sensitive Design (WSD) and how these can be used to mitigate potential negative impacts from stormwater on the receiving environment.

The stormwater management approach has been determined through an assessment using available information and knowledge of the stormwater catchment, development scenarios and constraints. This included a review of previous asset investigations along with site visits and the review of related documents such as the Oakley Creek Stormwater Management Plan (Beca Carter Hollings & Ferner Ltd, 1998). A Wairaka Precinct Stormwater Model has been developed and updates the findings of the previous investigations. It has been used to identify key issues and is the primary supporting document for this SMP.

The following key issues were identified and have the potential to impact on the way stormwater is managed and dealt with within the Wairaka Precinct:

- Increase in runoff, flow velocity, contaminants, and heat, resulting from an intensification of development.
- The Te Auaunga/ Oakley Creek Stream receiving environment is a Significant Ecological Area (SEA).
- The potential for stream erosion and loss of vegetation if the increased runoff from development is not controlled to the stream environment.
- Flood risk areas and overland flow paths as identified by the Wairaka Precinct Stormwater Model.
- Effect of increase in impervious surfaces on water quality and the physical shape and form of the receiving waters.
- An Aquifer protection zone and how it will be protected.
- Fragmented ownership.
- Existing development and buildings.

A review of relevant stormwater guidelines and policies was carried out to determine the appropriate stormwater and flooding requirements to adopt in the SMP. This included a review of the AUP policies and rules, both city-wide and for the respective precinct and the recently granted Healthy Waters Region Wide Stormwater Network Discharge Consent.

The following stormwater management options and outcomes are considered to be appropriate for the Wairaka Precinct:

- The creation of developable land for mixed and residential land use to support brownfield intensification in Auckland through stormwater network upgrades, diversions, and extensions to convey the 10 and 100-year ARI flows.
- An integrated stormwater management approach that mitigates the impact of existing and future land use.
- Enhancement of the Wairaka stream, including daylighting the lower sections where practical.
- Use of low-contaminate generating roofing material.
- Treatment for existing main road corridors and carparks that do not discharge to an existing treatment device.
- Removal of large car parking areas with no treatment devices.
- Support retention of the water quality treatment and detention in the Central Wetland.
- Upgrade the stormwater pipe network and overland flow paths to convey flows to Te Auaunga/ Oakley Creek.
- Installation of super/mega catchpits at key locations to intercept overland flow paths and flood waters.
- Oversized outfall pipes where appropriate to manage flood flows that cannot be managed safely with other methods. A flood risk assessment and analysis will be undertaken as part of any specific development proposal.
- Preference for overland flow paths to be concentrated in road corridors.

The recommended stormwater management approach is the Best Practical Option and is in line with Auckland Council standards, the Healthy Waters Network Discharge Consent and the provisions set out by the Auckland Unitary Plan (AUP).

2. INTRODUCTION

2.1 Background

The Wairaka Precinct is subject to a new set of land use provisions in the Auckland Unitary Plan (AUP), allowing intensive business and residential development. The purpose of the Wairaka Precinct is to provide for a diverse urban community, including the ongoing development and operation of the tertiary education facility, the development and operation of a range of community, recreation, and social activities, the development of a compact residential community, and commercial service activities. In addition, it allows for the healthcare/hospital services associated with the Mason Clinic and provides for light manufacturing and servicing associated with the Taylor's laundry services.

Existing landowners within the Precinct are now progressing plans to redevelop their respective sites in line with the proposed new set of land use provisions (the 'Wairaka Precinct') in the AUP. The Wairaka Precinct rules require that all subdivision and development of the land in the precinct must be consistent with the approved Stormwater Management Plan (SMP).

2.2 Overview

This SMP establishes the current scenario of the existing stormwater infrastructure, along with the site conditions, and measures the potential impacts of the redevelopment on the current scenario. The resulting management strategy was assessed against AUP requirements, Healthy Waters Regionwide Stormwater Network Discharge Consent (NDC) requirements, and water sensitive design, as well as the urban design criteria, promoting the protection of the receiving and natural environment.

2.3 Purpose of this Report

The overall purpose of the SMP is to provide guidance to landowners and developers on how stormwater from Wairaka Precinct and the upstream contributing southern catchment, which includes the public network, will be managed considering the potential development proposed. This guidance shall be consistent with Auckland Council policies, plans and resource consents. Non-statutory policy and planning documents are also considered.

The purpose of the Wairaka SMP is as follows:

- Provide a Stormwater Management Plan to satisfy the Wairaka Precinct rules.
- Set minimum stormwater requirements for the redevelopment to mitigate potential negative impacts, including on sensitive environments.
- Identifies key problem areas, issues and constraints that impact the chosen stormwater management approach.
- Provide a high-level options assessment to determine a preferred method of stormwater management to meet requirements along with protecting and promoting the natural values within the catchment.
- Considers a holistic approach to stormwater management, considering hydrology and the hydraulic processes and constraints of a brownfield redevelopment.
- Provides a solid basis of information that can be used for future detailed design and investigation.

2.4 Scope

The scope of the Wairaka SMP is set out below:

- The identification and review of available data and assets.
- Review of the existing site conditions along with the redevelopment plans.
- Provide a high-level catchment assessment of potential impacts of development on the receiving environment.
- Review and use of the Wairaka Precinct Stormwater Model results.
- Identify opportunities and issues that are present on site to develop an overall management strategy.

2.5 Desired Outcomes

The outcomes to be achieved by the Wairaka SMP are:

- The creation of developable land for mixed and residential uses to support brownfields intensification in Auckland.
- An integrated stormwater management approach that mitigates the impact of existing and future land use.
- Protection against any stream or spring loss from the redevelopment, in particular the Wairaka Stream is to be daylighted in its lower sections where practical.
- Protection of the receiving environment.
- Protection of people and property from flooding, including the vulnerable within the Mason Clinic.
- Where appropriate and practical, stormwater runoff overland shall be conveyed within road corridors to maximise development land and minimise risk to existing and proposed buildings.

2.6 Assumptions

The following assumptions have been used in preparing this Stormwater Management Plan for the Wairaka Precinct site:

- Existing and future pipe capacity is based on high level results from the Wairaka Precinct Stormwater Model which was created from asset data from variety of sources and updated in 2021 by WSP Global consultants.
- Stormwater flows were calculated using TP108 and includes an allowance for climate change as per Auckland Council's requirements.
- The maximum impervious surfaces will be in general accordance with those set out in Figure 7.1 of this report.
- Topography is based on the 2016 Lidar information.
- The existing Central Wetland continues to have treatment capacity for the upstream catchment.
- Stormwater treatment of runoff at each gate entrances to the Precinct will be provided for.

There are limits to the assumptions, and in particular:

- Due to uncertainty over the timing and staging of the development, careful management will be required to ensure that as the development proceeds, OLFP and flood risks of existing buildings is not increased. It is proposed that the Wairaka Precinct Stormwater Model developed is used to assess changes in overland flow paths and flooding as part of resource consent applications.
- Provision for stormwater runoff associated with any Carrington Road widening is not currently provided for within this SMP. Solutions for this stormwater runoff will need to be identified and resolved at the time the Carrington Road widening works are designed.
- Note all stormwater solutions reflect the Healthy Waters Network Discharge requirements that no stormwater upgrades will be located on third party land without the agreement of those landowners.

Table 1 SMP Summary Table

APPLICANT:	Ministry of Housing and Urban Development (HUD)
AFFECTED LANDOWNERS WHO HAVE AGREED TO THIS SMP	Whai Rawa Property Holdings LP (Ngāti Whātua Ōrākei), Whai Rawa Development LP (Ngāti Whātua Ōrākei) and Waitemata District Health Board
APPLICANT'S AGENT:	MPS Limited
SITE ADDRESS:	Wairaka Precinct
SITE AREA (HA):	64.5 hectares
NATURE OF LAND USES/ DEVELOPMENT:	Core education centre, business, residential, open space, health and laundry services.
AUCKLAND UNITARY PLAN ZONE:	Business - Mixed use Zone Special Purpose Zone Residential - Terrace Housing and Apartment Buildings Zone
AUCKLAND UNITARY PLAN PRECINCT (IF APPLICABLE):	Wairaka Precinct I334
SMAF AREA (IF APPLICABLE):	N/A
NETWORK DISCHARGE CONSENT (IF APPLICABLE):	Council's Oakley Network Discharge Consent (Consent Number 24973) Exiting Private Stormwater Discharge Consents Auckland Council Regionwide NDC
OVERARCHING CATCHMENT NAME AND CATCHMENT AREA: (REFER TO AUCKLAND COUNCIL GIS CATCHMENT LAYER)	Te Auaunga/ Oakley Creek
TYPE OF RECEIVING ENVIRONMENT: (E.G. STREAM, PIPE, COAST, LAND, WETLAND, ETC.)	Stream – Te Auaunga/ Oakley Creek

3. EXISTING SITE

3.1 Precinct Description

The Wairaka Precinct (refer to Figure 3.1) is located in Auckland, between Point Chevalier and Mount Albert – 6km south-west of the CBD – on Carrington Road. Of the total 64.5ha precinct area, 26.5 hectares is held by Her Majesty the Queen through HUD for residential development, 6.8 hectares by the Waitemata District Health Board (Mason Clinic), 2.5 hectares by Norak Properties Limited (Taylors Laundry Services), 4.4 hectares by Whai Rawa Property Holdings and Whai Rawa Development LP (Ngāti Whātua Ōrākei) and Unitec New Zealand Limited (Unitec), whose current operation covers 24.13 hectares of the site, but is more heavily concentrated in the southern and mid portion of the site.



Figure 3.1 Existing Site and Surrounds

3.2 Existing Land Use

The existing Wairaka Precinct is divided into the existing development land lots as shown in Figure 3.2 on the next page and their respective land use is summarised in Table 2 on page 8. Note that Figure 3.2 shows only initial development plans for land owned by the Crown. Plans for other land holdings are still under development.

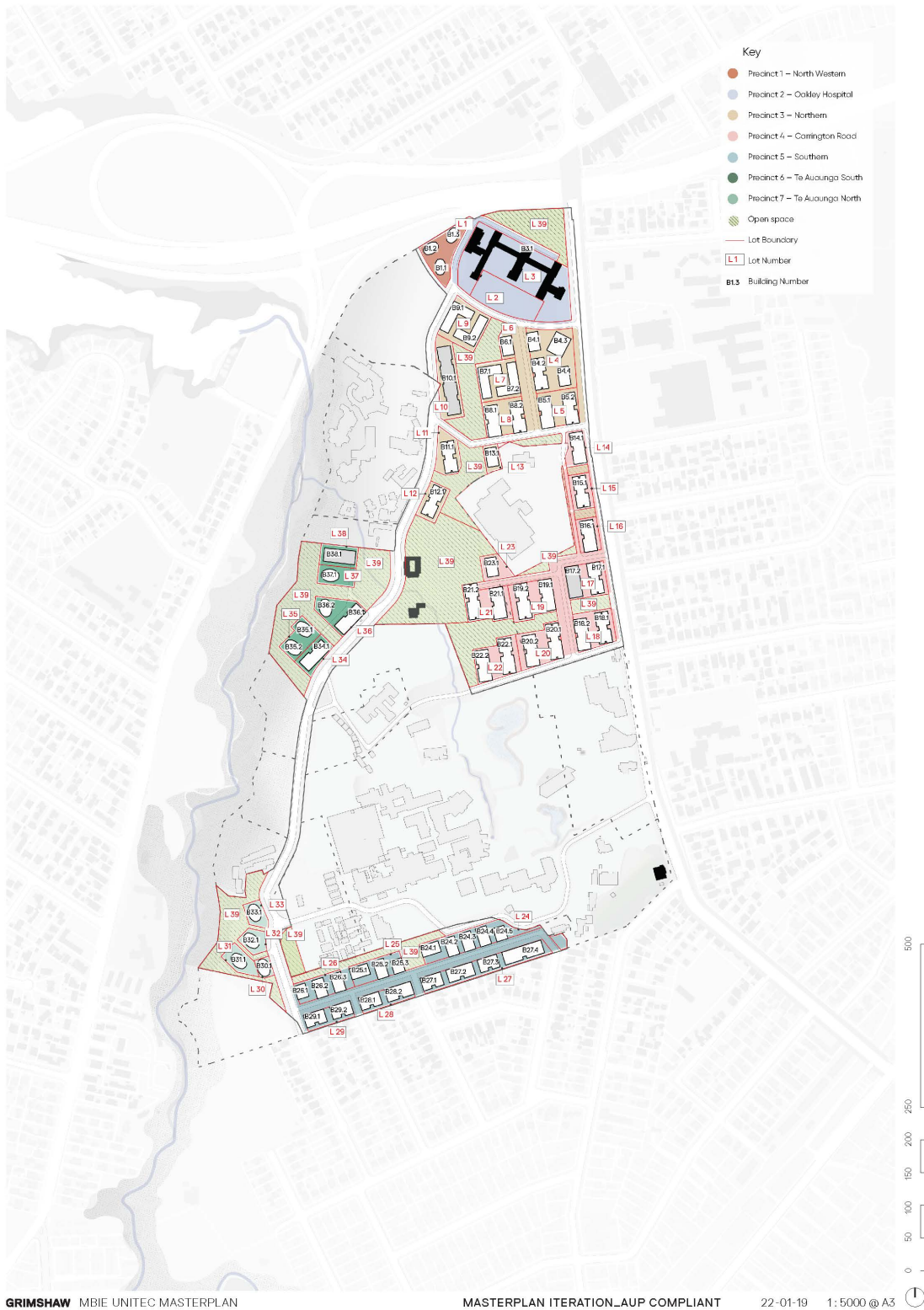


Figure 3.2 Proposed Development

Table 2 Wairaka Precinct - Development Lots and Land Use

Development Lot	Existing Land Use
Precinct 1 (North Western)	Few minor buildings.
Precinct 2 (Carrington Hospital)	Historic building, former Unitec education facilities.
Precinct 3 (Northern)	Unitec education facilities (leased).
Precinct 4 (Carrington Road)	Sports field, Air Cadets, veterinary clinic and emergency hospital, ropes course, and a few minor buildings.
Precinct 5 (Southern)	Predominately car parking. Former Unitec education facilities and buildings have been demolished.
Precinct 6 (Te Auaunga South)	Student houses and education facilities.
Precinct 7 (Te Auaunga North)	Undeveloped land, gardens and large open grass area, a few buildings.
Taylor's Laundry	Laundry facility - Privately owned business.
Mason Clinic – Waitemata District Health Board	District Health Board Regional Facility – provides integrated forensic mental health services to the northern region's courts, prisons and general / outpatient mental health services.
Whai Rawa Development LP	Predominately undeveloped land with some student accommodation.
Unitec	Unitec education facilities, gym, multi-storey office building.

3.3 Natural and Physical Characteristics

3.3.1 Stormwater Catchment and Topography

Figure 3.3 shows the entire stormwater catchment which includes the Wairaka Precinct and the upstream southern residential area. The Wairaka Precinct is bounded by Te Auaunga/ Oakley Creek to the west, Carrington Road to the east, the North-western motorway to north and low-rise residential development to the south. Due to the topography, the Wairaka Precinct and upstream southern stormwater catchment drains to Te Auaunga/ Oakley Creek, with the Creek flowing through a deeply incised gully along the western boundary, under the North-western Motorway and out into the Waitemata Harbour.

The Wairaka Precinct is located significantly above (15 to 20 meters) Te Auaunga/ Oakley Creek with a steep slope of approximately 32 degrees from the western boundary to the Creek centreline. Elevations of the site range approximately from 10 metres to 80 metres above sea level. The natural westwards slope of the site and topography to Te Auaunga/ Oakley Creek means that the Precinct is not impacted by stormwater flows from Te Auaunga/ Oakley Creek. Therefore, overland flow paths and stormwater can discharge to the Creek without any backwater effect.

Carrington Road runs parallel to the site on the east side and due to the kerb and natural rises at each entrance there is little to no run-off from the road entering the site. Stormwater entering catchpits on Carrington Road discharges to a number of discrete stormwater networks consisting of soak holes, connections to the public wastewater network or the public stormwater network heading in an easterly direction away from the Wairaka Precinct (i.e. towards Meola Creek).

The surrounding residential area to the south predominately discharges to soakage except for the presence of a small localised public stormwater pipe network as shown in Figure 3.3. This network

enters the Wairaka Precinct via a 900 mm pipe from Mark Road which flows into the central pond and wetland on Unitec's land (Central Wetland). A spring fed stream (Wairaka Stream) runs through the Wairaka Precinct prior to discharging into Te Auaunga/ Oakley Creek. The Central Wetland discharges to the Stream part way down its length. In addition, a detention wetland (Trades Wetland) is located to the west and receives flows from the Unitec's Trades building. The Central and Trades Wetlands are owned and operated by Unitec and are covered by separate discharge consents as follows:

- Central Wetland - Discharge Permit 928246
- Trades Wetland - R/LUC/2014/3486

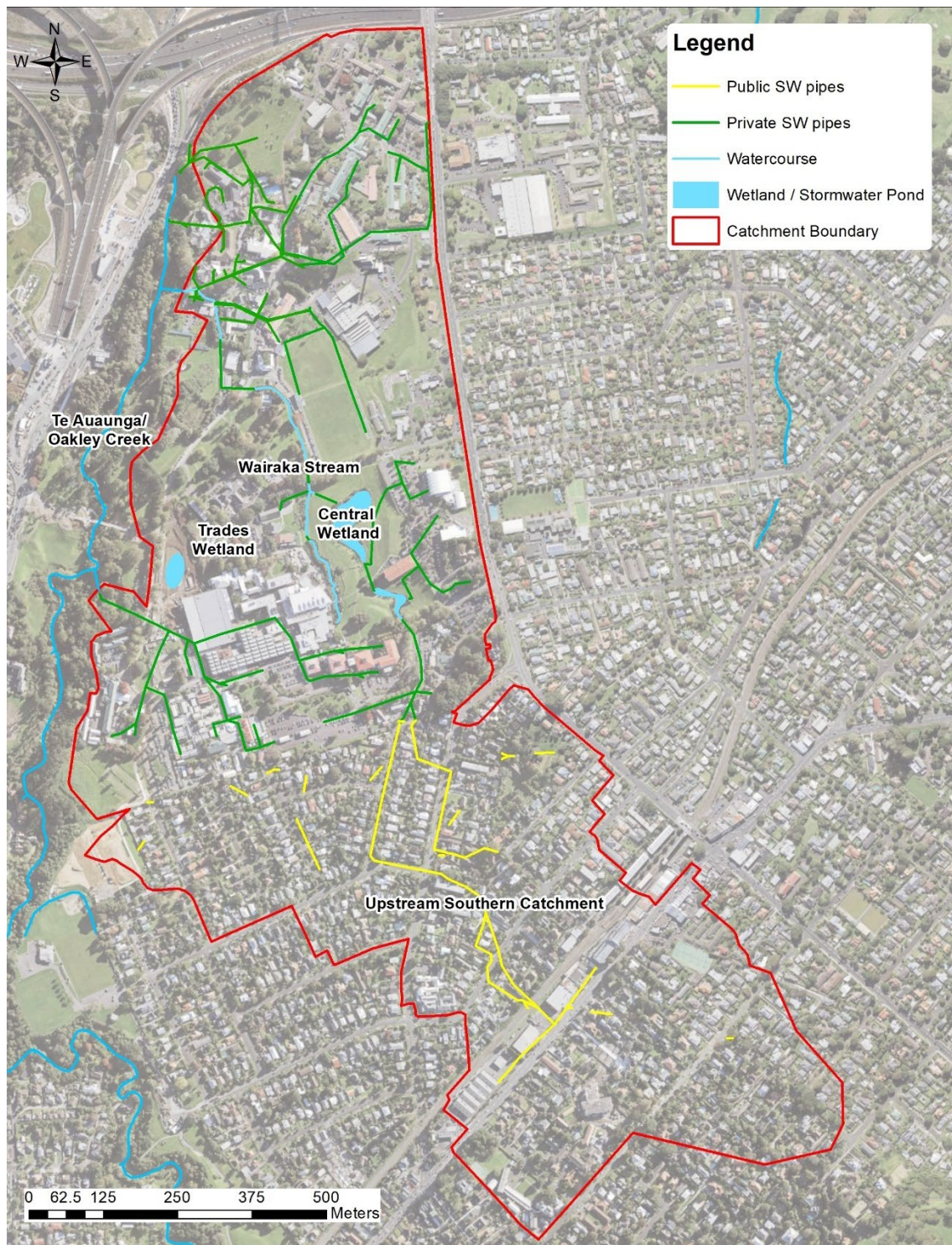


Figure 3.3 Stormwater Catchment Boundary

3.3.2 Wairaka Stream and Ecology

The Wairaka Stream is a tributary of Te Auaunga/ Oakley Creek and is the primary freshwater feature located within the campus grounds. The stream is fed by an underground spring originating from the Mt Albert basalt aquifer and base flows are supplemented by treated stormwater runoff from the site and the surrounding catchment. Numerous freshwater fish have been recorded along the length of the Wairaka Stream, including bullies, populations of adult inanga, galaxiids and eels. The Wairaka Stream is important to Iwi, Unitec, and the wider community for a number of reasons, including the cultural significance of the Puna (spring), the support it provides for cultural activities associated with Unitec's marae (Te Noho Kotahitanga) and the ecological integrity of the spring within an urbanised environment.

