

# Central Interceptor Scheme



## Central Interceptor Main Project Works Resource Consent Applications and Assessment of Effects on the Environment

Part A – AEE Report

## Quality Information

Document Central Interceptor Project  
Assessment of Effects on the Environment

- Part A: AEE Report
- Part B: Site Specific Assessments
- Part C: Drawing Set
- Part D: Technical Reports

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## Glossary of terms

Term	Definition
Central Interceptor scheme	Comprises the main tunnel and link sewers and connections to existing reticulation and associated works as well as the CSO Collector Sewers.
Combined Sewer Overflow	The discharge of wastewater and stormwater from a combined sewer system. Typically outfalls to watercourses or marine environment.
dB	Decibel – A measurement of sound level expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$ .
dBA	A measurement of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
Decanting Earth Bund (DEB)	A temporary berm or ridge of compacted soil (including topsoil) constructed to create impoundment areas where ponding of runoff can occur and suspended material can settle before runoff is discharged.
Gasket	A mechanical seal which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects.
$L_{Aeq(t)}$	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level. The suffix "t" represents the time period to which the noise level relates.
Rising main	From the pump station to the Mangere WWTP the sewer is pressurised by pumping and is termed a rising main.
Siphon (Manukau Siphon)	Siphons (inverted siphons) allow stormwater or wastewater sewers to pass under obstructions such as rivers and harbours. The siphon flows under pressure without pumping. The section of sewer passing beneath the Manukau Harbour is termed the Manukau Siphon.
Tunnel invert	Refers to the bottom of the internal cross section of the tunnel.

## Glossary of abbreviations

Abbreviation	Definition
AC	Auckland Council
ACM	Asbestos containing material
AEE	Assessment of Effects on the Environment
ARP: ALW	Auckland Council Regional Plan: Air, Land and Water
ARPS	Auckland Council Regional Policy Statement
ARP: SC	Auckland Council Regional Plan: Sediment Control
ARP: C	Auckland Council Regional Plan: Coastal
ATF	Air Treatment Facility
Auckland City District Plan	Auckland Council District Plan (Auckland City Isthmus Section)
CAR	Corridor Access Request
CBD	Central Business District
CMA	Coastal Marine Area
CMP	Construction management plan
CNMP	Construction noise management plan
CPA	Coastal Protection Area
CPTED	Crime Prevention Through Environmental Design
CSO	Combined Sewer Overflow
CTMP	Construction traffic management plan
DEB	Decanting Earth Bund
ECBF	East Coast Bays Formation
EPB	Earth Pressure Balance
ESCP	Erosion and Sediment Control Plan
ID	Internal diameter
LS1	Link Sewer 1: Motions Road to Western Springs
LS2	Link Sewer 2: Norgrove Avenue to Mount Albert War Memorial Reserve
LS3	Link Sewer 3: PS 25 (Miranda Reserve) to May Road
LS4	Link Sewer 4: Kiwi Esplanade to Witla Court

<b>Abbreviation</b>	<b>Definition</b>
Manukau District Plan	Auckland Council District Plan (Manukau Section)
MCA	Multi Criteria Analysis
MOTAT	Museum of Transport and Technology
MT1	Main tunnel section 1: Western Springs to May Road
MT2	Main tunnel section 2: May Road to Mangere Pump Station
MTBM	Micro Tunnel Boring Machine
NES	National Environmental Standard
NoR	Notice of Requirement
OPW	Outline Plan of Works
PAH	Polycyclic aromatic hydrocarbon
PS	Pump Station
PSR	(Auckland Council) Parks, Sports and Recreation
RL	Reduced Level
RMA	Resource Management Act 1991
SH 16	State Highway 16
SH 20	State Highway 20
SMP	Site Management Plan / Remedial Action Plan
SVOC	Semi-volatile organic compound
TBM	Tunnel Boring Machine
TPH	Total petroleum hydrocarbon
UV	Ultraviolet
Watercare	Watercare Services Ltd
WWTP	Wastewater Treatment Plant

## Site list

	Shaft No.	Classification	Drawing reference	Map reference (NZTM)
<b>Main Tunnel</b>				
Western Springs and Western Springs CSO Collector	WS 1	Primary	AEE-Main-1.1 AEE-Main-1.2 AEE-Main-1.3 AEE-Main-1.4	1754137 E 5918670 N 1754099 E 5918380 N
Mount Albert War Memorial Reserve	AS 1 L2S3	Secondary	AEE-Main-2.1 AEE-Main-2.2	1753661 E 5917239 N
Lyon Avenue	AS 2	Secondary	AEE-Main-3.1 AEE-Main-3.2	1754144 E 5916606 N
Haverstock Road	AS 3	Secondary	AEE-Main-4.1 AEE-Main-4.2	1754008 E 5915915 N
Walmsley Park	AS 4	Secondary	AEE-Main-5.1 AEE-Main-5.2	1754217 E 5914839 N
May Road	WS 2	Primary	AEE-Main-6.1 AEE-Main-6.2	1754035 E 5913715 N
Keith Hay Park	AS 5	Secondary	AEE-Main-7.1 AEE-Main-7.2	1755314 E 5912784 N
Pump Station 23 (Frederick Street)	AS 6	Secondary	AEE-Main-8.1 AEE-Main-8.2	1756873 E 5911867 N CMA: 1756867 E 5911849 N
Kiwi Esplanade	AS 7	Secondary	AEE-Main-9.1A AEE-Main-9.2A	1757160 E 5910270 N
Mangere Pump Station	WS 3	Primary	AEE-Main-10.1 AEE-Main-10.2	1758272 E 5908088 N CMA: 1758115 E 5908063 N
<b>Link Sewers</b>				
Motions Road	L1S1	Secondary	AEE-Main-11.1 AEE-Main-11.2	1753206 E 5918817 N
Western Springs Depot	L1S2	Secondary	AEE-Main-12.1 AEE-Main-12.2	1753742 E 5918751 N
Rawalpindi Reserve	L2S1	Secondary	AEE-Main-13.1 AEE-Main-13.2	1752821 E 5917733 N

	<b>Shaft No.</b>	<b>Classification</b>	<b>Drawing reference</b>	<b>Map reference (NZTM)</b>
Norgrove Avenue	L2S2	Secondary	AEE-Main-14.1 AEE-Main-14.2	1753145 E 5917768 N
Pump Station 25 (Miranda Reserve)	L3S1	Secondary	AEE-Main-15.1 AEE-Main-15.2	1751264 E 5913681 N
Miranda Reserve	L3S2	Secondary	AEE-Main-16.1 AEE-Main-16.2	1751582 E 5913621 N
Whitney Street	L3S3	Secondary	AEE-Main-17.1 AEE-Main-17.2	1752195 E 5913597 N
Dundale Avenue	L3S4	Secondary	AEE-Main-18.1 AEE-Main-18.2	1752722 E 5913379 N
Haycock Avenue	L3S5	Secondary	AEE-Main-19.1 AEE-Main-19.2	1753364 E 5913037 N



## Executive Summary

Watercare Services Limited (Watercare) is proposing to construct a wastewater interceptor (the “Central Interceptor”) to collect, store, and convey wastewater to the Mangere Wastewater Treatment Plant (Mangere WWTP). This Assessment of Effects on the Environment (AEE) report has been prepared to support Notices of Requirement (NoR) and resource consent applications for the construction, operation and maintenance of the wastewater interceptor and all other associated tunnels, pipes, structures and activities.

Watercare, Auckland Council and predecessor organisations, have spent many years evaluating network upgrading options that provide for network capacity and asset risk management, and reduce the environmental effects of network overflow discharges. The key challenge has been achieving an integrated network solution at a cost that is affordable to the community.