3.3.3 Receiving Environment

Stormwater runoff from the Wairaka Precinct and the southern catchment ultimately discharges into Te Auaunga/ Oakley Creek with the remainder discharging to the underlying aquifer. Te Auaunga/ Oakley Creek also receives stormwater runoff from the larger upstream Te Auaunga/ Oakley Stormwater Catchment. The reach that passes alongside the Wairaka Precinct is less modified than the upper reaches and scores high in both habitat and amenity measures. There are public pathways along with a 6-metre-high waterfall that acts as a fish barrier to the upper reaches of the Creek. As it leaves the northern boundary of the Wairaka Precinct, Te Auaunga / Oakley Creek passes under the North-western Motorway and into the Waitemata Harbour (proximate to the Motu Manawa Marine Reserve).

Te Auaunga/ Oakley Creek is classified as a Significant Ecological Area – Terrestrial, due to the area being home to indigenous vegetation and significant habitats of indigenous fauna. The immediate coastal area where it discharges is classified as a Significant Ecological Area – Marine 1 under the AUP as it is an indigenous wading bird area and provides a migration path between marine and freshwater habitats for a number of native freshwater fishes.

The Wairaka Stream is highly modified. Although the stream modification does not include concrete bottom lined channels, the stream passes through multiple culverts, is covered by concrete capping in the middle reaches, and appears to have been realigned in the lower sections.

The majority of the Wairaka Precinct is located in a Quality Sensitive Aquifer Management Area as defined under the Unitary Plan. In the southern part of the Precinct the existing groundwater levels are near the surface and display seasonal fluctuations in flow. Water levels just below the surface were observed during the excavation associated with the construction of the Unitec Trades Building. In addition, a seasonal natural spring is located at the South-western corner of the site near the recently completed cycle way path entering from Laurel Street.

3.3.4 Soils and Geotechnical Conditions

Three geological formations are found within the Wairaka Precinct. The majority of the site comprises of Basalt and Basanite Lava with East Coast Bays formation and Puketoka Formation covering the remainder of the site. A map of the soil types is shown in Figure 3.4.

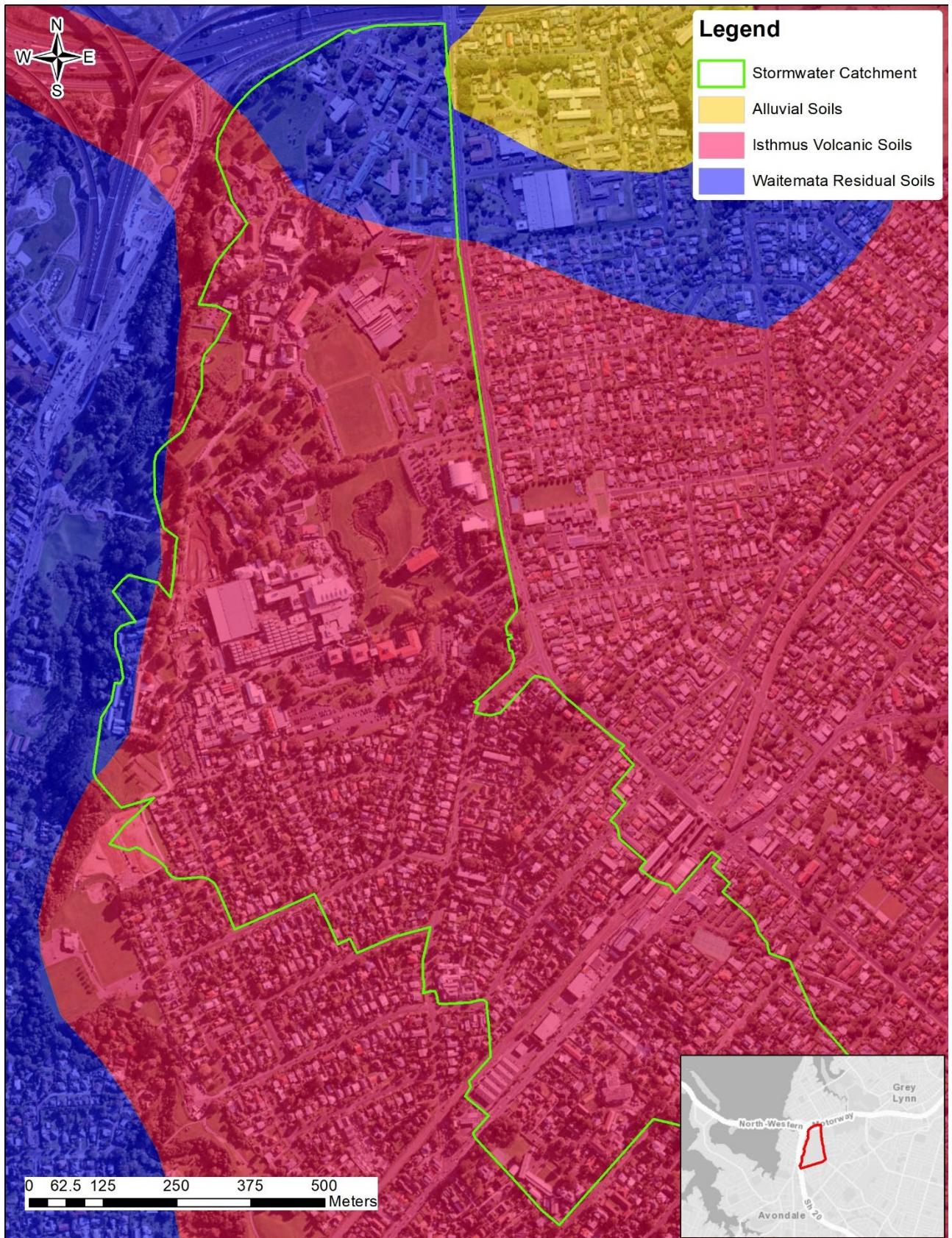


Figure 3.4 Soil Types

3.3.5 Contaminated Land and Significant Contaminant Sources

Due diligence completed between 2017 and 2018 and acquired by HUD refers to the potential for HAIL activities/industries, with a small sample set suggesting concentrations of some contaminants of concern in some areas. The identification of contaminants of concern will be based on the Hazardous Industries and Activities List (HAIL) which have the potential to affect soil or groundwater. Any hazardous contaminants will be identified through individual studies to be undertaken by landowners in preparation for consents and development and dealt with appropriately during the construction phase of the redevelopment.

3.3.6 Heritage Features

Heritage features were identified using the AUP overlay. In the North East of the site is a Historic Heritage Overlay Extent of Place associated with the former Oakley Hospital Building. This building is expected to be predominately retained through the development.

4. EXISTING STORMWATER SYSTEM

The existing stormwater system and existing flooding (extent and depth) are shown in Figure 4.1 and 4.2 respectively.

4.1.1 Existing Drainage Network

It is estimated that 43% of the Wairaka Precinct is currently impervious. The Wairaka Precinct is serviced by both a public and private stormwater system that predominantly drains to Te Auaunga/ Oakley Creek. The public infrastructure is located in the south-eastern corner of the site, entering from Mark Road before discharging to the existing Central Wetland. This network services the upstream catchment along with a small area of the precinct. A map of the existing drainage network is shown in Figure 3.7.

The rest of the site is serviced by a private gravity stormwater network consisting of catchpits, manholes, pipes, streams and natural springs, wetlands and a small pond. This private network system discharges via various outfalls into Te Auaunga/ Oakley Creek which runs along the western side of the site. The Wairaka Stream passes through the site before discharging to Te Auaunga/ Oakley Creek. Any stormwater runoff that does not discharge into Te Auaunga/ Oakley Creek is collected by the stormwater catchpits servicing Carrington Road that runs parallel along the eastern boundary.

The networks most common pipe size is 225mm in diameter with pipe sizes ranging from 225mm to 900mm in diameter. The stormwater network was surveyed in 2002 by Harrison Grierson in Mt Eden 1949 coordinate system. For mapping and stormwater modelling purposes these coordinates have been converted to NZTM2000 through the LINZ website. Part of the network was upgraded and replaced as part of the construction of the new Trades Building within the Core Education area, including construction of the Trades Wetland to manage peak flows on the existing piped network.

Though there is extensive basalt covering the site that would allow for disposal of stormwater to the aquifer below to occur, there are no known soak holes located within the site.

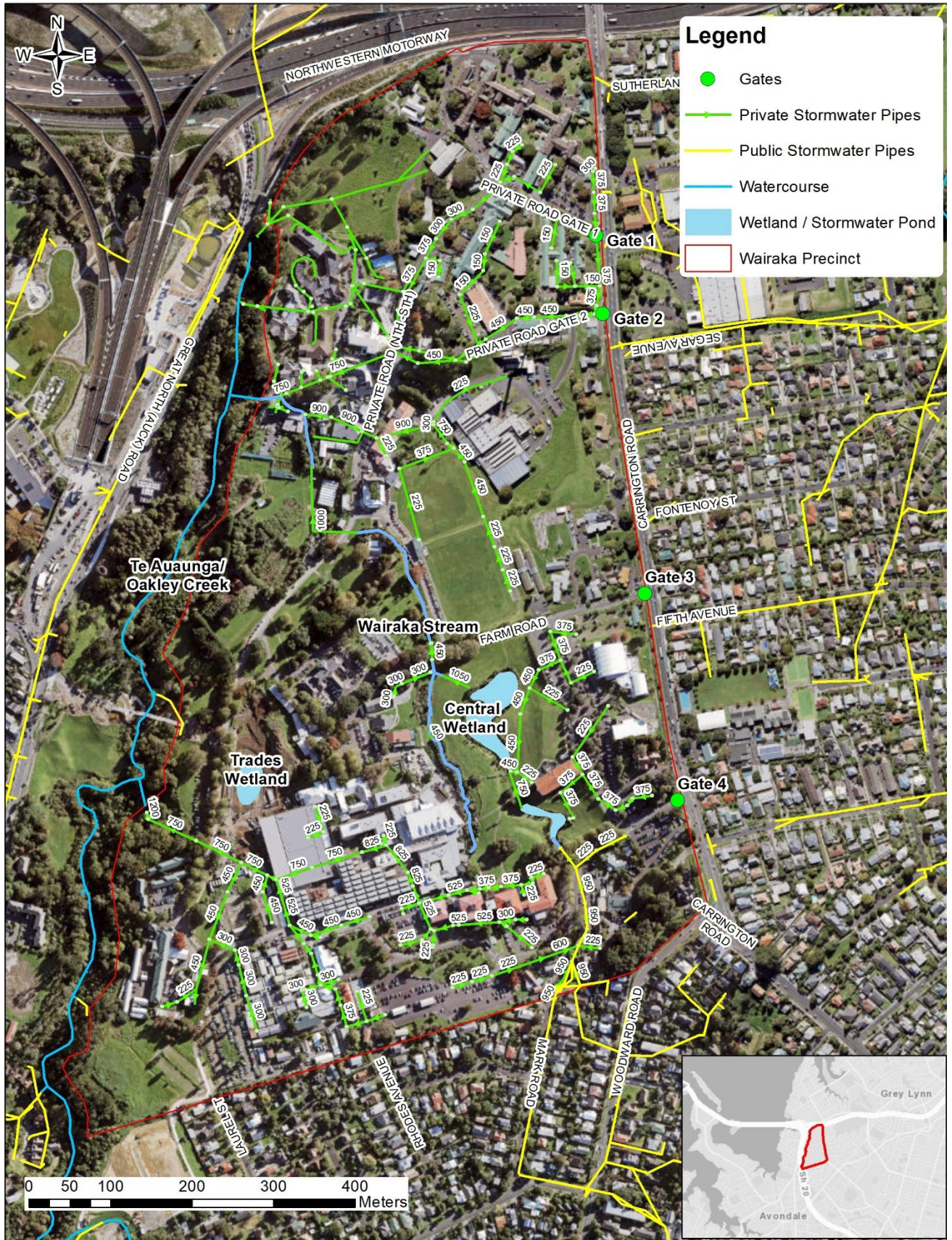


Figure 4.1 Existing Stormwater System

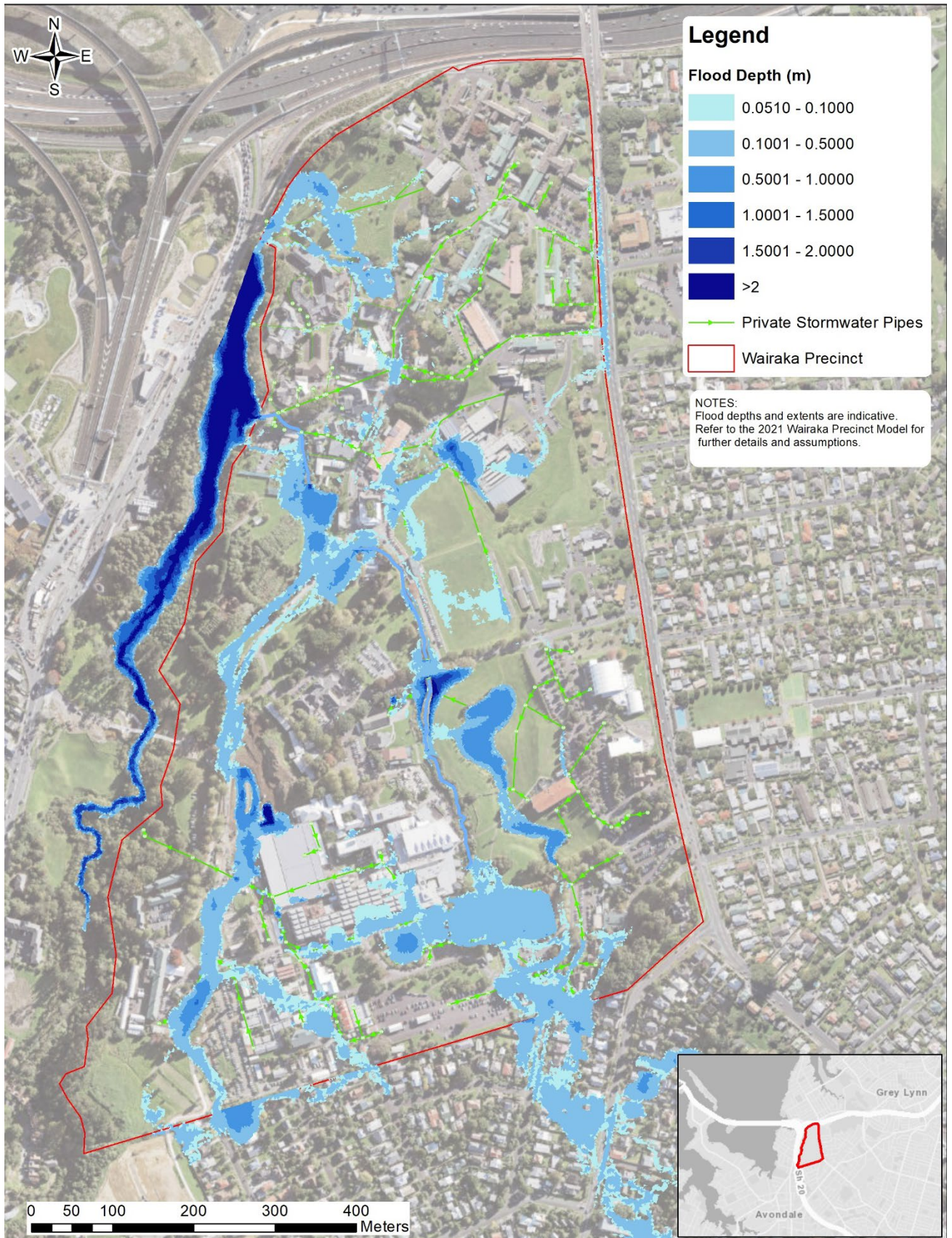


Figure 4.2 Existing Flooding – Wairaka Precinct Stormwater Model 2021

5. AUCKLAND UNITARY PLAN AND STORMWATER REQUIREMENTS

The Wairaka Precinct site has four different zones under the AUP as shown in Figure 5.1:

- Special purpose zone (grey).
- Business – mixed use zone (violet).
- Residential – terrace housing and apartment buildings zone (dark orange).
- Residential – mixed housing urban zone (light orange).

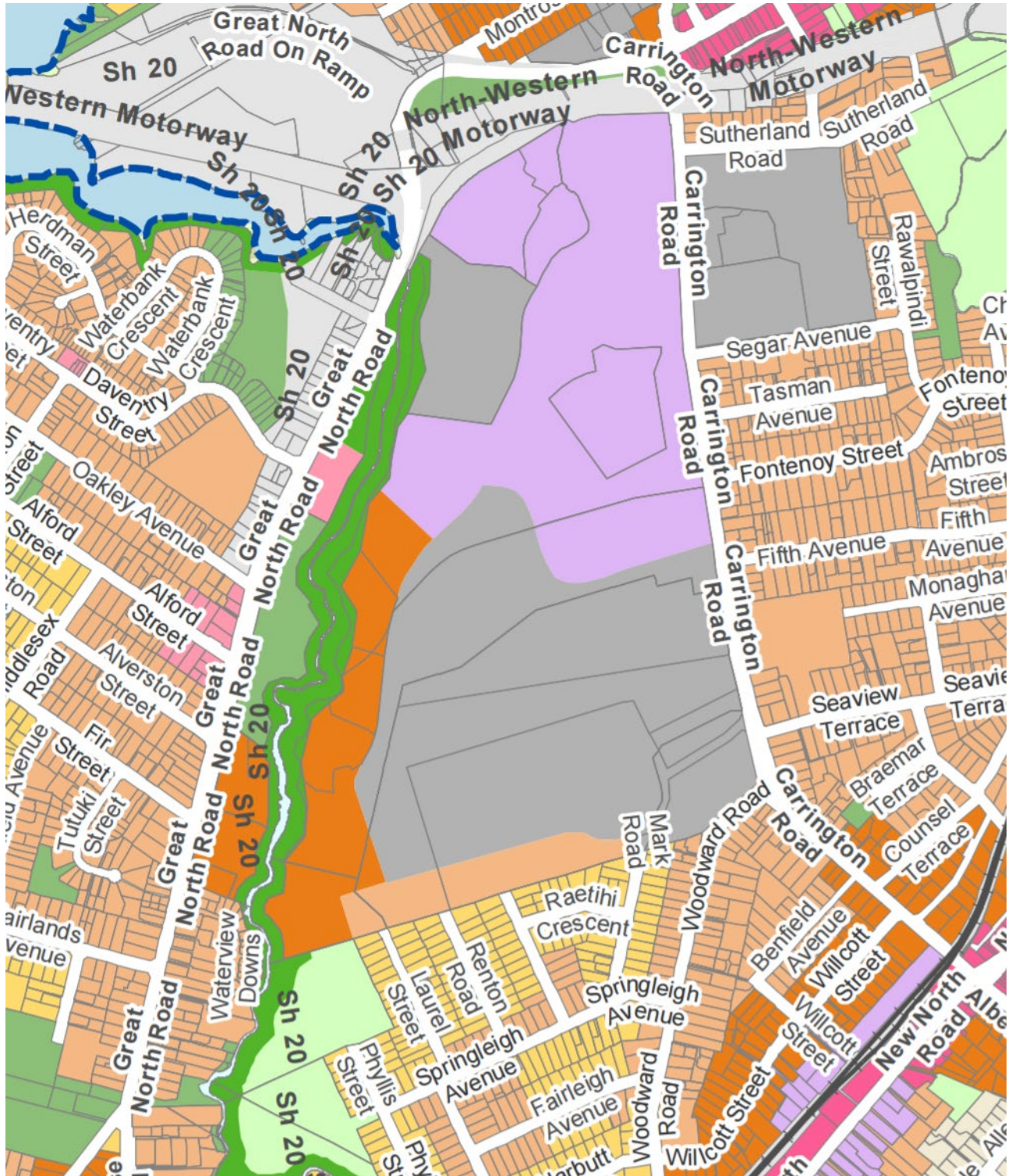


Figure 5.1 Auckland Unitary Plan Land Use

The zoning and the Precinct rules provide for the development of a diverse urban community with a variety of housing typologies and commercial services, alongside a health facility, and a tertiary education facility, integrating with the surrounding Mt Albert, Waterview and Point Chevalier communities. All AUP overlay maps can be found in Appendix 2.

5.1 Auckland Unitary Plan (Operative in part)

The AUP is the planning document for Auckland that replace the former Regional Policy Statement and the 13 regional and district plans. The AUP became 'operative in part' on 15 November 2016. The AUP sets out objectives, policies and rules for development on both a city-wide scale and in the case of the Wairaka Precinct, at a site-specific scale.

5.1.1 Auckland-wide provisions

The general AUP policies for management of stormwater and flooding are covered in Section E – Auckland Wide rules, namely:

- Section E1 – Water quality and integrated management.
- Section E10 – Stormwater management area – Flow 1 and Flow 2.
- Section E36 – Natural hazards and flooding.

Policy 9 in Section E1 (Policy E1.3.8) sets out the following policies for management of stormwater runoff from redevelopment of existing urban areas:

Minimise or mitigate new adverse effects of stormwater runoff, and where practicable progressively reduce existing adverse effects of stormwater runoff, on freshwater systems, freshwater and coastal waters by:

- *Requiring measures to reduce contaminants, particularly from high contaminant-generating car parks and high-use roads.*
- *Requiring measures to reduce the discharge of gross stormwater pollutants*
- *Requiring measures to be adopted to reduce the peak flow rate and the volume of stormwater flows:*
 - *Within sites identified in the Stormwater Management Area – Flow 1 and Flow 2 Control;*
 - *Where development exceeds the maximum impervious area for the relevant zone;*
or
 - *From areas of impervious surface where discharges may give rise to flooding or adversely affect rivers and streams.*
- *Taking an integrated stormwater management approach for large-scale and comprehensive redevelopment and intensification and encourage the restoration of freshwater systems where practicable.*
- *Ensuring intensification is supported by appropriate stormwater infrastructure, including natural assets that are utilised for stormwater conveyance and overland flow paths.*

The other relevant policies from Section E1 are summarised briefly below:

- Enhance water quality, flows, stream channels and their margins (Policy E1.3.2b and Policy E1.3.3).
- Discharges must avoid contamination that will have an adverse effect on the life supporting capacity of freshwater (Policy E1.3.4).
- Discharges must avoid contamination that will have an adverse effect on health of people and communities (Policy E1.3.5).

An integrated stormwater management approach (Policy E1.3.10) must have regard to all of the following:

- The nature and scale of the development and practical and cost considerations.

- The location and design of site and infrastructure to protect significant site features and minimise effects on receiving environments.
- The nature and sensitivity of receiving environments.
- Reducing stormwater flows and contaminants at source.
- The use and enhancement of natural hydrological features and green infrastructure where practicable.
- Avoid, minimise or mitigate adverse effects of stormwater diversions and discharges (Policy E1.3.11).
- Manage contaminants in stormwater runoff from high contaminant generating carparks (> 30 cars) and high use roads (>5000 vehicles per day) to minimise adverse effects on water and sediment quality (Policy E1.3.12).
- Require Stormwater quality or flow management to be achieved on-site unless there is a downstream communal device (Policy E1.3.13).
- Adopt the best practicable option to minimise the adverse effects of stormwater discharges (Policy E1.3.14).
- Utilise stormwater discharge to ground soakage where it is possible to do so in a safe, and effective manner (Policy E1.3.15).

Section E36 sets out the policies relating to management of natural hazards and flooding. The relevant policies are summarised briefly below:

- In existing urban areas require new buildings designed to accommodate more vulnerable activities to be located:
 - (a) outside of the 1 per cent annual exceedance probability (AEP) floodplain; or
 - (b) within or above the 1 per cent annual exceedance probability (AEP) floodplain where safe evacuation routes or refuges are provided. (Policy E36.3.13)
- Ensure all development in the 100-year flood plain does not increase adverse effects or increased flood depths or velocities to other properties upstream or downstream of the site (Policy E36.3.21).
- Maintain the function and capacity of overland flow paths to convey stormwater runoff safely and without damage to the receiving environment (Policy E36.3.29) and Policy E36.3.30).

Section E10 sets out additional controls for sites identified in the Stormwater Management area control – Flow 1 and Flow 2. The Unitec site is not within this overlay.

5.1.2 AUP Precinct

The Wairaka Precinct (I334) is divided into three sub-precincts to allow for the Mason Clinic and Taylors Laundry, along with residential activities and a major tertiary education institution. Figure 5.2 on page 19 shows the Wairaka Precinct and its sub-precincts.

The Wairaka Precinct's purpose is to provide for a diverse urban community, alongside the ongoing development and operation of the tertiary education facility. Providing a variety of housing typologies will cater for Auckland's growth along with offering a range of community, recreation and social activities. The development of the precinct will ensure that the values in the surrounding areas are retained such as the Significant Ecological Area (SEA) of Te Auaunga/ Oakley Creek. Open spaces along with pedestrian and cycleway linkages will provide amenity and multi-modal transport options to the future residential community.

The stormwater management requirements for the Wairaka Precinct are given in Section I334 of the AUP. It states that a comprehensive stormwater management plan must be prepared for all land in the precinct and must:

- Be in accordance with the requirements in Requirement I334.9 (3)*.

- Demonstrate how stormwater management will be managed across the precinct or development to avoid, remedy or mitigate adverse effects.
- Apply an integrated stormwater management approach, consistent with Policy E1.3.1(10)** Water Quality and integrated management.
- Identify any areas of on-site stormwater management and provides for these in development and subdivision.
- Identify the location, extent and of any infrastructure, including communal stormwater management devices and any proposed new or upgrades to infrastructure.
- Demonstrate compliance with the Council's relevant codes of practice and infrastructure standards.

*I334.9(3) Demonstrate how stormwater will be managed in accordance with the stormwater management plan prepared for the precinct.

**E1.3.1(10) In taking an integrated stormwater management approach have regard to all of the following:

The nature and scale of the development and practical and cost considerations, recognising:

- Greenfield and comprehensive brownfield development generally offer greater opportunity than intensification and small-scale redevelopment of existing areas;
- Intensive land uses such as high-intensity residential, business, industrial and roads generally have greater constraints;
- Site operational and use requirements may preclude the use of an integrated stormwater management approach;
- The location, design, capacity, intensity and integration of sites/development and infrastructure, including roads and reserves, to protect significant site features and hydrology and minimise adverse effects on receiving environments;
- The nature and sensitivity of receiving environments to the adverse effects of development, including fragmentation and loss of connectivity of rivers and streams, hydrological effects, and contaminant discharges and how these can be minimised and mitigated, including opportunities to enhance degraded environments;
- The benefits of reducing stormwater flows and contaminants at source prior to the consideration of mitigation measures and the optimisation of on-site and larger communal devices where these are required; and
- The use and enhancement of natural hydrological features and green infrastructure for stormwater management where practicable.



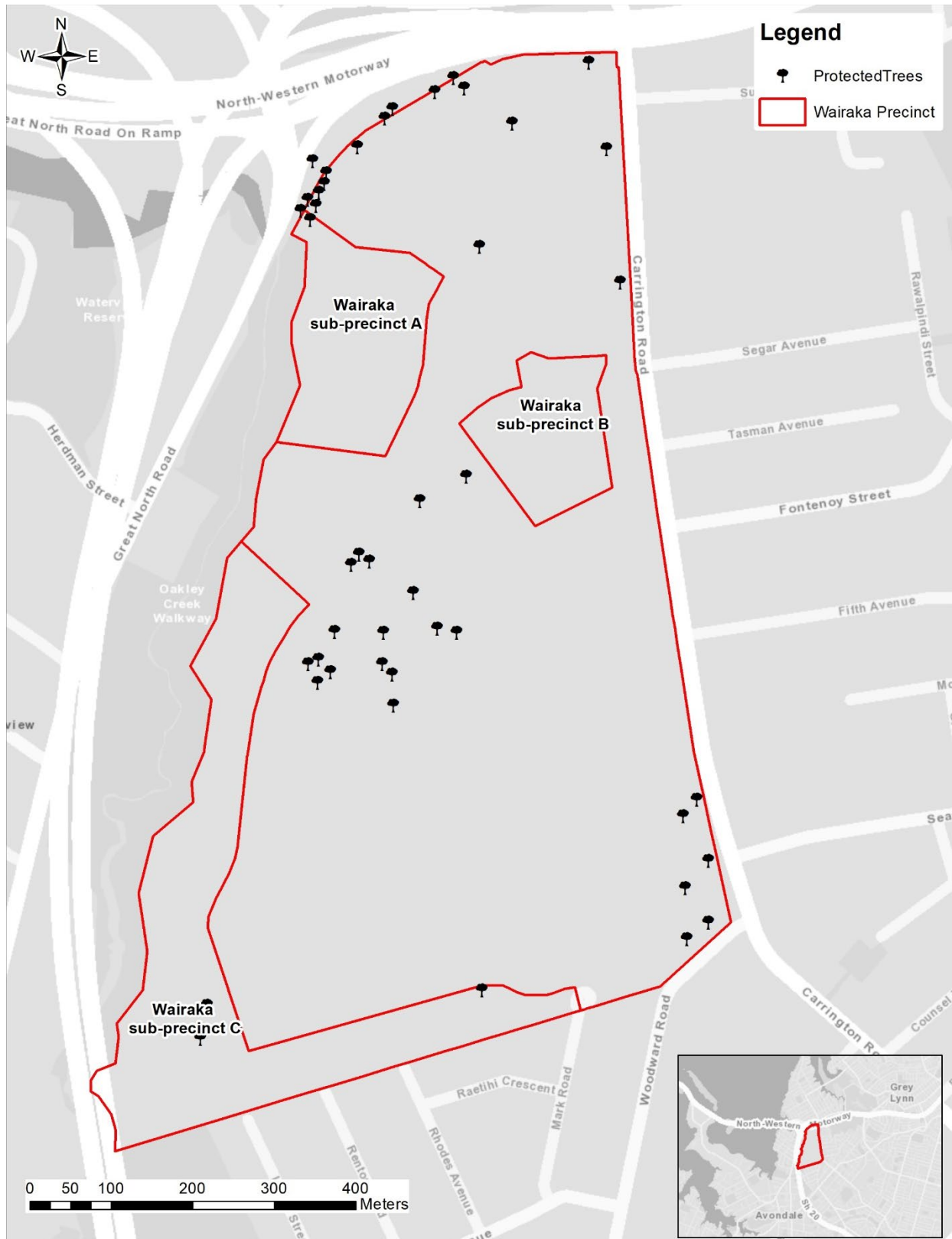
Figure 5.2 Wairaka Precinct and Sub-Precincts

5.1.3 Significant Vegetation

Significant vegetation (trees), as identified within the Wairaka Precinct, is protected, including mature native and exotic trees.

. This protection encompasses alteration, removal or works carried out within the dripline. Figure 5.3 on the next page identifies the location of the trees that are protected. A list of the protected

trees can be found in the Precinct rules. Other vegetation types identified within the Precinct comprise of mown grass, rank grass, exotic and native riparian vegetation.



5.2 Network Discharge Consents

Auckland Council currently holds two consents that cover the Wairaka Precinct. The first resource consent granted in June 2001 (Consent Number 24973) covers the Te Auaunga/ Oakley Creek catchment stormwater discharges. The second is the recently obtained Auckland Region-Wide network discharge consent (DIS60069613) for all of the existing and future stormwater diversion and discharge from the public network.

The Auckland Region-Wide network discharge consent provides for new or changes to stormwater diversions and discharges from the renewal, maintenance, development, or improvement of the Public Stormwater Network, subject to compliance with either:

- i. the performance requirements in Schedule 4; or
- ii. a Stormwater Management Plan adopted in accordance with Schedule 8.

It is intended that this Stormwater Management Plan is to be adopted in accordance with Schedule 8 and the conditions of the consent. The Stormwater Management Plan will also satisfy the Wairaka Precinct rules in the Unitary Plan requiring a comprehensive stormwater management plan to be prepared for all land in the Precinct. Following the adoption of this Stormwater Management Plan, the conditions of the historic Oakley Creek catchment consent will no longer apply to the Wairaka Precinct.

In addition, it is understood there are a number of private stormwater diversion and discharge consents covering the private stormwater network and are expected to be retained by the relevant landowners. Any stormwater network to be vested to Auckland Council will be expected to comply with this Stormwater Management Plan, Auckland Council's Stormwater Code of Practice and the Auckland Region-Wide network discharge consent. Any culverts under roads to be vested to Auckland Transport will need to be replaced and/or upgraded to comply with their requirements.

5.3 Existing Oakley Stormwater Management Plan

The Wairaka Precinct site is located at the bottom of the Te Auaunga/ Oakley Creek Stormwater Management Plan catchment. The Oakley Creek Stormwater Management Plan (Beca Carter Hollings & Ferner Ltd, 1998) was prepared to support the application for the Oakley Creek discharge consent (Consent Number 24973)

The Plan proposed solutions to address catchment wide issues and deals with stormwater flood management works, stream erosion and limited stormwater quality improvements as shown in Table 3 on the next page. The report did not highlight any improvements in relation to the Wairaka Precinct, in part due to the previous zoning and lack of development plans on the site.

The Plan and Consent (#24973) allowed for the discharge of stormwater from the Te Auaunga/ Oakley Creek catchment with an approved sediment removal target of 36% on an annual basis. However, the proposed wetland was located on private property and a variation to the existing consent (#24973) was obtained to replace the proposed device with the installation of catchpit filter bags located on heavily trafficked roads. However, it is understood that Council has not installed the catchpit filter bags or undertaken the associated monitoring required by the consent. Under the approved consent, stormwater treatment is also required on all commercial and business developments.

The Plan identified that holding tanks had little benefit in reducing peak flood flows in storms greater than the 10% AEP and states that careful management of secondary flow paths and retention of existing ponding areas will be more effective in reducing peak flows to Te Auaunga/ Oakley Creek and the impact of flooding on existing buildings.

Table 3 Summary of Recommended Works

OAKLEY STORMWATER MANAGEMENT PLAN

4

Stormwater Management Plan

TABLE 1.1 : SUMMARY OF RECOMMENDED STORMWATER MANAGEMENT WORKS			
Location	Recommended Works	Rough Order of Cost	Priority
Flood Management Works: (Costs include land take value)			
46 Craddock Street	Complete works - establish earth bund	\$5,000	High
Railway Culvert	Physical model study (completed)	\$25,000	High
New North Road	Physical model study (completed)	\$25,000	High
	Install supplementary 1500 mm dia culvert at New North Road.	\$630,000	High
May Road / Memorial Avenue	Physical model study (completed)	\$25,000	High
	Replace May Road Culvert with a bridge.	\$280,000	High
	Lower invert of Memorial Avenue Culvert.	\$140,000	High
Dominion Road	Replace Dominion Road culvert with a bridge	\$400,000	Medium
Marion Avenue	Construct flood wall at rear of properties. Raise berm and driveway crossings	\$115,000	Medium
Olsen Avenue channel	Remove Hayr Road / Melrose Road culvert restriction. Construct stopbank at culvert entrance	\$70,000	High
Molley Green Reserve	Increase detention pond capacity. Install new stormwater system	\$380,000	High
Westminster Street	Pipe secondary flow upstream of Westminster St	\$75,000	Medium
2/12 Quona Avenue	Review pipe options. Pipe secondary flow past property	\$37,500	Low
16 Quona Avenue	Pipe the secondary flow path to the 1% AEP event	\$37,500	Low
15 & 17 Gregory Place	Shape secondary flow path. New pipe system to discharge cesspits at N° 17	\$15,000	Low
Stormwater Quality Works: (Costs include land take value)			
Hendon Avenue area	Construct a wet pond / marsh including a sediment forebay, outlet to trap floating materials and a flood flow bypass channel	\$4,415,000	High
Streambank Stability Works:			
ch 1400m - 1500m	Protect Bank (left bank)	\$30,000	High
ch 2300m - 2400m	Protect Bank (left bank)	\$15,000	High
	Monitoring for ten years	total \$35,000	Medium
	Rehabilitation of immediate stream banks -all sites	total \$311,000	Low
Total all recommended works by priority:		\$6,040,000	High
		\$625,000	Medium
		\$401,000	Low
TOTAL RECOMMENDED WORKS (ALL PRIORITIES):		\$7,066,000	ALL

Table Notes: that the Hendon Park stormwater treatment device identified above was replaced with the installation catchpit filter bags on highly trafficked roads by way of a consent variation in 2001.

6. CONSULTATION AND ENGAGEMENT

Consultation with the relevant stakeholders and community groups took place for the draft SMP (March 2020) for the redevelopment of the Wairaka Precinct. Table 4 below provides a summary of the feedback received:

Table 4 Summary of Feedback

Party	Feedback
Ministry of Housing and Urban Development	Supports adoption of the SMP under Schedule 8 as an affected party.
Mason Clinic (WDHB)	Supports adoption of the SMP under Schedule 8 as an affected party.
Whai Rawa Property Holdings and Whai Rawa Development LP (Ngāti Whātua Ōrākei).	Supports stormwater management that is "over and above minimum requirements". Supports adoption of the SMP under Schedule 8 as an affected party.
Marutūāhu Rōpū (Ngāti Paoa, Ngāti Maru, Ngāti Tamaterā, Ngaati Whanaunga, Te Patukirikiri)	No formal comments received. Supports the adoption of the SMP under Schedule 8.
Waiohua-Tāmaki Rōpū (Ngāi Tai ki Tāmaki, Ngāti Te Ākitai Waiohua, Ngāti Te Ata, Te Kawerau ā Maki)	Oakley Creek should be referred to as Te Auaunga. Supports the adoption of the SMP under Schedule 8
Waiohua-Tāmaki Rōpū (Ngāti Tamaoho)	Oakley Creek should be referred to as Te Auaunga Although "the SMP provides information to support the minimum stormwater requirements" Ngāti Tamaoho always supports stormwater management that is "over and above minimum requirements" Support the retention of the Wairaka Stream and the proposed daylighting of lower sections Support the treatment of existing main roads and carparks, and at source treatment. All roads should provide for some type of treatment, even if only stormwater 360 litter traps inserted into cesspits. Supports the adoption of the SMP under Schedule 8
Unitec	No feedback received – no formal sign off required.
Norak Properties Limited (Taylors Laundry)	No feedback received – no formal sign off required.
Albert-Eden Local Board	<ul style="list-style-type: none"> The delegated board member will request the full local board to make any landowner consent decisions – includes stormwater outfalls on the banks of watercourses.

	<ul style="list-style-type: none"> • Would like to be informed before a resource consent is submitted and would like to provide feedback – same goes for any private plan changes. • Supports Friends of Oakley Creek submission. • Supports daylighting and enhancement of streams. • Does not support mixing waters from the two awa.
Auckland Transport	<ul style="list-style-type: none"> • Supports network upgrades to facilitate the additional stormwater runoff from Carrington Road widening project and/or improvements on Carrington Road which facilitate access to the Precinct. • Supports the upgrade or replacement of any culverts under roads to be vested to AT. • Supports stormwater quality treatment for the existing main internal roads (Farm Road, spine road and entrances on Carrington Road) although these roads do not require treatment under the Unitary Plan. • Acknowledge that new local roads will not require full treatment devices due to limitation of space and low contaminate generating nature. • Concern over vesting of full treatment devices when they are not identified as a priority or a requirement under the AUP. • Prefers specific references to stormwater treatment devices be removed from the SMP and that it be noted that they need to be confirmed at the time of development of said roads. • Not opposed to offline treatment of road runoff using private devices if the developers seek a higher standard than that required. • Support using the current wetlands to treat run off from the development and Carrington Road and internal roads. AT believes this is more efficient than the installation of new quality treatment devices.
Friends of Oakley Creek	<ul style="list-style-type: none"> • Wish to see the development aim for higher and more sustainable outcomes instead of only meeting minimum stormwater requirements. • Support water sensitive design and feel it should be compulsory for all works. • Concerned about stream bank erosion and scouring along the reach of Oakley Creek. • Do not support direct discharge to the Creek but prefer on-site storage and treatment and greater attenuation of flows. • Opposed to additional outfalls due to the effects on water quality, habitat and erosion. Any upgrading of outfalls should be designed and fit with water sensitive design principles and be set back from the stream channel to minimise effects on the stream banks. • Support localised stream widening of the Wairaka stream to increase the storage capacity. In addition, would like to see re-naturalising of the Wairaka stream across the precinct and the daylighting of any sections which are currently underground. • Support increasing Central Wetland flood storage capacity and would like to see consideration given to the development

	<p>of another stormwater detention pond/wetland to manage flows from mid northern part of the precinct.</p> <ul style="list-style-type: none"> • Are concerned that the proposed flooding and overland flow path management will increase the peak discharge and have a negative effect on the creek. • Support and fully endorse hydrology mitigation of retention and detention wherever possible. • Concerned over the considerable increase in imperviousness and the effect on the creek. • Support further erosion protection of any existing outfalls. • Would like further investigation to be carried out to prove that the aquifer is at or near capacity and therefore cannot support onsite retention and detention. • Strongly recommend that retention, reuse and detention be used across the precinct. • Support the proposal to reduce the risk of heavy metal contaminates by all new buildings using low-contaminate generating roofing and treatment for existing main internal roads including the installation of rain gardens and/or tree pits. • Support retention of existing wetlands to provide stormwater treatment, detention and flood mitigation. • Support the requirement for all new buildings to use low-contaminate generating roofing material. • Support requirements for erosion protection on upgraded outfalls. • Request all carparks with greater than 30 parking spaces (per development lot) be provided with at source stormwater treatment where the stormwater discharge does not already go to a stormwater treatment device within the Precinct (e.g. wetland). • Support gross pollutant traps either at source (e.g. catchpit inserts) or end of pipe for treatment of new local road corridors.
--	--

7. PROPOSED DEVELOPMENT PROPOSAL

The three Rōpū rights' holders to the Ngā Mana Whenua o Tāmaki Makaurau Collective Redress Deed, in partnership with the Crown, through the Ministry of Housing and Urban Development (HUD) propose to develop an inclusive sustainable community on the Crown holdings within the Wairaka Precinct.