In 2008 Watercare completed the Three Waters Strategic Plan a four year planning exercise addressing the water, wastewater and stormwater needs for the Auckland Region. The Three Waters Strategic Plan identified that Auckland’s most immediate wastewater need was upgrading of the sewer network in the Auckland Isthmus. The Plan highlighted the needs for the wastewater network as being:

- Providing additional network capacity for growth and development across the Auckland Isthmus;
- Duplicating the lower section of the regionally critical Western Interceptor, particularly the Hillsborough Tunnel and Manukau Siphon which are ageing and at risk of failure; and
- Reducing existing wastewater overflows from the old combined sewer system into urban streams and the Waitemata Harbour, improving public health and environmental conditions.

The Central Interceptor scheme has been developed by Watercare as the Best Practicable Option (BPO) for addressing these needs. The options analysis confirms that the Central Interceptor represents the most cost effective solution for delivering the required wastewater network improvements.

The overall concept of the Central Interceptor is a 13 km gravity tunnel with three sewer tunnels extending from the main tunnel westward, a series of connections to the existing trunk sewer network to pick up wastewater flow, and a new pump station at Mangere WWTP (the “main project works”). In addition to these works, the overall Central Interceptor scheme involves a series of smaller sewers that extend into the local network to connect to network overflow locations (the “Combined Sewer Overflow (CSO) Collector Sewers”). This AEE report describes the Central Interceptor main project works. The CSO Collector Sewers are addressed in a separate report.

The project has been developed to a concept design stage and it is likely that some design and construction details will change as the project is optimised in the detailed design and construction stages. While the layouts and dimensions provided in the AEE and drawings are approximate, the designs represent an appropriate basis for assessing the potential effects arising from construction, operation and maintenance of the main project works.

While the construction of the Central Interceptor tunnels will occur largely below ground, sites are required at the surface along the tunnel alignment to construct the tunnels and provide permanent facilities associated with connections to the network and for ongoing operations and maintenance. The proposed works are within the jurisdiction of Auckland Council. Watercare is lodging two NoRs to designate a number of sites across the Auckland Isthmus and Mangere Bridge in the Auckland Council District Plan (Auckland City Isthmus Section) and the Auckland Council District Plan (Manukau Section). A suite of resource consents are also sought. Separate applications are being lodged for the CSO Collector Sewers as these are a later works package within the local networks.

The Central Interceptor main project works will have important positive effects by:

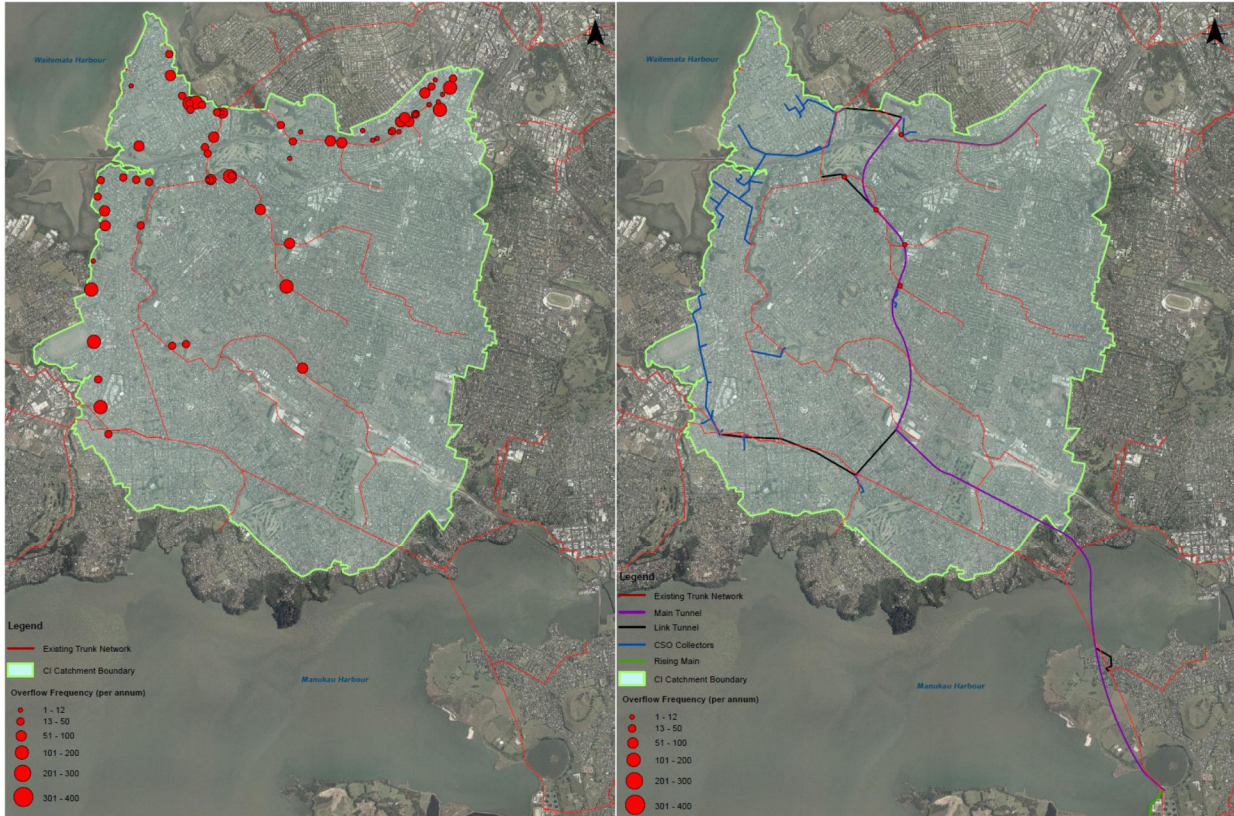
- Providing additional sewer network capacity for growth and development;
- Providing asset security by duplicating the lower section of the ageing Western Interceptor;
- Significantly reducing the major wastewater overflows into the Meola Creek catchment; and
- Providing the opportunity to further reduce existing wastewater overflows from the combined sewer system into urban streams and the Waitemata Harbour.

With respect to overflow reduction effects, reductions achieved by the main project works will provide the following environmental benefits, particularly to Meola Creek:

- **Public health** - The significant reduction in wastewater overflows will reduce potentially harmful pathogens reaching the Meola Creek and Meola Creek estuary and associated coastal waters.
- **Ecological values** - The significant reduction in network overflow discharges will result in a range of ecological benefits in Meola Creek and Meola Creek estuary. These will include reduced nutrient and organic loads, improvements in water quality, and reduction in the likelihood of conditions that cause ecological stress and adverse ecological change.
- **Amenity values** - Watercare's two largest network overflows discharge to the head of Meola Creek, adjacent to Mount Albert Grammar School and the Roy Clements Treeway walkway. Other significant overflows occur further downstream. These overflows adversely affect the amenity values of these public areas, reducing aesthetic and recreational values. The main project works will significantly reduce the level of overflow to the Meola Creek, and will enhance amenity values.
- **Cultural values** - Watercare recognises the importance of land and water resources to tangata whenua. The proposed Central Interceptor main project works will result in a significant reduction in the volume and frequency of network overflows and will significantly reduce the volume of wastewater contaminants reaching Meola Creek and the associated degradation of this waterway. The works will greatly assist in the restoration of the mauri of this waterway and associated coastal waters.

The Central Interceptor main works also enables the construction of the CSO Collector Sewers which in turn generate public health, amenity, and ecological benefits for Whau, Oakley, and Motions Creeks.

The figures below graphically indicate the level of wastewater overflow reduction achieved by the Central Interceptor scheme. The figures depict the frequency of overflows in the year 2030 both without (left hand figure) and with (right hand figure) the Central Interceptor scheme, where the red dots indicate overflow frequency at overflow locations in an average year of rainfall.