The development plan for the Wairaka Precinct is set out in the Reference Master Plan and Strategic Framework (Grimshaw, 2019). It is expected that the Wairaka Precinct will be developed in line with the Auckland Unitary Plan zones outlined in Section 5 above.

Previous development plans by the Wairaka Land Company that controlled development across the majority of the Precinct are no longer applicable. Due to changes in land ownership and control including subsequent changes in the planning and design of the landowners, the management of stormwater will need to be carefully considered as the development proceeds.

Based on information obtained from landowners, an analysis has been carried out to determine the likely maximum probable impervious surfaces of development within the Precinct. This has been

used to assess the likely stormwater upgrades and stormwater management approach of the Precinct.

Stormwater flows are not always directly influenced by the number of houses or development yield but are generally more a function of the percentage of impervious surfaces within the development, which is expected to be relatively similar for different development yields or development plans, although the Crown has also expressed an intention to make use of pervious surfaces to help manage stormwater flows within the housing development.

Figure 7.1 on the next page shows the maximum probable impervious percentages of the Wairaka Precinct once developed. The site will ultimately be developed into a mixed-use precinct to create a complete community with diverse housing types and land uses.

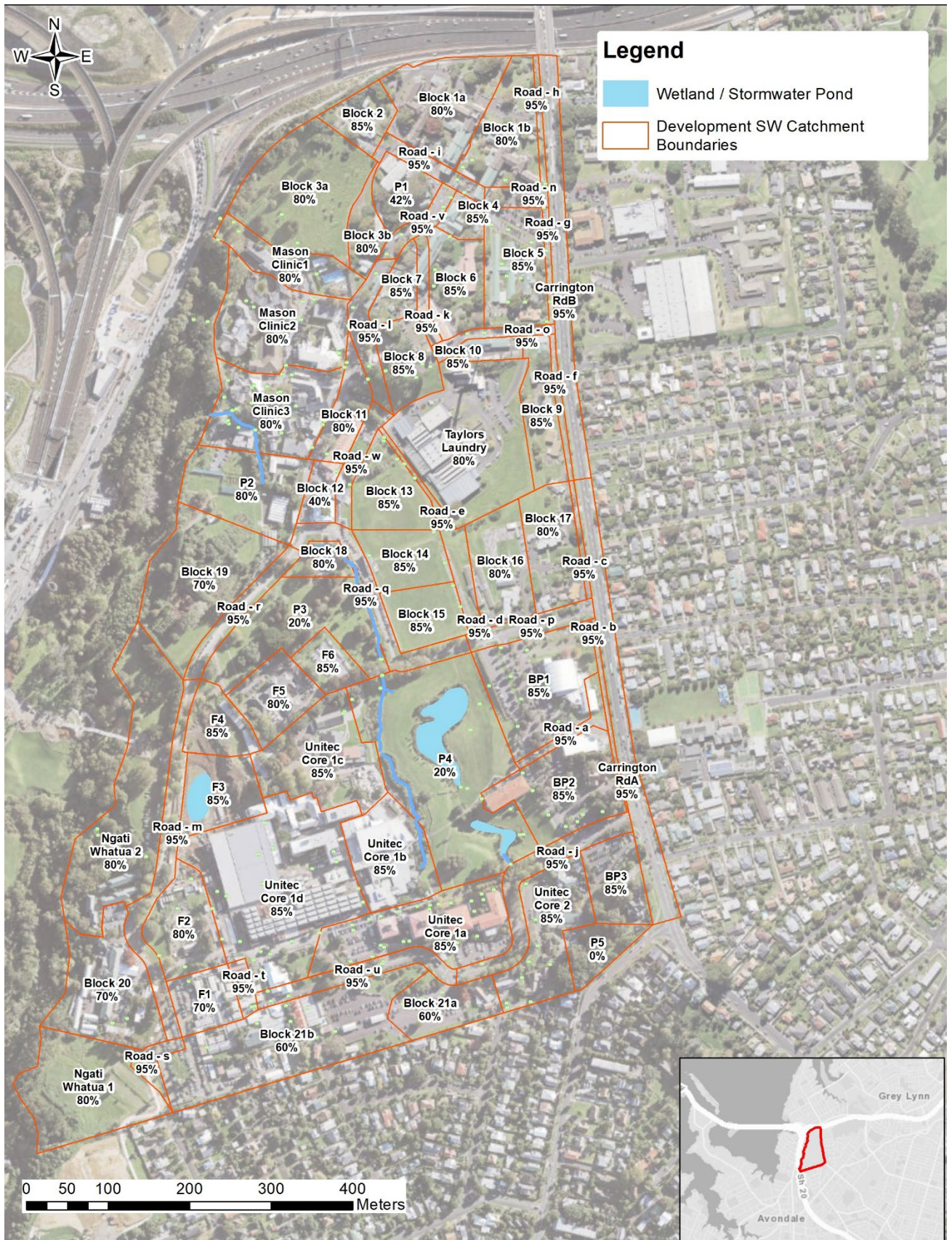


Figure 7.1 Maximum Probable Development (MPD) Scenario

8. STORMWATER MANAGEMENT APPROACH

The stormwater management approach for the Wairaka Precinct is proposed to deliver the Best Practical Option taking into account Water Sensitive Design Guidelines and Principles recognising the site is an existing brownfield development.

8.1 Water Sensitive Design Guidelines and Principles Adopted

The principles of Waste Sensitive Design are outlined below and guide the development of the Best Practical Option for the Precinct:

- Interdisciplinary approach – integrated stormwater management.
- Manage stormwater at source.
- Mimic natural systems and processes.
- Protect and enhance ecosystems.

The primary consideration for the assessment of the NDC under the AUP is the adoption of the BPO to prevent or minimise adverse effects. The BPO is provided for under section 70 (regional rules about discharges) and section 108 (conditions of resource consents) of the RMA. BPO under the RMA means the following:

best practicable option, in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to—

- (a) the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and
- (a) the financial implications, and the effects on the environment, of that option when compared with other options; and
- (b) the current state of technical knowledge and the likelihood that the option can be successfully applied.

The following subsections describes the proposed management approach to meet the adopted stormwater management requirements, alternative solutions considered and why the proposed mitigation measures have been deemed to be the BPO.

The management approach has been based on the proposed development impervious percentages, and an overall solution has been proposed to manage stormwater and mitigate flooding on the Wairaka Precinct site. The solution involves upgrades and realignment of existing pipes, installation of new drainage assets and treatment devices in the road corridor where appropriate and daylighting the full length of the Wairaka Stream to improve ecological outcomes and recognise its cultural significance.

In addition, the proposed management approach reflects the limitations of the existing and future ownership structure of stormwater infrastructure within the Precinct.

8.2 Stormwater Conveyance

Modelling of the existing pipe network and extents of flooding indicates that significant pipe upgrades are required to allow development to proceed. Using the model, a stormwater network upgrade solution was developed based upon the potential maximum probable impervious percentages in Section 7. The overall solution has been developed to provide stormwater conveyance (10-year ARI storm events) and mitigate flooding on the Wairaka Precinct site, where practical to allow development to proceed. The proposed network upgrades are shown in Figure 8.1. Flooding and overland flow path management is further expanded upon in Section 8.3.

In developing the solution, Auckland Council Healthy Waters planning, and modelling staff advised that there is sufficient capacity within the Te Auaunga/ Oakley Creek channel to take additional stormwater flow from the Wairaka Precinct for the 10-year and 100-year ARI storm events. In addition, as the site is located at the bottom of the Te Auaunga/ Oakley Creek catchment, it is preferable to convey flows quickly to Te Auaunga/ Oakley Creek and out into the harbour to minimise the risk that the peaks of the stormwater hydrographs from the upstream catchments and the Wairaka Precinct coincide, causing higher peak flows within the Te Auaunga/ Oakley Creek gully. Therefore, a direct discharge to Te Auaunga/ Oakley Creek would be an appropriate method to mitigate the effect of higher stormwater flows, and consequently no on-site flood storage or attenuation would be required within the Unitec site for either the 10 year or 100-year ARI storm events. This is consistent with the current Oakley Catchment Management Plan.

The maximum probable impervious percentages were used to identify which pipes needed to be upgraded in order to alleviate flooding issues and provide capacity for development. Approximately two to three additional outfalls are required to divert overland flows to Te Auaunga/ Oakley Creek, and this will assist in decreasing the load on existing infrastructure and therefore the need to upgrade existing outfalls.

Additional outfalls may be required as the planning and design progresses or due to changes in the staging of the development. Existing pipes and outfalls may also need to be upgraded and/or replaced to satisfy Auckland Council requirements for vesting stormwater assets. Upgrades to existing outfalls, and new outfalls, will be designed to fit within the Water Sensitive Design principles.

To prevent the Wairaka Stream overtopping onto Farm Road, a 200mm berm is proposed to be constructed on the true right bank (facing downstream) along the section of stream between Farm Rd and the large culvert. The berm, along with localised stream widening will ensure the stream does not cause flooding to surrounding infrastructure. Alternative options through the design phase may need to be considered including provision for a diversion of excess flows along Farm Road or the use of the proposed new stormwater network along Farm Road.

The proposed solution involves significant upgrades and realignment of existing pipes, installation of new drainage assets, and daylighting the full length of the existing Wairaka Stream as shown in Figure 8.1. Stormwater runoff will be conveyed in the existing pipe network which will undergo upgrades and improvements to ensure it has the capacity to convey the 10-year ARI rainfall event.

For events greater than the 10-year ARI, up to the 100-year ARI, flows will be conveyed as overland flow, typically in the road reserve. At key locations, additional inlet capacity over and above the 10-year ARI will be provided to intercept flood waters, reducing downstream flood risks.

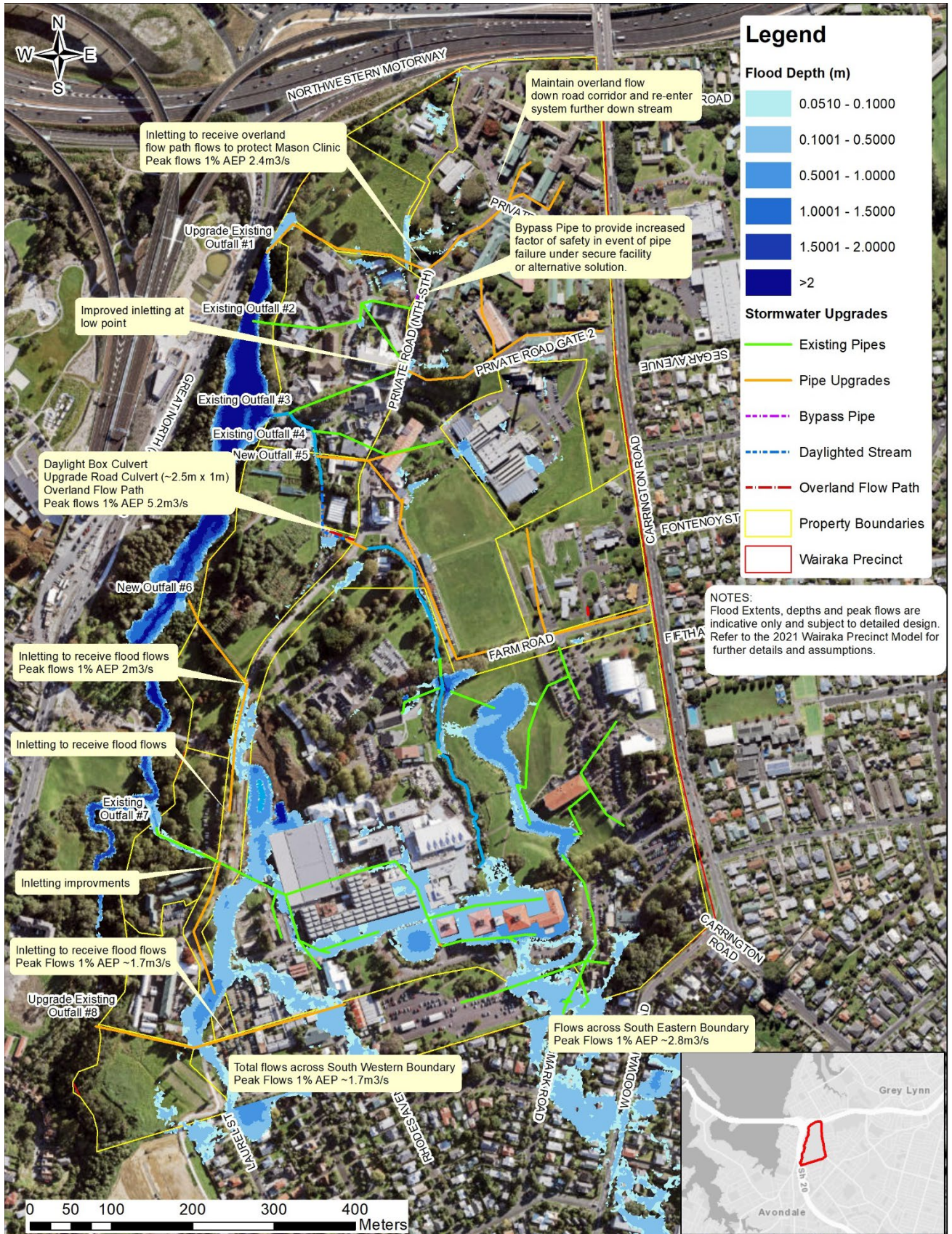


Figure 8.1 Proposed Stormwater Upgrades

8.3 Flooding and Overland Flow Path Management

The overland flow paths and flood plains on Council's GIS website can be inaccurate due to existing built obstructions (e.g. block walls along the southern boundary of the Precinct) and the limitations of the data used at the time the model was developed.

The updated 2021 Wairaka Precinct Stormwater Model has been used to assess the overland flow paths and flood plains and will be used in the future management of stormwater on the site (refer to Figure 4.2) including to assess changes in overland flow paths and flood risks.

The proposed redevelopment will change overland flow paths and flood plains through the placement of buildings, earthworks, and reshaping/development of road corridors. Therefore, careful management in processing and tracking land use consents, engineering plan approvals and work on site is required to ensure any effects are mitigated and managed appropriately.

The risk of flooding within the Precinct is generally associated with current bottlenecks in the stormwater network and flood waters from the upstream southern residential catchment. Two overland flow paths enter the south eastern and south western corners of the Precinct, generated from the upstream catchment.

The south-west overland flow path is generated when the soakage network exceeds capacity at the end of Laurel Street and the excess flows through the Precinct. The construction of the shared cycleway has accounted for the overland flow path and provides a bridge for the stormwater to flow under and enter via a catchpit and into the stormwater network discharging to Te Auaunga/ Oakley Creek. This catchpit does not have sufficient capacity for the 10-year or 100-year peak flows, so flows continue north through the development. The Farm Road embankment and stormwater culverts also provides some existing flood attenuation on the downstream catchments.

The south-east incoming flood waters enter the site at about Mark Road. Excess flows travel along a natural overland flow path through the site and ultimately discharges to Te Auaunga/ Oakley Creek. However, the flood waters present an inundation risk to the existing Unitec Education facilities

The existing south-east overland flow path passes between existing Building U4 and proposed carpark Building U2, refer to Figure 8.2 on the next page for building locations. The natural ground in this area drops down towards Building U4, putting this building at risk of flooding in a large rainfall event (when the pipe network capacity upstream is exceeded).

To manage this overland flow, Unitec holds a resource consent R/LUC/2014/3486, that allows for the modification of the south east overland flow path as shown in Figure 8.2. It is understood that a retention structure such as a retaining wall or raised garden may be constructed along the western edge of the flow path, containing the surface water within the carriageway of the internal road (between Buildings U4 and U2) before discharging into the open space area to the north.

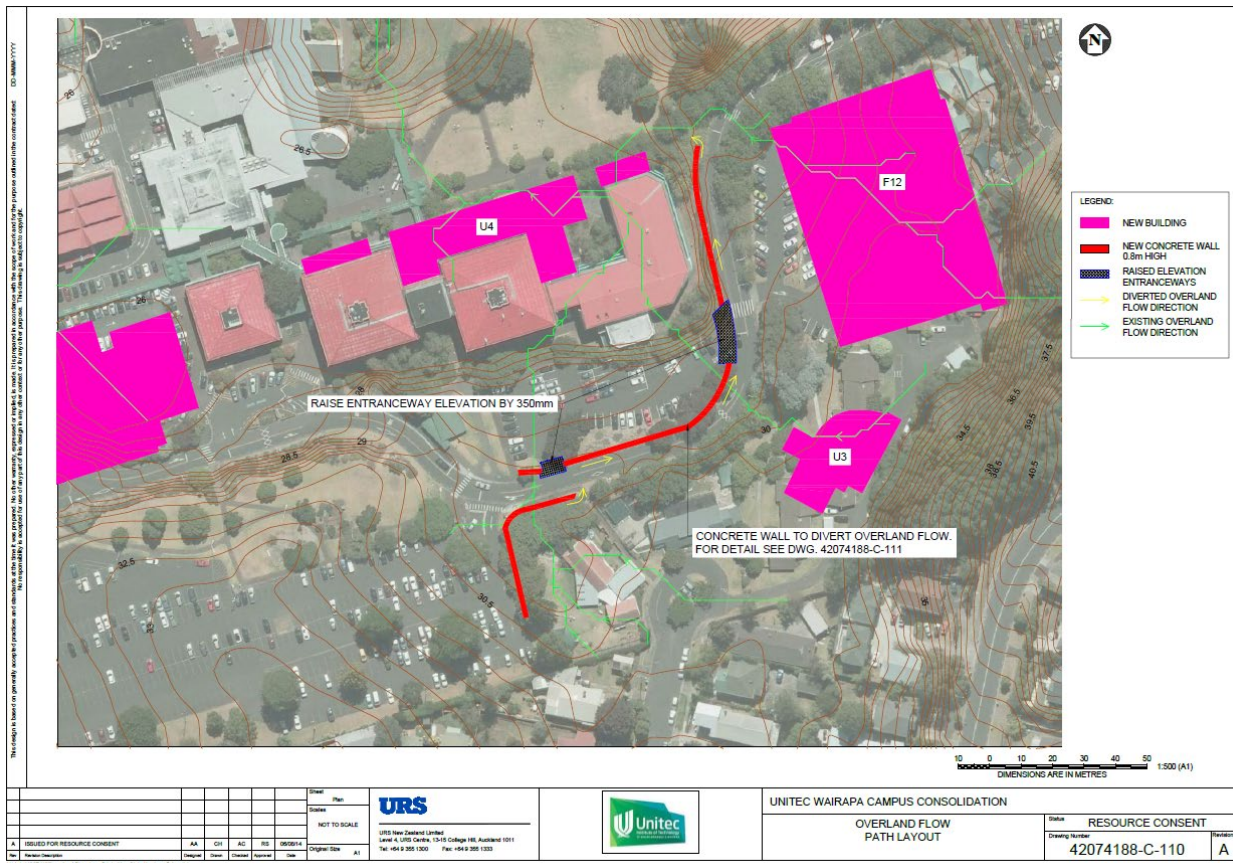


Figure 8.2 Overland Flow Path Modification (R/LUC/2014/3486)

Redevelopment of the Wairaka Precinct can alleviate much of the flooding and overland flow path risks through additional pipe networks, stormwater diversions and upgrades to the existing network outlined above.

8.4 Hydrology mitigation

Hydrological mitigation in the context of the AUP refers to minimising or mitigating changes in hydrology from changes in the imperviousness of a catchment and is predominantly related to mitigating erosion and stream bank instability and creating conditions that support healthy aquatic ecosystems such as maintaining base flows in streams.

This is controlled in the AUP by the Stormwater Management Area Flow (SMAF) provisions in Section E10:

- Retention (volume reduction) of the first 5 mm of runoff from impervious surfaces; and
- Detention (temporary storage) of the difference in runoff volumes from a pre-development and post-development 95th percentile, 24-hour rainfall event minus the retention volume.

Where retention cannot be achieved, this water volume can be managed by detention.