**Overflow frequency 2030 – without Central Interceptor**

**Overflow frequency 2030 – with Central Interceptor**

The tunnels are not expected to affect properties above the alignment or archaeological or geological features and there is negligible risk of damage to buildings and services due to tunnel excavation and operation. Adverse effects on groundwater users and on groundwater quality are not expected. The main tunnel will pass under the seabed of the Manukau Harbour, but will be at depth and any effects in the CMA will be negligible.

During the construction works there will be a range of adverse effects within the immediate vicinity of the works areas. These will generally be of a temporary and no more than minor nature and/or can be mitigated with appropriate construction management. Once completed, the Central Interceptor and associated features will be predominantly underground, and temporary work areas will be reinstated in an appropriate manner. The ongoing effects of the permanent works are not expected to be more than minor.

Where possible, adverse effects have been avoided or minimised through the design development process, by considering alternative site locations and layouts. Where adverse effects cannot be avoided or minimised through alternative sites, those effects will be remedied or mitigated.

Overall, the project fulfils the intent and purpose of the RMA in that it will provide regionally important infrastructure essential for the wellbeing of the community. The works will promote the sustainable management of natural and physical resources by improving the bulk wastewater network and enabling people and communities of the region to provide for their social, economic and cultural wellbeing and for their health and safety. The works give effect to or are generally consistent with the relevant objectives and policies set out in the relevant statutory documents.

## 1.0 Introduction and project overview

### 1.1 Introduction

Watercare Services Limited (Watercare) is the water and wastewater service provider for Auckland. Watercare is proposing to construct a new wastewater interceptor underground within the Auckland Isthmus to collect, store, and convey wastewater to the Mangere Wastewater Treatment Plant (WWTP). This new interceptor is called the Central Interceptor.

The process to identify a solution for the future needs of Auckland's ageing wastewater infrastructure commenced in 2004 through the Three Waters Strategic Plan (Watercare, 2008). The Central Interceptor was identified as the preferred solution that would:

- Provide additional sewer network capacity for growth and development across the Auckland Isthmus;
- Duplicate the lower section of the regionally critical Western Interceptor, particularly the Hillsborough Tunnel and Manukau Siphon which are ageing and at risk of failure; and
- Reduce existing wastewater overflows from the old combined sewer system into urban streams and the Waitemata Harbour, improving public health and environmental conditions.

The Central Interceptor comprises a tunnelled wastewater interceptor extending from Western Springs to the Mangere WWTP, with connections to Watercare's existing wastewater network which divert flow into the new interceptor. The location of the Central Interceptor and the Watercare wastewater network serviced by it are shown in Figure 1-1 at the end of this section.

The overall concept for the Central Interceptor scheme has two elements:

- The **“main project works”**, which comprise a 13 km gravity tunnel from Western Springs to the Mangere WWTP, four link sewers extending from the main tunnel, a series of connections to the existing Watercare wastewater network, and a new pumping station at the WWTP to pump wastewater from the tunnel to the plant. These works will provide the network capacity required for future growth on the Auckland Isthmus, will duplicate the lower section of the Western Interceptor, and will provide overflow mitigation at some of Watercare's largest wastewater overflows.
- The **“CSO Collector Sewers”**, which comprise a series of smaller sewers that extend out from the main project works into the local catchments to provide overflow mitigation at the numerous network overflow locations.

This concept is represented schematically in Figure 1-2 below, with the main tunnel shown in purple, the link sewers in black, and the CSO Collector Sewers in blue.

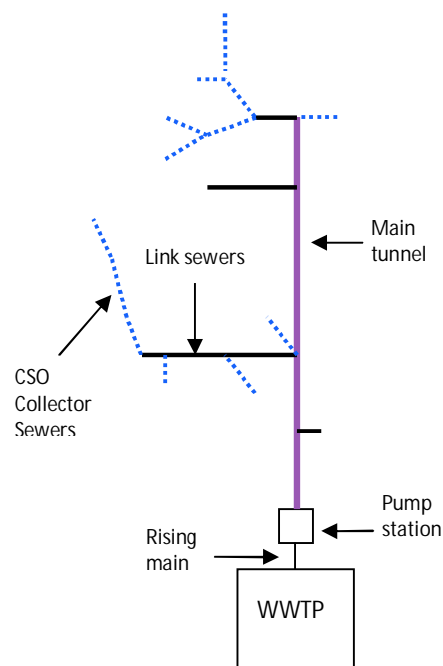
The construction for the Central Interceptor scheme (i.e. the main project works and the CSO Collector Sewers) is expected to take place between 2017 and 2027, and will cost in the order of \$800 million.<sup>1</sup> The main project works will occur first, commencing in 2017, and are expected to be completed in 2023.

The Central Interceptor scheme is within the jurisdiction of Auckland Council. Watercare intends to designate some of the land required for the works in the Auckland Council District Plans (Manukau and Auckland City Isthmus Sections). Aspects of the work also require resource consents under those plans and the Auckland Council Regional Plans. Watercare is seeking the Resource Management Act 1991 (RMA) approvals for the two elements of the Central Interceptor scheme separately as the two packages are quite different in extent of works and potential construction effects. This Assessment of Effects on the Environment (AEE) report has been prepared to support the Notices of Requirement (NoR) and resource consent applications for the **main project works**.

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<sup>1</sup> Cost estimates are in New Zealand 2011 dollars.

Ultimately, the Central Interceptor may be extended to the Auckland Central Business District (CBD). However, the timing for any such extension is not known and it does not form part of this NoR and consent applications.



**Figure 1-2 Schematic of Central Interceptor Scheme**

## 1.2 Overview of the main project works

### 1.2.1 Summary of the physical works

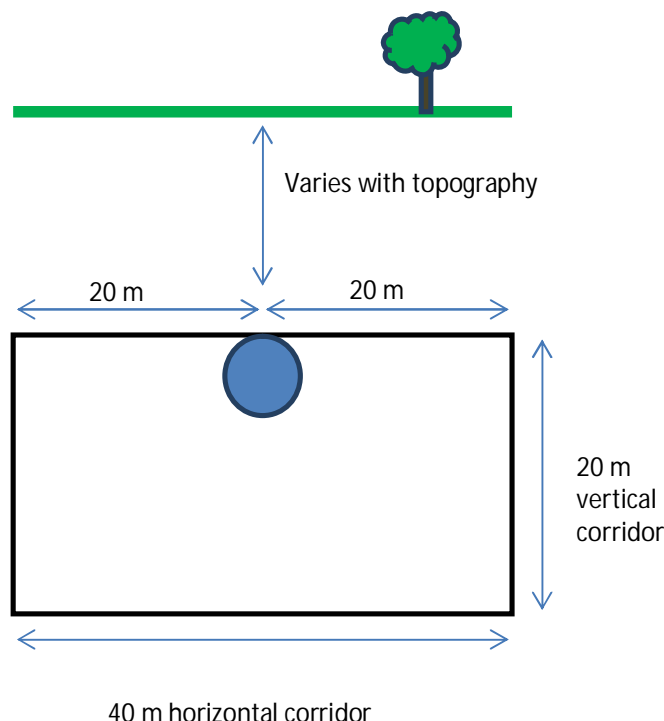
In summary, the Central Interceptor main project works comprise:

- A new sewer tunnel between Western Springs and the Mangere WWTP, approximately 13 km in length and up to about 110 m (current design) below the ground surface. The tunnel will be concrete lined with an internal diameter of between about 3.5 m and 5 m. A tunnel diameter of 4.5 m has been used in the design work completed to date. This provides a storage capacity of around 200,000 m<sup>3</sup>.
- Three link sewer tunnels and a smaller piped link sewer connecting to the main tunnel. In total, the link sewer tunnels will be about 5 km in length and will also be concrete lined. An internal diameter of 2.4 m has been used in design work in most cases; however, this may be changed depending on construction methods.
- Connections between the existing Watercare transmission sewer network (the transmission network comprises the large sewers which provide bulk wastewater conveyance) and the main tunnel and link sewer tunnels to divert flow from the existing network to the Central Interceptor.
- Associated structures at the connection points, including access shafts, drop shafts, flow control structures, overflow structures, grit traps, air vents and air treatment facilities.
- A new pump station at the Mangere WWTP to pump wastewater from the tunnel to the plant.