It is noted that Te Auaunga/ Oakley Creek including the Wairaka Precinct has not been identified as a SMAF area within the Unitary Plan and E10 rules do not apply. However, due to the redevelopment increasing impervious areas from approximately 43% to approximately 70-80%, the increased volume and flows of stormwater still need to be considered and mitigated if required. This is typically done by mitigating changes in hydrology through pipe upgrades and diversions and storage of flows in detention devices if required.

In assessing if stormwater retention and detention are required, the existing situation and receiving environments need to be assessed and considered. Impacts of the changes of imperviousness and stormwater runoff need to be assessed firstly on the Wairaka Stream and secondly on Te Auaunga/ Oakley Creek as the freshwater watercourse receiving environments impacted by redevelopment of the Wairaka Precinct. Thirdly, consideration of the Basalt aquifer ground water levels will be considered, as this aquifer feeds both watercourses.

The Wairaka Stream base and banks consist predominantly of basalt rock and this is not considered to be susceptible to erosion or streambank instability. The stream is predominantly fed during dry weather by a spring and base flows from the Central Wetland that is, itself, predominantly sourced from rainfall that enters the aquifer upstream of the Precinct. Therefore, base flows are unlikely to be affected by redevelopment within the Precinct.

Stormwater flows to the Wairaka Stream predominantly enter the watercourse via the Central Wetland with the majority of the flows coming from the upstream public stormwater network. It is noted that the stormwater catchment upstream of the Precinct is for the most part, predominantly developed and is unlikely to experience a significant change in imperviousness.

The existing Central Wetland has a volume of approximately 4,000 m³. This pond is designed to detain large volumes of rainfall for the Precinct and the upstream catchment. The detention volume of the Central Wetland could be increased to improve flow management subject to agreement with Unitec, but this is not proposed within this SMP. The SMP however, does assume the Central Wetland will continue to perform its existing management functions. In addition, network upgrades and diversions directly to Te Auaunga/ Oakley Creek will further mitigate any increase in impervious surfaces and associated peak flows. Therefore, additional retention and detention of stormwater flows is not required for stormwater catchments that drain to the Wairaka Stream.

It is important to consider the stormwater contribution that the Wairaka Precinct makes to the Te Auaunga/ Oakley Creek catchment, as a large land area upstream of the Precinct drains directly to Te Auaunga/ Oakley Creek. The Wairaka Precinct represents approximately 5% of the total catchment land area that drains to the Creek. Therefore, any changes to the existing impervious surfaces within the Precinct are expected to have less than a 2% impact on the peak flows within Te Auaunga/ Oakley Creek and any consequent stream erosion. However, stormwater flows from the Wairaka Precinct will nevertheless be well distributed along the stream bank through the placement and design of the new and upgraded outfalls. Erosion protection will minimise the impact of the increased stormwater flows from the Precinct on Te Auaunga/ Oakley Creek.

In addition, a Bank Stability and Toe Erosion Model (BSTEM) study was carried out by Auckland Council which produced a report assessing erosion on the banks of Te Auaunga/ Oakley Creek as it passes through Phyllis Street reserve 500 metres upstream of the development. The BSTEM table indicates that erosion in and adjacent to Te Auaunga/ Oakley Creek is not caused by small storm events, it is driven by storm events larger than the 1-2 ARI. For erosion to occur, the boundary shear stress must be larger than the critical shear stress required to entrain stream bank materials. Larger storm events result in larger shear stresses on stream banks. For erosion to take place on the stream banks the critical erosion factor has to be greater than 1. Therefore, based on the BSTEM results, detaining the 95th percentile (3-4 month) storm event will have no effect on erosion issues as the critical shear strength will not be exceeded. This would also apply to smaller events such as a 5mm retention event.

The use of hydrology mitigation is deemed to not be required within the Wairaka Precinct due to the following:

- There is only one identified erosion hot spot in the Te Auaunga/ Oakley Creek reach which the Wairaka Precinct will discharge to. Outfall design and erosion protection measures will ensure it is not exacerbated.
- The catchment is not within a SMAF zone.

- The Wairaka Precinct is located at the downstream end of the Te Auaunga/ Oakley Creek Stormwater catchment.
- Small storm detention onsite will likely negatively impact Te Auaunga/ Oakley Creek by coinciding flow from the Precinct with peak flows in the main channel, thereby increasing shear stresses and the erosion potential in Te Auaunga/ Oakley Creek.
- Erosion protection around all outfalls will be able to manage effects.

Hydrological mitigation (particularly detention/ retention) is not preferred against the measures proposed in this SMP, as the evidence suggests the effects from the proposed flows are no more than minor. Prompt discharge of stormwater, so as to avoid coinciding peak flows, will provide a better outcome for managing erosion in Te Auaunga/ Oakley Creek. Similarly, water reuse is not proposed as a hydrological mitigation in this location, for the reasons discussed above.

The third and final receiving environment that requires consideration is the basalt aquifer below the Precinct. The aquifer is predominantly recharged by rainfall entering the aquifer through infiltration and stormwater discharges to existing private and public soak holes in the upstream catchment.

As the ground water level is at or near the surface in several locations (as indicated by springs and field observations) within the Precinct, the aquifer is considered to be at or near capacity. Therefore, soakage or infiltration to ground is not practical or feasible due to existing groundwater levels. In addition, any additional flows to ground would have minimal to no impact on the stream base flows of Te Auaunga/ Oakley Creek or the Wairaka Stream. If development sites were to explore the use of soakage or infiltration onsite, then detailed groundwater investigations will be required to be undertaken.

In conclusion, no stormwater retention or detention of stormwater flows beyond the existing measures are proposed to be required on site as these will not improve the stormwater management within the site or contribute to related objectives such as managing erosion within Te Auaunga/ Oakley Creek or improving water quality. However, stormwater reuse may be considered appropriate for sustainability purposes (e.g. to minimise household water use or promote careful water use habits) but these are outside the scope of this SMP.

8.5 Water Quality

Stormwater runoff from urban development has the potential to collect and transport contaminants into receiving environments. The primary contaminants of concern are particles related to activities on surfaces such as roofs, roads and carparks.

The current site has the following high contaminant generating activities:

- Roads – key pollutants from road runoff include sediment, oil and grease, total and dissolved metals and gross pollutants.
- Roofs – Some of the existing buildings are old and therefore runoff from the roofing materials can contain high concentrations of heavy metals (total and dissolved).
- Carparks – Uncovered parking areas key pollutants include sediment, oil and grease, total and dissolved metals and gross pollutants.

An additional impact of urbanisation is the potential increase in water temperature from stormwater runoff.

To reduce the risk of heavy metal contaminants entering the stormwater system, the use of pre-painted steel roofing will be required for all new roofs. Low contaminant generating roofs will decrease the risk of runoff contamination and do not require further treatment. Hard surfaces such as footpaths and hard stand areas (excluding carparks or other high contaminate generating surfaces) do not generally require stormwater treatment as any runoff will generally have extremely low, if any, levels of contaminants. Any hardstand areas likely to generate high levels of

contaminates shall be provided with appropriate stormwater treatment. These measures shall be identified and determined during the design phase of any development.

High use roads under the AUP are defined as roads with greater than 5,000 vehicles per day. No roads within the Precinct are expected to reach this level of traffic load. It is expected that the impervious surfaces of the main road corridors will not change significantly and therefore will not trigger the requirement under the Unitary Plan for treatment to be retrofitted when upgraded.

However, to achieve the best environmental outcome for the Precinct, it is proposed that stormwater treatment to improve water quality for the existing main internal roads within the Precinct is provided. The main road areas identified for treatment are the existing Private Roads (Farm Road/ Gate 3 and the connector roads running north and south through the Precinct between its two entrances (Gate 1 and Gate 2)) onto Carrington Road. It is proposed that new local roads and the impervious area of development lots are not required to have full treatment devices installed due to the low contaminate generating nature of these impervious areas. However, devices may be installed where practicable on lots by choice and on any new local roads with agreement from Auckland Transport. The proposed approach allows for stormwater treatment devices and improvements to be targeted, thus providing the maximum benefit to overall water quality outcomes.

Any water quality measures proposed for intercepting road runoff will be confirmed through consultation with Auckland Transport at the time of development.

8.6 Summary Stormwater Management Approach

A review of existing information and model simulations have been utilised to develop an overall stormwater management solution for the Wairaka Precinct as shown in Figure 8.1 and summarised below. The overarching solution adequately addresses the stormwater management issues associated with redevelopment, including stormwater conveyance, flooding, erosion, and water quality. Additional modelling of options and refinement of the overall solution will be required as design and development proceeds to ensure the outcomes of this Stormwater Management Plan are achieved.

The following stormwater requirements will be implemented on the Wairaka Precinct site:

- All new buildings will use low-contaminate generating roofing material.
- Treatment is d for the backbone roading network to stormwater enhance outcomes, in consultation with Auckland Transport, noting the. future public roads are unlikely to meet the threshold at which stormwater quality treatment must be provided.
- Stream enhancement and increases to capacity will take place along various reaches of the Wairaka Stream where practical and in keeping with desire to enhance the natural character and ecological qualities of the Stream.
- Additional stormwater outfalls to Te Auaunga/ Oakley Creek are proposed, including upgrading existing outfalls where required, but with appropriate setbacks, plantings, and other erosion protection consistent with water sensitive design to minimise the impact on the Creek.
- Stormwater network extensions and upgrades to ensure the system can convey runoff from the 10 and/or 100-year ARI storm events.
- Concentration of overland flow paths within road corridors, including improved and high-capacity catchpit inlets.
- Daylighting of the Wairaka Stream through removal of the 130m box culvert.
- New stormwater culverts under Farm Road.
- Diversion of stormwater flows at key locations (inlet improvements) to reduce flood risk of downstream properties.
- A new 200mm high berm on the true right bank (facing downstream) of the section of the Wairaka Stream between Farm Rd and the large culvert.

- All carparks with greater than 30 parking spaces (per development lot) will be provided with at-source stormwater treatment where the stormwater discharge does not already go to a stormwater treatment device within the Precinct (e.g. wetlands).
- Gross pollutant traps will be considered at the design stage of the development either at source (e.g. catchpit inserts) or end-of-pipe for treatment of new local road corridors in consultation with Auckland Transport as to requirements.

Through implementation of the above, almost catch all flooding within the Wairaka Precinct can be managed appropriately allowing the land to be intensified as envisaged in the Auckland Unitary Plan. The exception is flooding around the Central Wetland and the gully area south of the Farm Road twin culverts (see Figure 8.1). Both areas are proposed to remain part of the Stream corridor and green space and no buildings will be developed in this area. Flooding that is represented in the model as 0.05 metres or less, can be classified as sheet/overland flow and dealt with through contouring of the land through redevelopment works to concentrate flows within the future public road corridors.

9. SMP IMPLEMENTATION

9.1 Staging/Timing

The Wairaka Precinct will be developed in stages over a number of years. The proposed stormwater upgrades and improvements will be required to be reviewed as each stage progresses and prior to implementation to ensure that stormwater runoff and flood risk is actively managed, and buildings are not placed at a greater risk than the existing situation.

9.2 Ongoing Ownership Maintenance and Management Responsibilities

Operation and maintenance of the existing stormwater within the Wairaka Precinct lies with the landowners of parcels associated with Unitec, the Mason Clinic, HUD, Taylor's Laundry and Ngāti Whātua Ōrākei. Further discussion is required to be held between all parties and Auckland Council to determine the extent of stormwater assets to be vested to Auckland Council and the staging requirements of stormwater infrastructure upgrades.

It is likely that stormwater infrastructure within the Precinct will remain private until such time as lots are redeveloped, and new stormwater infrastructure is constructed and vested. All devices to be vested to Auckland Council must be in accordance with its Code of Practice and design must include full lifecycle consideration of ongoing maintenance obligations.

It is noted that any discharges through existing private stormwater outfalls cannot be authorised by Auckland Council's Regionwide Network Discharge Consent and will be covered by private discharge consents where applicable. However, developer agreements may provide a mechanism to ensure existing and new assets are properly operated and maintained prior to vesting to Council. Existing stormwater culverts under road corridors will be required to be replaced prior to vesting of these roads to Auckland Transport.

The operation, maintenance and monitoring requirements shall be determined during the design and engineering plan approval stages.

10. CONCLUSION

The Stormwater Management Plan provides the proposed stormwater management approach for the Wairaka Precinct. This Stormwater Management Plan demonstrates that the proposed stormwater management is the best practical option, taking into consideration the existing site features, and the brownfields nature of the development. The report provides a solid basis of information that can be used by Auckland Council in assessing development and subdivision applications within the Wairaka Precinct. It is recommended that this Stormwater Management Plan be adopted through Schedule 8 of the Region-wide Network Discharge Consent. The requirements laid out in the AUP provide the basis for the stormwater management approach.

The outcomes achieved by the Stormwater Management Plan are:

- An integrated stormwater management approach that mitigates the impact of existing and future land use.
- The creation of developable land for mixed and residential land use to support brownfield intensification in Auckland.
- Enhancement of the Wairaka Stream, including daylighting the lower sections where practical.
- Use of low-contaminate generating roofing material.
- Treatment for existing main road corridors and carparks that do not discharge to an existing treatment device.
- Removal of large car parking areas with no treatment devices.
- Upgrades to the stormwater pipe network and overland flow paths to convey flows to Te Auaunga/ Oakley Creek.
- Conveyance of 10-year and 100-year ARI stormwater flows to Te Auaunga/ Oakley Creek.

The Stormwater Management Plan proposes no changes to Unitec's landholdings, and therefore assumes the retention of the water quality treatment and detention in the existing wetlands.

Stormwater re-use on-site and additional water quality treatment devices can be considered on a case-by-case basis by landowners for sustainability purposes.

APPENDIX 1: A3 PLANS



Legend

- Gates
- Wairaka Precinct Boundary
- Freehold Owners Wairaka

0 50 100 200 300 400 Meters

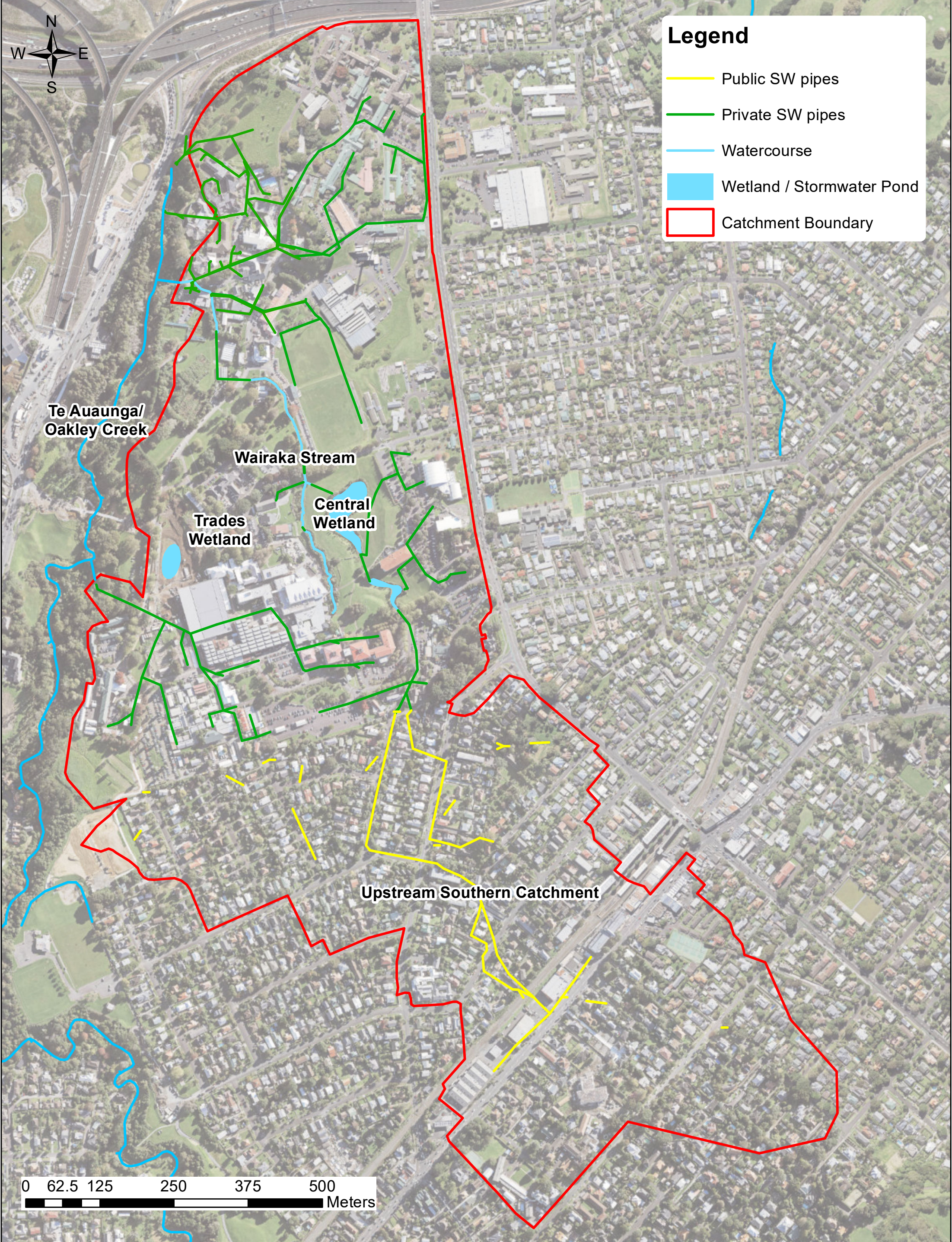


**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**

DATE: 29 APRIL 2021 DRAWN: PJ CHECKED: SM SCALE (A3) 1:4,000

**EXISTING SITE AND SURROUNDS
FIGURE 3.1**

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



Legend

- Public SW pipes
- Private SW pipes
- Watercourse
- Wetland / Stormwater Pond
- Catchment Boundary

Te Auaunga/
Oakley Creek

Wairaka Stream

Trades
Wetland

Central
Wetland

Upstream Southern Catchment

0 62.5 125 250 375 500
Meters



**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**

DATE: 7 MAY 2021

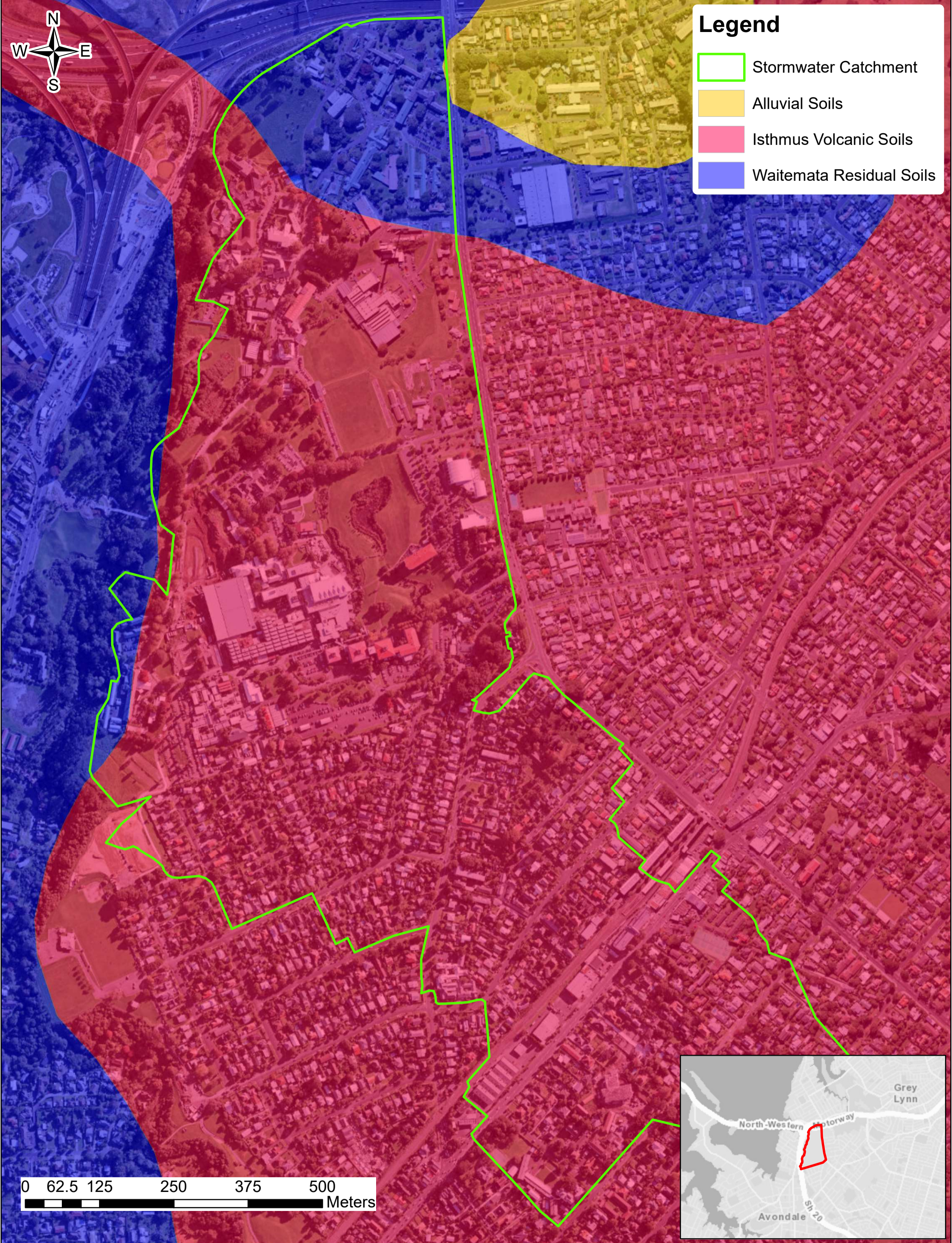
DRAWN: PJ

CHECKED: SM

SCALE (A3) 1:5,500

**STORMWATER CATCHMENT
FIGURE 3.3**

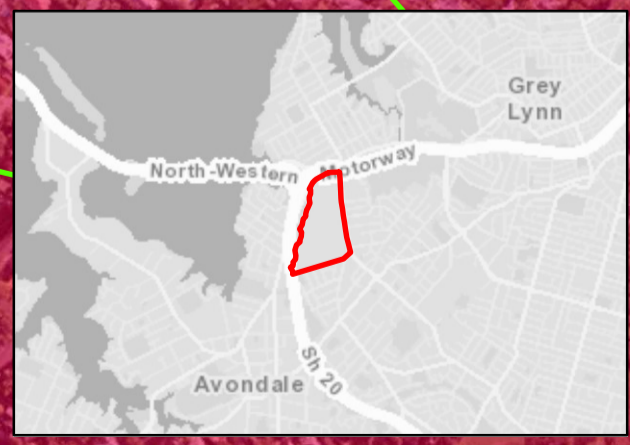
While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