Until the detailed design has been completed, the final alignment for the tunnels will not be confirmed. Accordingly resource consents are being sought for a corridor within which the tunnels will be finally located. Horizontally, the tunnels will be located within a 40 m wide corridor centred on the alignment shown in Figure 1-1 (i.e. 20 m either side of the alignment). Vertically, the tunnels will be located within a 20m high corridor, with the level of the vertical corridor varying along the alignment due to the required hydraulic grade of the tunnels and the topography of the land above. At the Western Springs



site the vertical corridor extends from approximately -9m RL to -29m RL, while at the Mangere Pump Station site it extends from approximately -23m RL to -43m RL. This is illustrated generally below in Figure 1-3. Link Sewers 1, 2 and 3 will be located within a similar vertical corridor (refer Section 5.2.1).



**Figure 1-3 Schematic of main tunnel vertical and horizontal corridor**

The final level of the tunnels will be determined by the geological conditions along the alignment and the selected construction method.

The project has been developed to a concept design stage and it is likely that some design and construction details will change as the project is optimised in the detailed design and construction stages. While the layouts and dimensions provided in the AEE and drawings are approximate, the designs represent an appropriate basis for assessing the potential effects arising from construction, operation and maintenance of the main project works.

### 1.2.2 Summary of the construction sites

The Central Interceptor main project works will be constructed by tunnelling methods with the construction largely occurring underground, but facilitated by construction sites where activities will also occur at the surface. The construction sites (shown on Figure 1-1) are at 19 locations along the main tunnel and link sewer routes as follows:

- Three primary construction sites which will serve as the main construction bases for the tunnelling activities. Earth (spoil) from the tunnelling work will be removed from these sites via the construction shaft, which will also provide access to the tunnel, will serve to launch the tunnel boring machine (TBM) and will provide access for supply of construction materials and services. These construction sites could operate for around five to six years, depending on the construction methods employed, and are located at:
  - Western Springs (WS1)
  - May Road (WS2)
  - Mangere WWTP (WS3)

- Sixteen secondary construction sites to provide the permanent connections to the main tunnel and to the link sewer tunnels. Seven of these sites are on the route of the main tunnel and would likely operate for around 12 to 18 months<sup>2</sup> each as the shaft is excavated and permanent works are constructed. These sites are:
  - Mount Albert War Memorial Reserve (AS1)
  - Lyon Avenue (AS2)
  - Haverstock Road (AS3)
  - Walmsley Park (AS4)
  - Keith Hay Park (AS5)
  - Pump Station 23 (Frederick Street) (AS6)
  - Kiwi Esplanade (AS7)

Ten of the 16 secondary construction sites provide connections to the link sewers. These sites would likely operate for around 6 to 18 months<sup>3</sup> each (depending on the scale of works at the site) as the shaft is excavated and permanent works are constructed. However, the tunnelling methods for the link tunnels may be different to the main tunnel and these sites may also have a range of additional construction activities to facilitate the works. These link sewer sites are located at:

- Motions Road (L1S1)
- Western Springs Depot (L1S2)
- Rawalpindi Reserve (L2S1)
- Norgrove Avenue (L2S2)
- Mount Albert War Memorial Reserve (L2S3)<sup>4</sup>
- Pump Station 25 (in Miranda Reserve) (L3S1)
- Miranda Reserve (L3S2)
- Whitney Street (L3S3)
- Dundale Avenue (L3S4)
- Haycock Avenue (L3S5)

The construction activities at the primary and secondary sites will include a wide range of activities, such as removal of vegetation, earthworks, relocation of services, establishment of site access, construction yards and lay down areas, traffic management, works in watercourses, construction of the physical works, commissioning and site reinstatement. In addition, at the existing Watercare pump station (PS 23) on the edge of the Manukau Harbour at Hillsborough Bay, a temporary construction platform will be required in the CMA to facilitate the construction activities.