Legend

- Stormwater Catchment
- Alluvial Soils
- Isthmus Volcanic Soils
- Waitemata Residual Soils

0 62.5 125 250 375 500 Meters



**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**
DATE: 7 OCTOBER 2020 DRAWN: PJ

CHECKED: SM SCALE (A3) 1:5,500

**SOIL TYPES
FIGURE 3.4**

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**

DATE: 29 APRIL 2021

DRAWN: PJ

CHECKED: SM

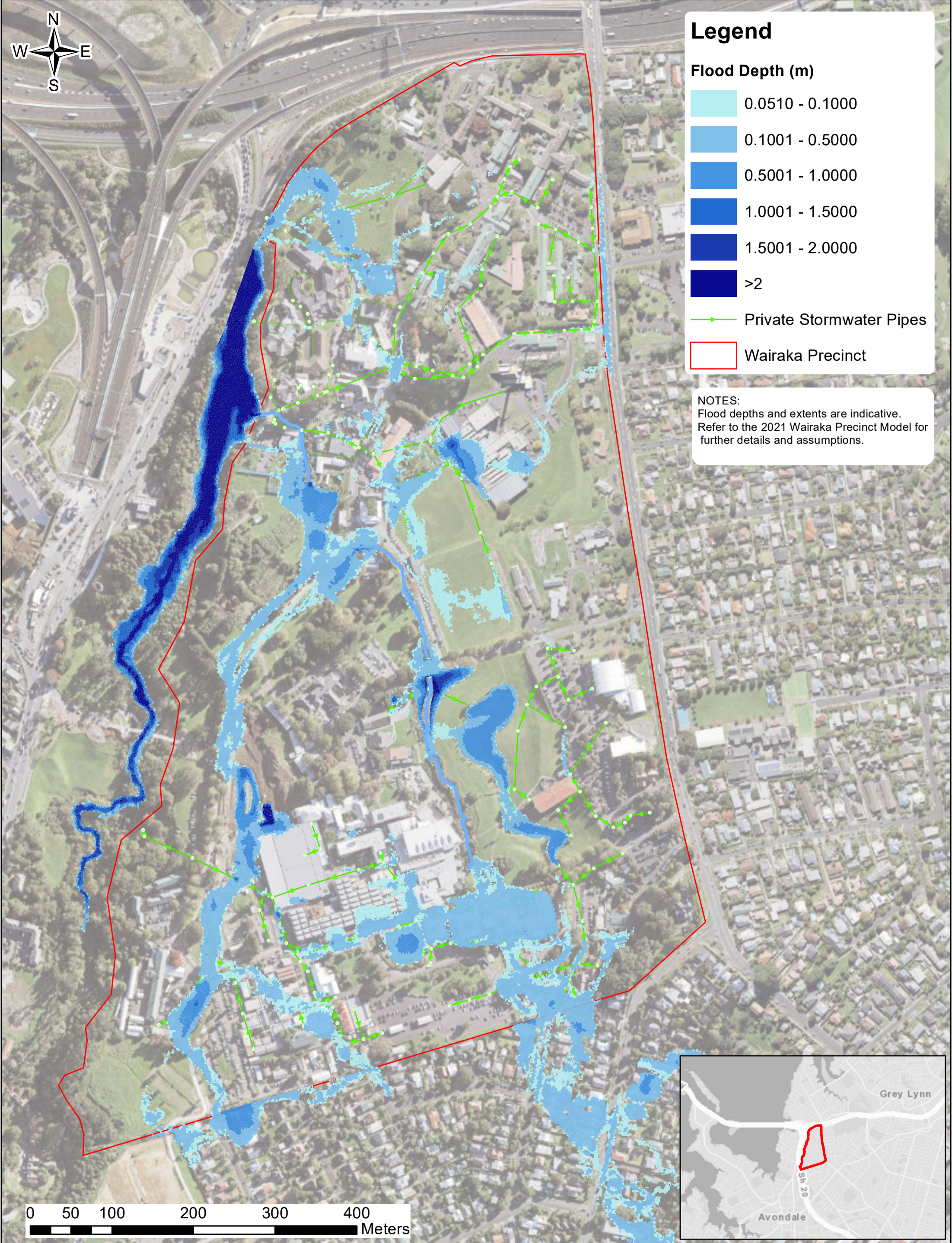
SCALE (A3)

1:4,000

**EXISTING STORMWATER NETWORK
FIGURE 4.1**



While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



Legend

Flood Depth (m)

- 0.0510 - 0.1000
- 0.1001 - 0.5000
- 0.5001 - 1.0000
- 1.0001 - 1.5000
- 1.5001 - 2.0000
- >2

- Private Stormwater Pipes
- Wairaka Precinct

NOTES:
 Flood depths and extents are indicative.
 Refer to the 2021 Wairaka Precinct Model for further details and assumptions.

0 50 100 200 300 400 Meters



WAIRAKA PRECINCT STORMWATER MANAGEMENT PLAN

DATE: 25 FEBRUARY 2021 DRAWN: PJ

CHECKED: SM

SCALE (A3): 1:4,000

EXISTING FLOODING CURRENT NETWORK

100 YEAR ARI

FIGURE 4.2

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.

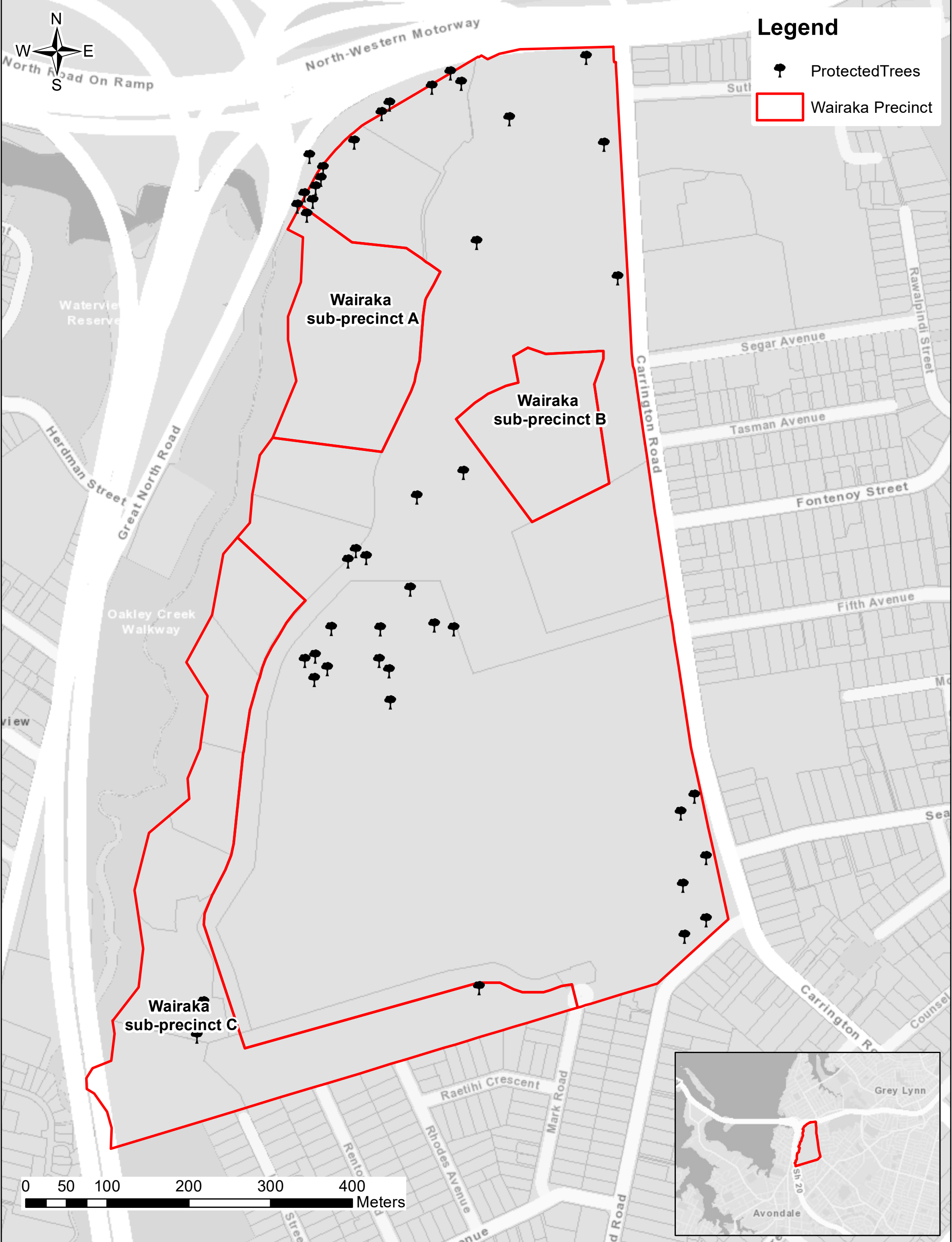


**WAIRAKA PRECINCT
 STORMWATER MANAGEMENT PLAN**

DATE: 7 OCTOBER 2020 DRAWN: PJ CHECKED: SM SCALE (A3) 1:4,000

**WAIRAKA PRECINCT
 FIGURE 5.2**

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**

DATE: 7 OCTOBER 2020 DRAWN: PJ CHECKED: SM SCALE (A3) 1:4,000

**PROTECTED TREES
FIGURE 5.3**

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**

DATE: 7 OCTOBER 2020

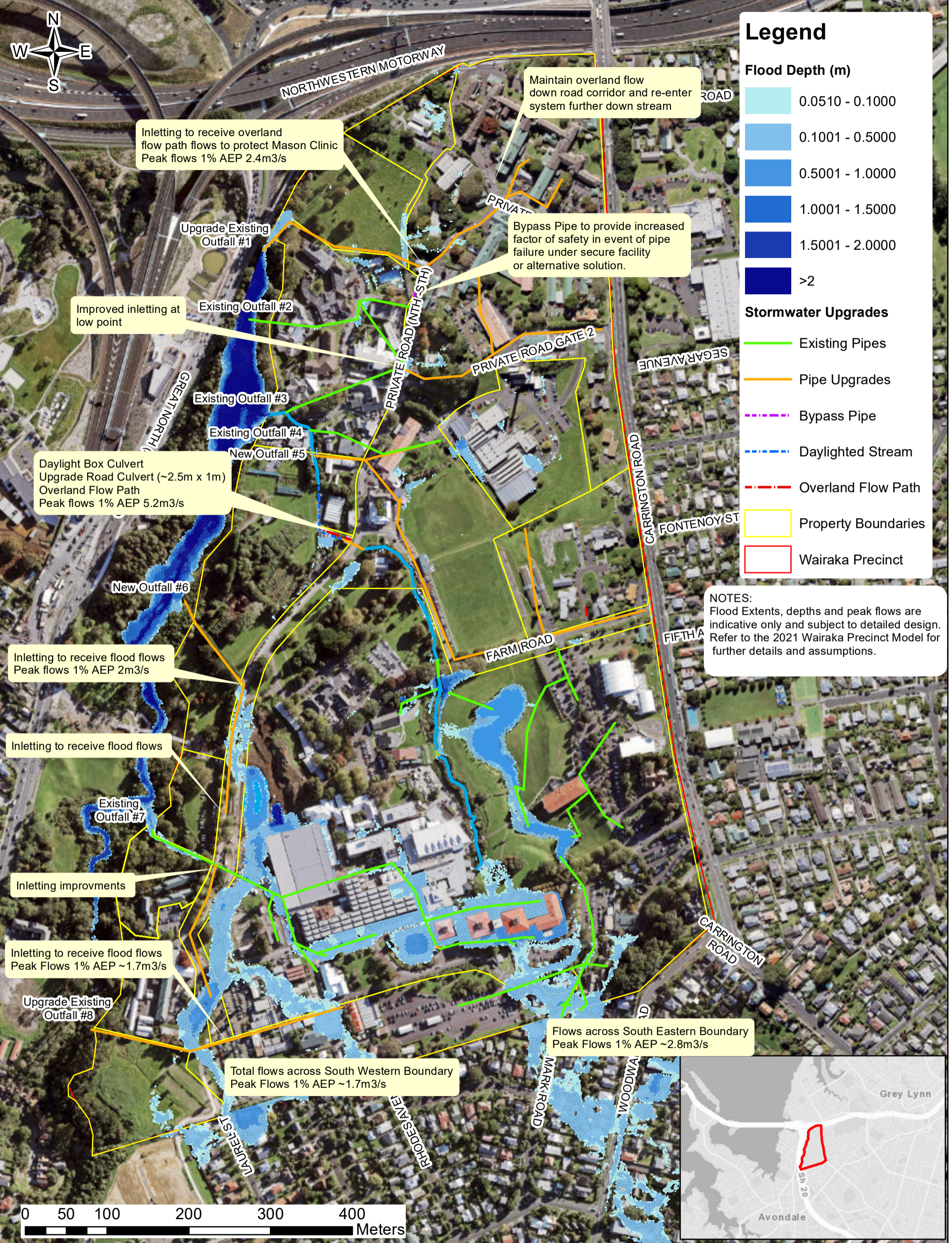
DRAWN: PJ

CHECKED: SM

SCALE (A3) 1:4,000

**MPD DEVELOPMENT SCENARIO
FIGURE 7.1**

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.



**WAIRAKA PRECINCT
STORMWATER MANAGEMENT PLAN**

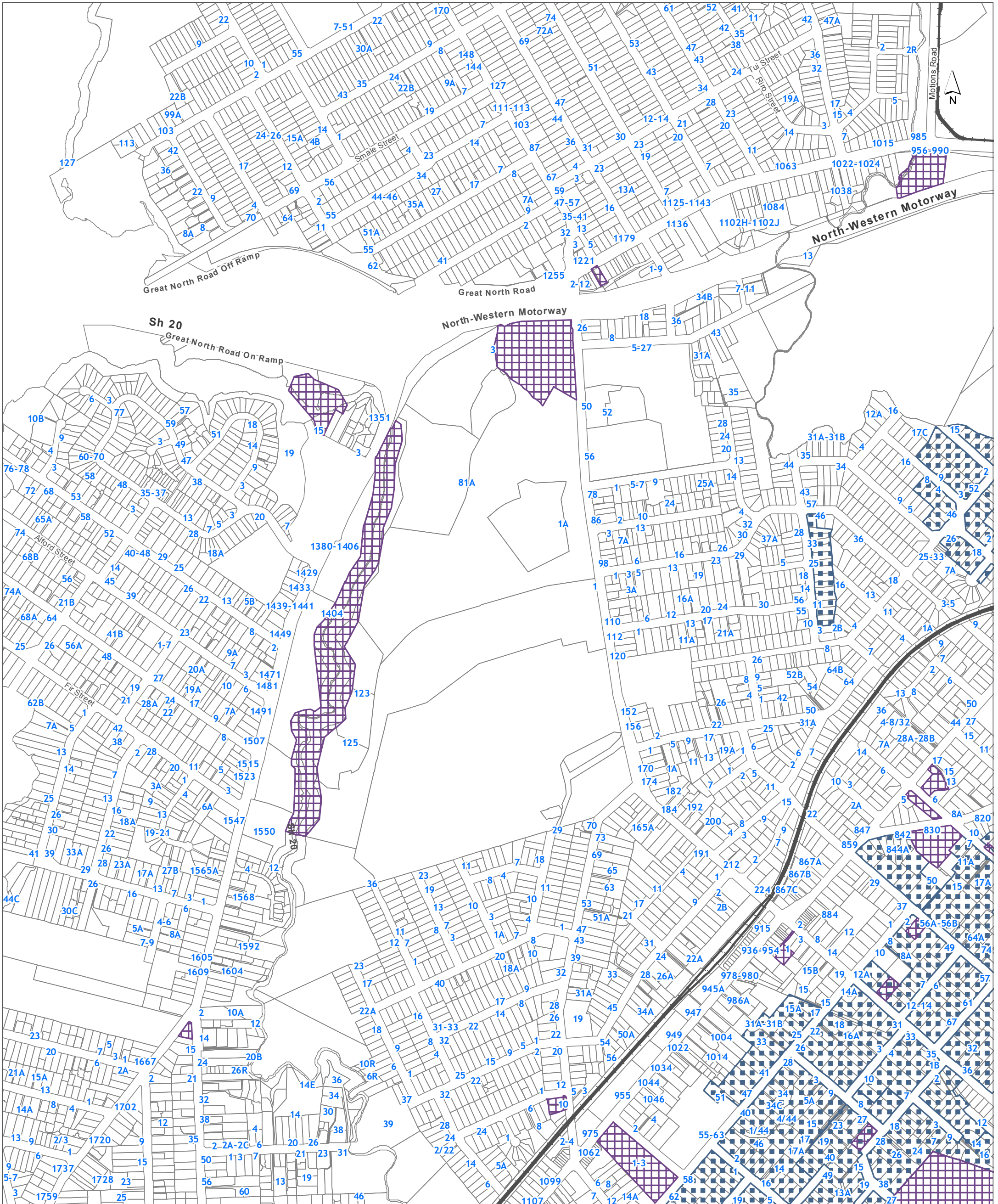
DATE: 29 APRIL 2021 DRAWN: PJ CHECKED: SM SCALE (A3) 1:4,000

**PROPOSED UPGRADES TO THE
STORMWATER NETWORK**

FIGURE 8.1

While every care is taken by MPS Limited to ensure the accuracy of the digital data, MPS Limited makes no representation or warranties about its accuracy, reliability, completeness, suitability for any particular purpose and disclaims all responsibility and liability (including without limitation, liability in negligence) for any expenses, losses, damages (including indirect or consequential damage) and costs which may be incurred as a result of data being inaccurate in any way for any reason. Electronic files are provided for information only. The data in these files is not controlled or subject to automatic updates for users outside of MPS Limited.

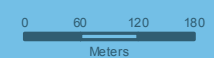
APPENDIX 2: AUCKLAND UNITARY PLAN MAPS



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Built Heritage and Character

Unitec



Scale @ A3

= 1:8,000

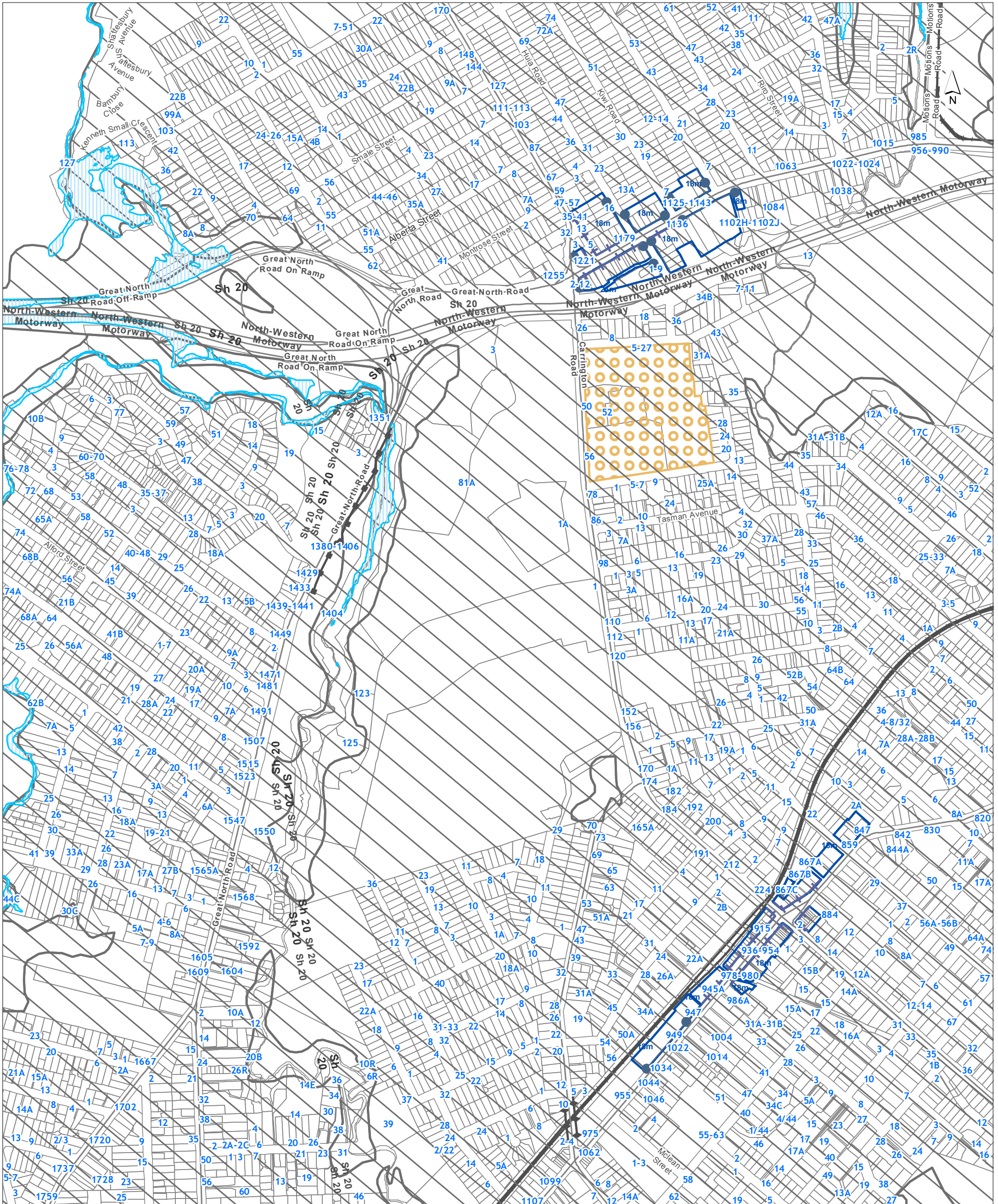
Date Printed:

25/10/2017



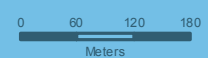
Auckland Council

Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Controls
Unitec



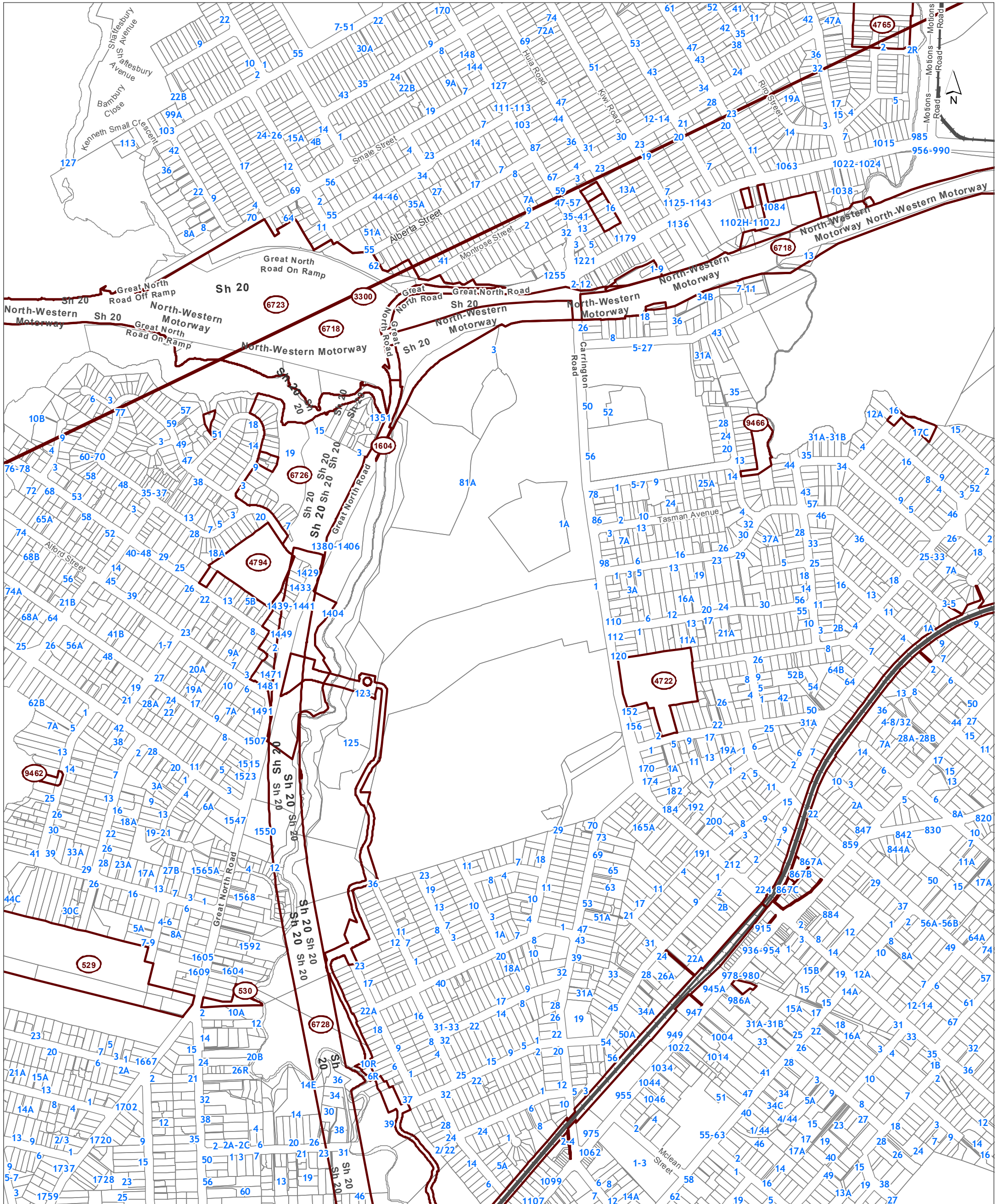
Scale @ A3
 = 1:8,000

Date Printed:
 25/10/2017



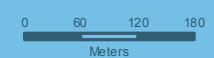
Auckland Council

Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Designations
Unitec

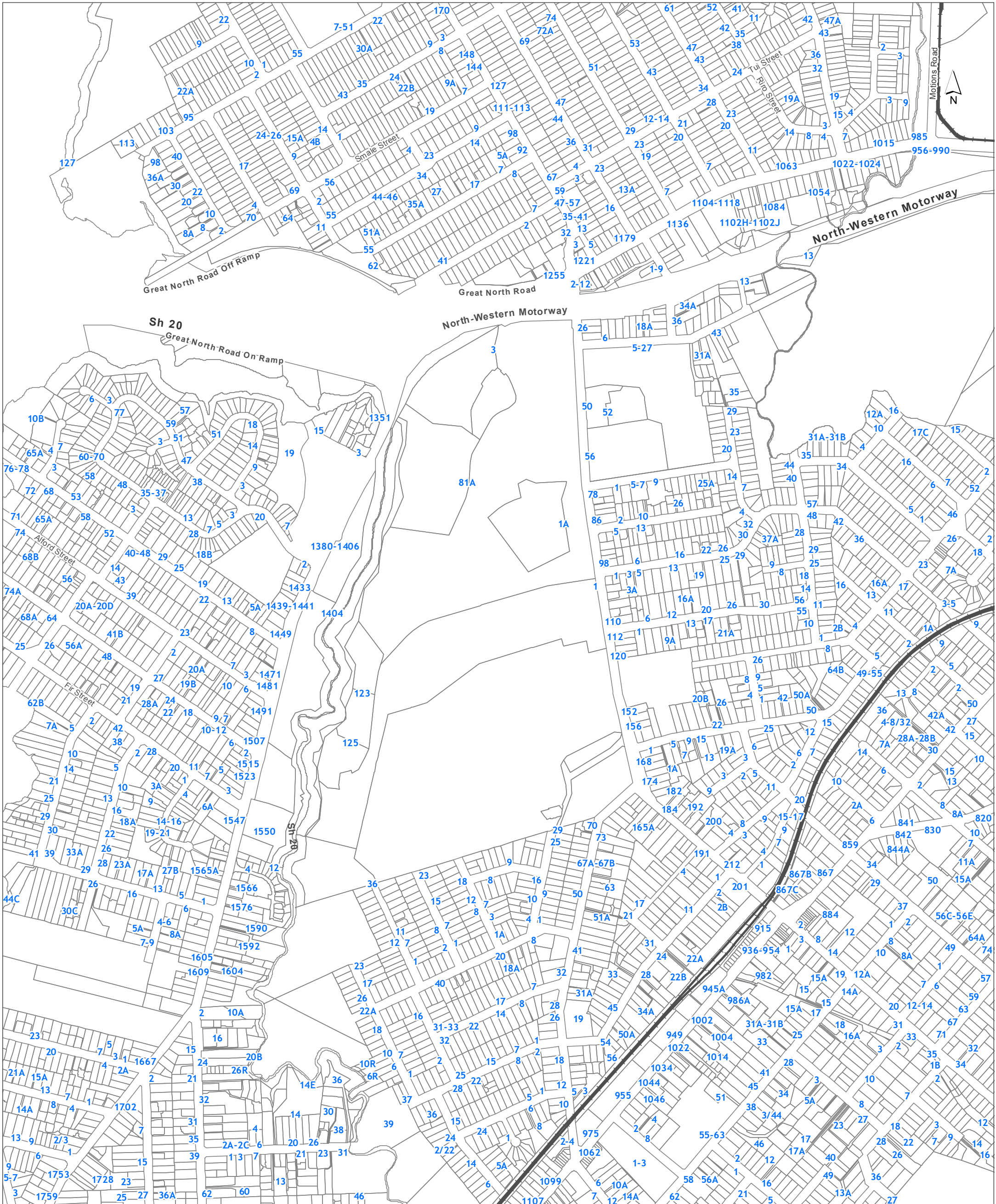


Scale @ A3
= 1:8,000

Date Printed:
25/10/2017



Auckland Council
Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Infrastructure
 Unitec

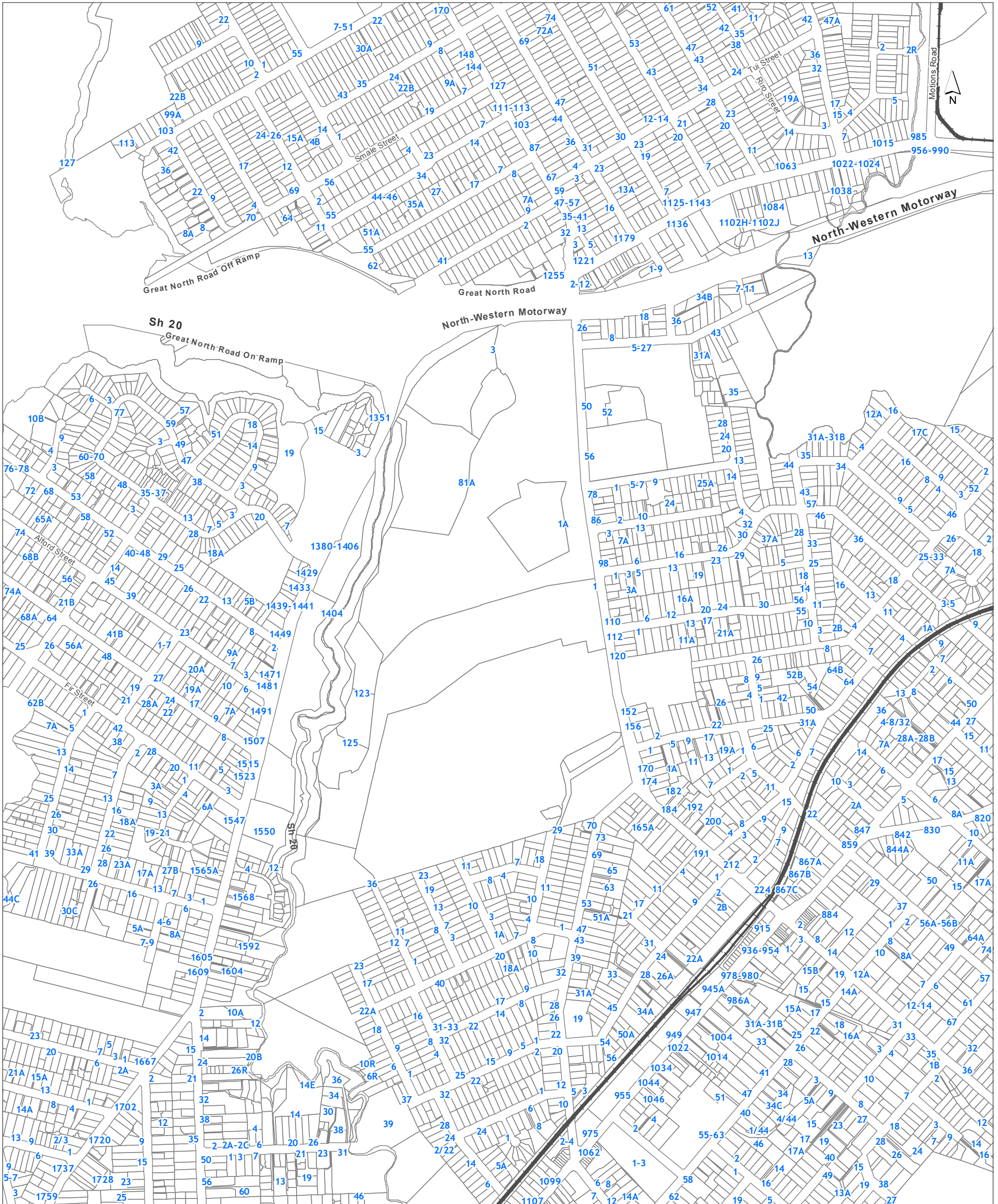


Scale @ A3
 = 1:8,000

Date Printed:
 25/10/2017



Auckland Council
 Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Mana Whenua
Unitec

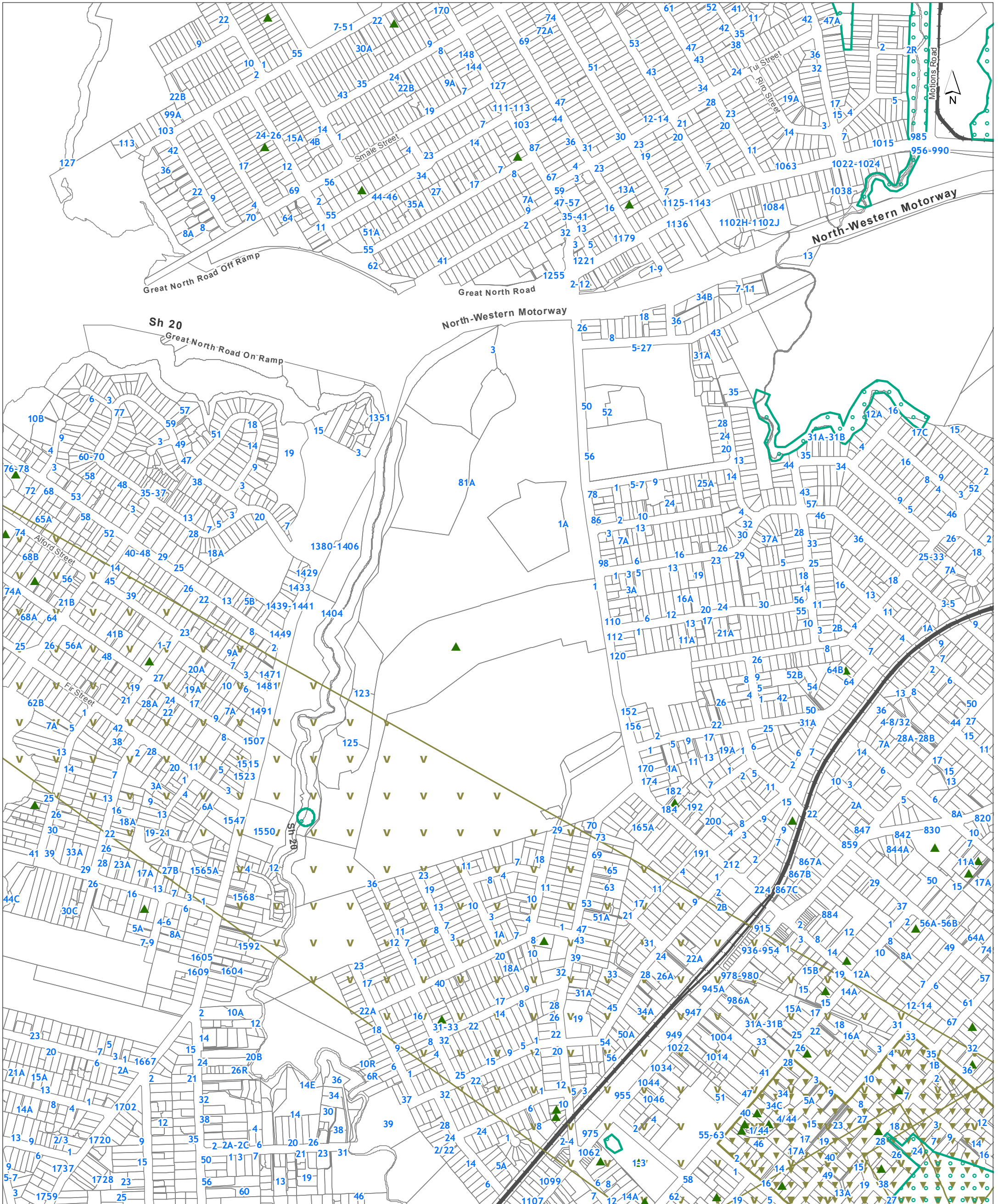


Scale @ A3
= 1:8,000

Date Printed:
25/10/2017

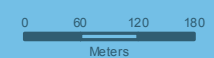


Auckland Council
Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Natural Heritage
 Unitec

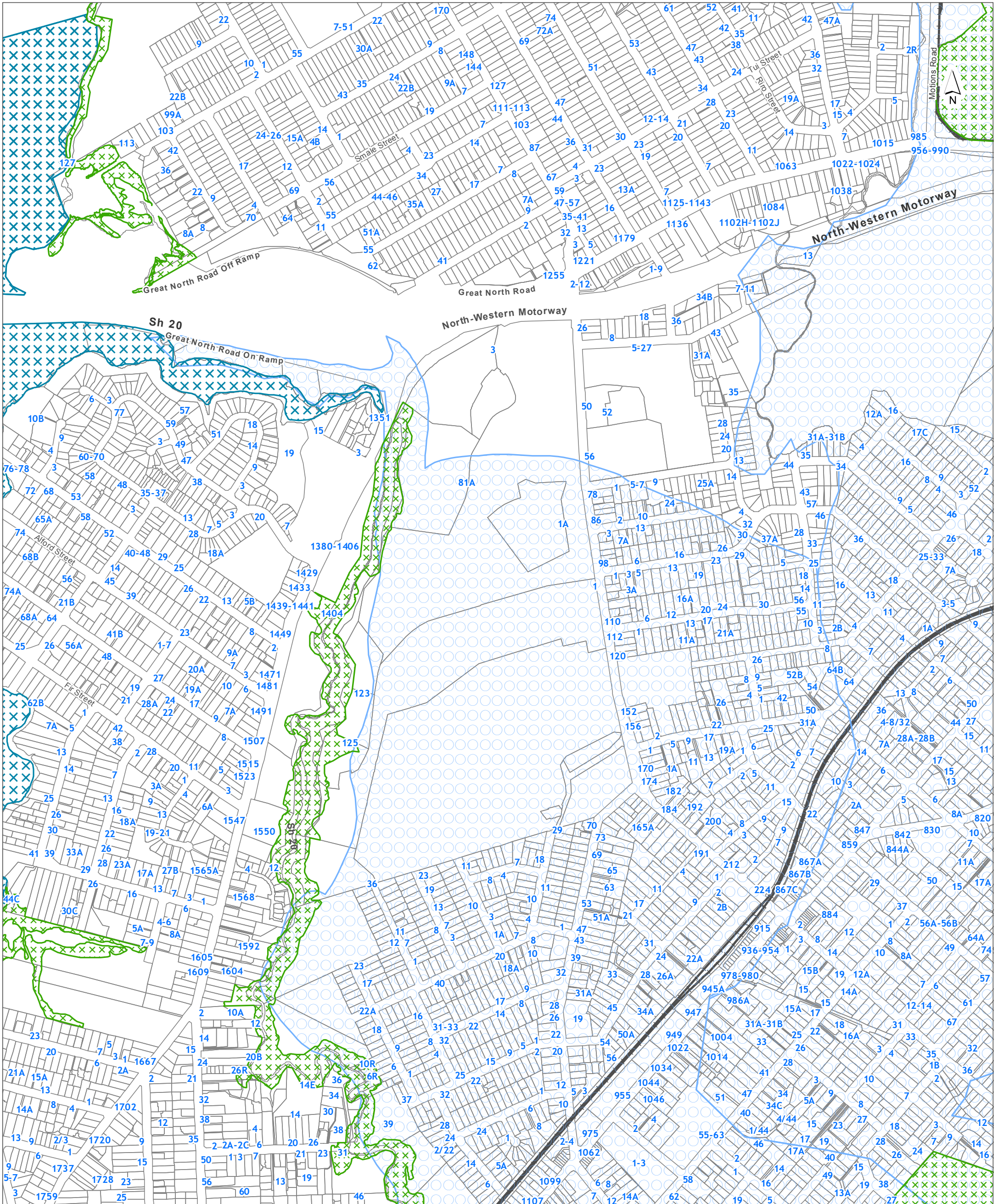


Scale @ A3
 = 1:8,000

Date Printed:
 25/10/2017



Auckland Council
 Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Natural Resources
 Unitec

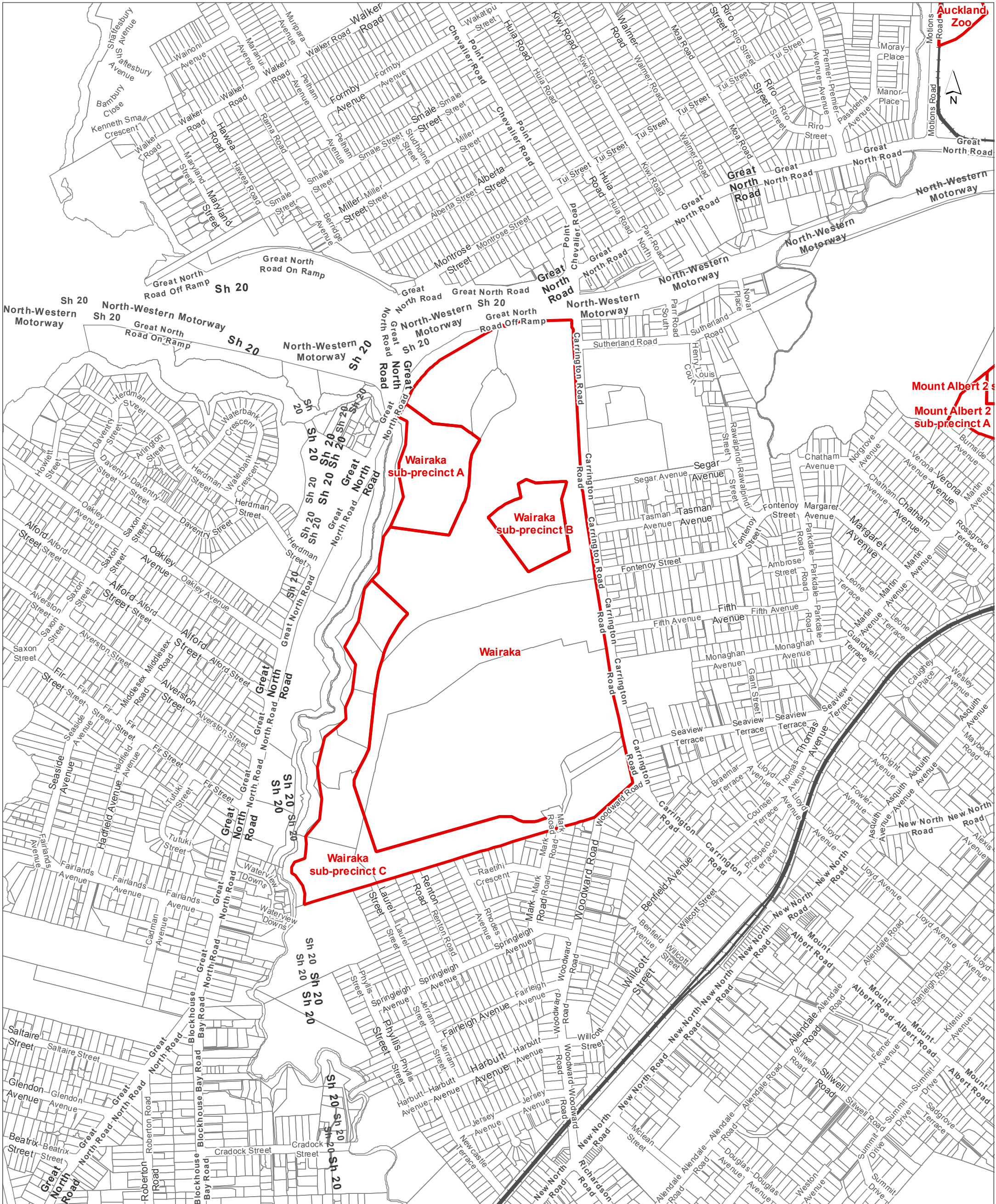


Scale @ A3
 = 1:8,000

Date Printed:
 25/10/2017



Auckland Council
 Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Precincts
 Unitec



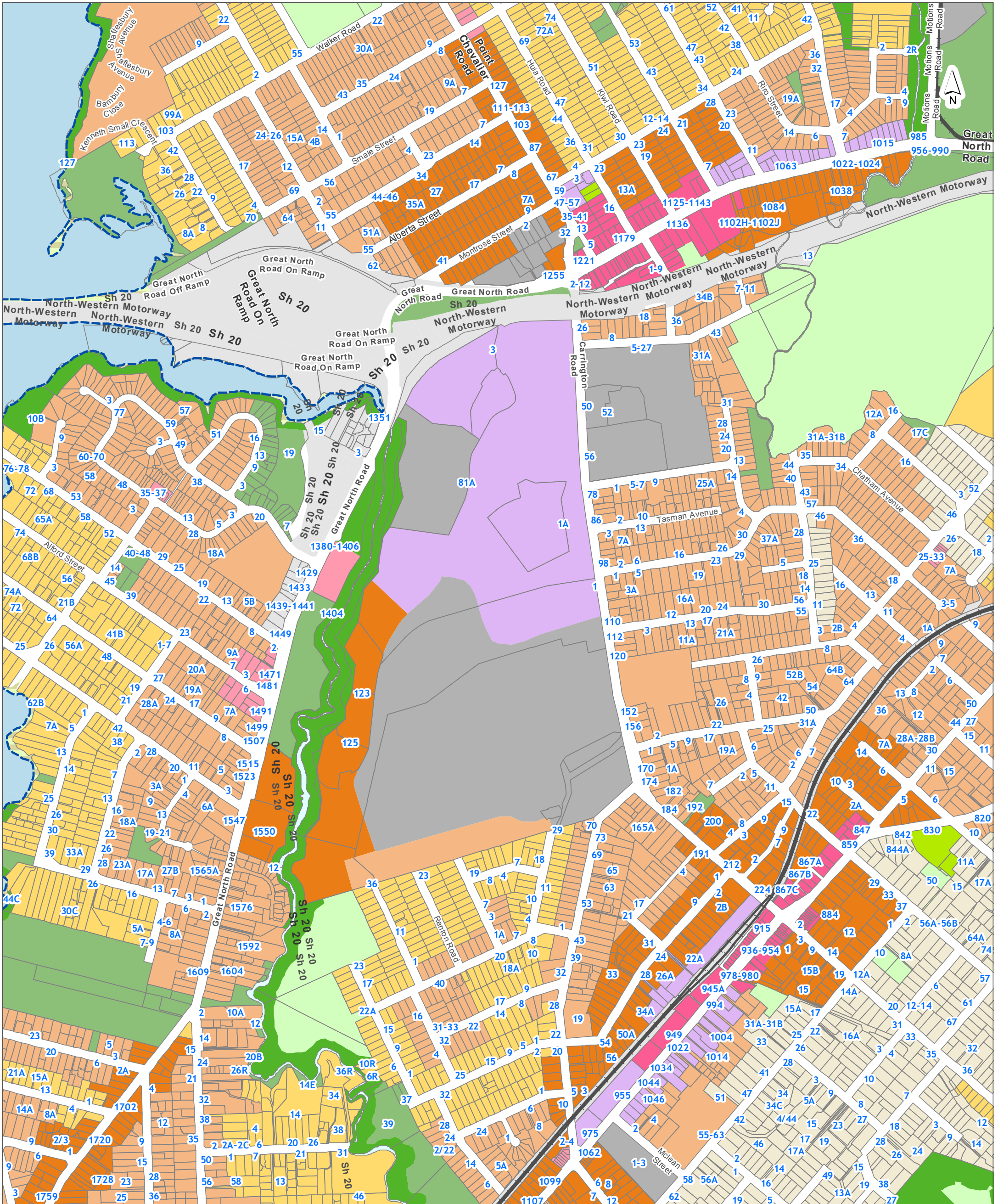
Scale @ A3
 = 1:8,000

Date Printed:
 25/10/2017



Auckland Council

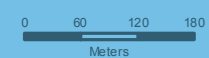
Te Kaunihera o Tāmaki Makaurau



DISCLAIMER:
 This map/plan is illustrative only and all information should be independently verified on site before taking any action. Copyright Auckland Council. Land Parcel Boundary information from LINZ (Crown Copyright Reserved). Whilst due care has been taken, Auckland Council gives no warranty as to the accuracy and plan completeness of any information on this map/plan and accepts no liability for any error, omission or use of the information. Height datum: Auckland 1946.

Zones and Rural Urban Boundary

Unitec



Scale @ A3

= 1:8,000

Date Printed:

25/10/2017



Auckland Council

Te Kaunihera o Tāmaki Makaurau

Auckland Unitary Plan Operative in part 15th November 2016 - LEGEND

Appeals

- Properties affected by Appeals seeking change to zones or management layers
- Properties affected by Appeals seeking reinstatement of management layers

Plan Modifications

- Notice of Requirements
- Plan Changes

ZONES	
	Residential - Large Lot Zone
	Residential - Rural and Coastal Settlement Zone
	Residential - Single House Zone
	Residential - Mixed Housing Suburban Zone
	Residential - Mixed Housing Urban Zone
	Residential - Terrace Housing and Apartment Buildings Zone
	Business - City Centre Zone
	Business - Metropolitan Centre Zone
	Business - Town Centre Zone
	Business - Local Centre Zone
	Business - Neighbourhood Centre Zone
	Business - Mixed Use Zone
	Business - General Business Zone
	Business - Business Park Zone
	Business - Heavy Industry Zone
	Business - Light Industry Zone
	Open Space - Conservation Zone
	Open Space - Informal Recreation Zone
	Open Space - Sport and Active Recreation Zone
	Open Space - Civic Spaces Zone
	Open Space - Community Zone

ZONES		Tagging of Provisions:
	Rural - Rural Production Zone	[i] = Information only
	Rural - Mixed Rural Zone	[rp] = Regional Plan
	Rural - Rural Coastal Zone	[rcp] = Regional Coastal Plan
	Rural - Rural Conservation Zone	[rps] = Regional Policy Statement
	Rural - Countryside Living Zone	[dp] = District Plan (only noted when dual provisions apply)
	Rural - Waitakere Foothills Zone	
	Rural - Waitakere Ranges Zone	
	Future Urban Zone	
	Green Infrastructure Corridor (Operative in some Special Housing Areas)	
	Coastal - General Coastal Marine Zone [rcp]	
	Coastal - Marina Zone [rcp/dp]	
	Coastal - Mooring Zone [rcp]	
	Coastal - Minor Port Zone [rcp/dp]	
	Coastal - Ferry Terminal Zone [rcp/dp]	
	Coastal - Defence Zone [rcp]	
	Coastal - Coastal Transition Zone	
	Special Purpose Zone - Airports & Airfields, Cemetery, Quarry, Healthcare Facility & Hospital, Tertiary Education, Maori Purpose, Major Recreation Facility, School	
	Strategic Transport Corridor Zone	
	Water [i]	

DESIGNATIONS

- Designations
- Airspace Restriction Designations

OVERLAYS		Natural Resources
	Terrestrial [rp/dp]	Significant Ecological Areas Overlay
	Marine 1 [rcp]	
	Marine 2 [rcp]	
	Natural	Lake Management Areas Overlay (Natural Lake and Urban Lake)
	Urban	
	Water Supply Management Areas Overlay [rp]	
	Natural Stream Management Areas Overlay [rp]	
	High-Use Stream Management Areas Overlay [rp]	
	High-Use Aquifer Management Areas Overlay [rp]	
	Quality-Sensitive Aquifer Management Areas Overlay [rp]	
	Wetland Management Areas Overlay [rp]	
	Airport Approach Surface Overlay	Infrastructure
	Aircraft Noise Overlay	
	City Centre Port Noise Overlay [rcp / dp]	
	Quarry Buffer Area Overlay	
	Uncompromised	National Grid Corridor Overlay
	Compromised	
	National Grid Corridor	
	Sites & Places of Significance to Mana Whenua Overlay [rcp/dp]	Mana Whenua

- Precincts
- Indicative Coastline [i]
- Rural Urban Boundary

OVERLAYS		Natural Heritage
	Notable Trees Overlay	Waitakere Ranges Heritage Area Overlay
	Outstanding Natural Features Overlay [rcp/dp]	
	Outstanding Natural Landscapes Overlay [rcp/dp]	
	Outstanding Natural Character Overlay [rcp/dp]	
	High Natural Character Overlay [rcp/dp]	
	Local Public Views Overlay [rcp/dp]	
	Viewshafts	Regionally Significant Volcanic Viewshafts & Height Sensitive Areas Overlay [rcp/dp]
	Height Sensitive Areas	
	Regionally Significant Volcanic Viewshafts Overlay Contours [i]	
	Locally Significant Volcanic Viewshafts Overlay [rcp/dp]	
	Locally Significant Volcanic Viewshafts Overlay Contours [i]	
	Extent of Overlay	Waitakere Ranges Heritage Area Overlay
	Subdivision Schedule	
	Modified	Ridgeline Protection Overlay
	Natural	

CONTROLS		
	Key Retail Frontage	Building Frontage Control
	General Commercial Frontage	
	Adjacent to Level Crossings	Vehicle Access Restriction Control
	General	
	Motorway Interchange Control	
	Coastal Inundation 1 per cent AEP Plus 1m Control	
	Business Park Zone Office Control	
	Cable Protection Areas Control [rcp]	
	Centre Fringe Office Control	
	Height Variation Control	
	Arterial Roads	

OVERLAYS		Built Heritage & Character
	Historic Heritage Overlay Place [rcp/dp]	Built Heritage & Character
	Historic Heritage Overlay Extent of Place [rcp/dp]	
	Special Character Areas Overlay Residential and Business	
	Auckland War Memorial Museum Viewshaft Overlay [rcp/dp]	
	Auckland War Memorial Museum Viewshaft Overlay Contours [rcp/dp]	
	Dilworth Terrace Houses Viewshaft Overlay	
	Dilworth Terrace Houses Viewshaft Overlay Contours	
	Identified Growth Corridor Overlay	Built Environment

CONTROLS		
	Hazardous Facilities	Emergency Management Area Control
	Infrastructure	
	Flow 1 [rp]	Stormwater Management Area Control
	Flow 2 [rp]	
	Level Crossings With Sightlines Control	
	Macroinvertebrate Community Index	
	Parking Variation Control	
	Subdivision Variation Control	
	Surf Breaks [rcp]	

Auckland Unitary Plan Operative in part (15th November 2016) Property Summary Report

Address

Null

Legal Description

Hydro

Appeals

Modifications

Zones

Coastal - Coastal Transition Zone

Coastal - General Coastal Marine Zone

Open Space - Conservation Zone

Precinct

Controls

Controls: Arterial Roads

Controls: Coastal Inundation 1 per cent AEP Plus 1m Control - 1m sea level rise

Controls: Macroinvertebrate Community Index - Native

Controls: Macroinvertebrate Community Index - Urban

Overlays

Natural Heritage: Outstanding Natural Features Overlay [rcp/dp] - ID 161, Pollen And Traherne Islands and mudflats

Natural Heritage: Regionally Significant Volcanic Viewshafts And Height Sensitive Areas Overlay [rcp/dp] - A13, Mount Albert, Viewshafts

Natural Resources: Significant Ecological Areas Overlay - SEA-M1-53, Marine 1

Natural Resources: Significant Ecological Areas Overlay - SEA-M1-53w2, Significant wading bird area, Marine 1

Natural Resources: Significant Ecological Areas Overlay - SEA_T_3161, Terrestrial

Natural Resources: Significant Ecological Areas Overlay - SEA_T_6009, Terrestrial

Natural Resources: Significant Ecological Areas Overlay - SEA_T_6190, Terrestrial

Designations

Designations: Designations - 3300, Broadcasting and telecommunications facility, Designations, Kordia Ltd

Designations: Designations - 6718, State Highway 1: To undertake maintenance, operation, use and improvement to the State Highway network., Designations, New Zealand Transport Agency

Designations: Designations - 6722, Motorway: Western Ring Route - Waterview Connection Alteration to Designation A07-01 State Highway 16 Along the Causeway and Rosebank Peninsula: To undertake maintenance, operation, use and improvement to the State Highway network., Designations, New Zealand Transport Agency

Designations: Designations - 6724, State Highway 16: To undertake maintenance, operation, use and improvement to the State Highway network., Designations, New Zealand Transport Agency

Private bag 92300, Victoria Street
Auckland 1142
09 301 0101
www.aucklandcouncil.govt.nz



Auckland Unitary Plan Operative in part (15th November 2016) Property Summary Report

Continued

APPENDIX 3: SMP CHECKLIST

DOES THIS SITE HAVE AN EXISTING SMP/CMP/ICMP?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Yes, Oakley Catchment Management Plan but this is out of date and does not reflect the proposed changes from development
DOES THIS SITE HAVE AN EXISTING NDC OR CURRENTLY UNDER REVIEW NDC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Council's Oakley Network Discharge Consent (Consent Number 24973) Regionwide NDC
IS THE SITE WITHIN AN IDENTIFIED PRECINCT (AUCKLAND UNITARY PLAN) OR STRUCTURE PLAN?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Wairaka Precinct (AUP I3334)
WHICH SMAF ZONE IS THE SITE IN?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>	
ARE THERE ANY HIGH CONTAMINANT GENERATING ACTIVITIES PROPOSED IN YOUR SITE?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Taylor's Laundry and Carparking areas
DOES THE SITE CONTAIN OR SIT ADJACENT TO ANY STREAMS?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Wairaka Stream runs through the site Site sits adjacent to Te Auaunga/ Oakley Creek
DOES THE SITE CONTAIN ANY OVERLAND FLOW PATHS?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Yes, see Appendix 1
IS THERE CAPACITY IN DOWNSTREAM STORMWATER PRIMARY NETWORK? (PIPE OR CHANNEL)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	Te Auaunga/ Oakley Creek is the receiving environment and has sufficient capacity
IS THERE ANY DOWNSTREAM FLOOD RISK OR EVIDENCE OF PAST FLOODING?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not yet known <input type="checkbox"/>	No, Te Auaunga/ Oakley Creek discharges into the Waitemata Harbour
ANY SIGNIFICANT ECOLOGICAL AREAS WITHIN OR ADJACENT TO YOUR SITE?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Not yet known <input type="checkbox"/>	Downstream is a Significant Ecological Area - Marine 1 - Significant wading bird area
ANY SIGNIFICANT AREAS OF VEGETATION WITHIN OR ADJACENT TO YOUR SITE?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	There are significant trees spread across the site. A list and map of the locations can be found in the report.
ANY AREAS OF SOIL CONTAMINATION WITHIN OR ADJACENT TO YOUR SITE?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	The precinct is a HAIL site.

IS YOUR SITE WITHIN AN AQUIFER PROTECTION AREA?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not yet known <input type="checkbox"/>	The stormwater system does not include any soakage and therefore will not impact the aquifer negatively. Any devices which promote groundwater recharge will provide treatment.
WHAT IS YOUR TOTAL SITE AREA?	Less than 1000m ² <input type="checkbox"/>	Between 1000 and 5000m ² <input type="checkbox"/>	More than 5000m ² <input checked="" type="checkbox"/>	The site is located in the Te Auaunga/ Oakley Creek catchment. A southern catchment contributes to the Wairaka Precinct stormwater runoff.