### 1.3 CSO Collector Sewers project overview

As noted above, the overall Central Interceptor scheme also involves a series of smaller CSO Collector Sewers that extend out from the main project works into the local network (the local network comprises the smaller sewers that connect to Watercare's residential and commercial customers) and provide further targeted wastewater overflow mitigation.

The CSO Collector Sewer works could occur as part of a separate construction contract and their timing would likely follow the completion of the main project works. Accordingly, the CSO Collector Sewers are described in a separate AEE report. The CSO Collector Sewers will have benefits for

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<sup>2</sup> Total occupation will range from 2 to 5 years due to the intermittent nature of works.

<sup>3</sup> As with the other secondary sites, total occupation will range from 2 to 5 years due to the intermittent nature of works.

<sup>4</sup> Mount Albert War Memorial Reserve is both a main tunnel (AS1) and link sewer (L2S3) construction site (hence the reason it is repeated in both lists).



water quality, public health risk, and amenity in the Motions, Meola, Oakley, and Whau catchments and Waitemata Harbour receiving environments.

There is, however, some overlap between the main project works and the CSO Collector Sewer works, primarily where the CSO Collector Sewers connect to the main project works. Where overlap exists, the CSO Collector Sewer connection works have been included here in this main project works application, and where there is no overlap they are not included in this application.

#### **1.4 Network discharges**

The Auckland Isthmus is serviced by the older components of Watercare's wastewater network. Much of this network was constructed in the earlier part of the 20<sup>th</sup> century to support a developing Auckland. The network servicing this area was constructed largely as a combined sewer system, where both wastewater and stormwater drain to the same pipe network. During dry weather conditions the pipe system conveys wastewater. However, during rainfall, stormwater enters the system and when the pipe is at capacity, the combined wastewater and stormwater flow discharges to the environment at specifically designed overflow locations, thereby avoiding uncontrolled discharges elsewhere in the network. While improvements have been made to this network over the years, stormwater inflows remain significant and will continue to increase with increasing growth and development.

There are some 122 active combined sewer overflow points on the wastewater network in the Central Interceptor catchment area, which currently discharge in the order of 2,200,000 m<sup>3</sup> of diluted wastewater to the environment on an average annual basis. These overflows affect the natural values of Motions Creek, Meola Creek, Oakley Creek, Whau Creek, and the coastal waters around Point Chevalier and the Waterview Inlet, creating potential public health risks for recreational users, and reducing the environmental, amenity and cultural values of the waterbodies. With ongoing growth and development of the Auckland Isthmus this situation will continue to worsen if no improvements are made.

The Central Interceptor scheme has been designed to capture, store and convey for treatment wet weather overflows from the wastewater network in the Central Interceptor catchment. The main project works will provide overflow reduction at Watercare's largest network overflows located on the transmission network, while the CSO Collector Sewers will provide overflow reduction at the many overflows located on the local network. On completion of the main project works significant environmental benefit is gained in the Meola Catchment, and this benefit is further extended into the Motions, Oakley and Whau catchments and to the local coastal waters on completion of the CSO Collector Sewers.

There will inevitably be significant wet weather events that exceed the storage capacity of the Central Interceptor scheme and when that happens, overflow from the wastewater network will occur. Watercare has separately applied for a network discharge consent from Auckland Council to authorise discharges from the public wastewater network in the Central Interceptor catchment. Once the Central Interceptor scheme is completed, the scheme will reduce the average annual wastewater overflow volumes discharged from this network by approximately 80%. This equates broadly to network overflow discharges in 6 – 12 storm events in an average year, down from the many hundreds of events that currently occur.

#### **1.5 Report structure and purpose**

The purpose of this AEE report is to describe the Central Interceptor main project works, the alternatives considered, the consultation undertaken and the potential effects arising from the works. The report also assesses the project against the relevant statutory documents.

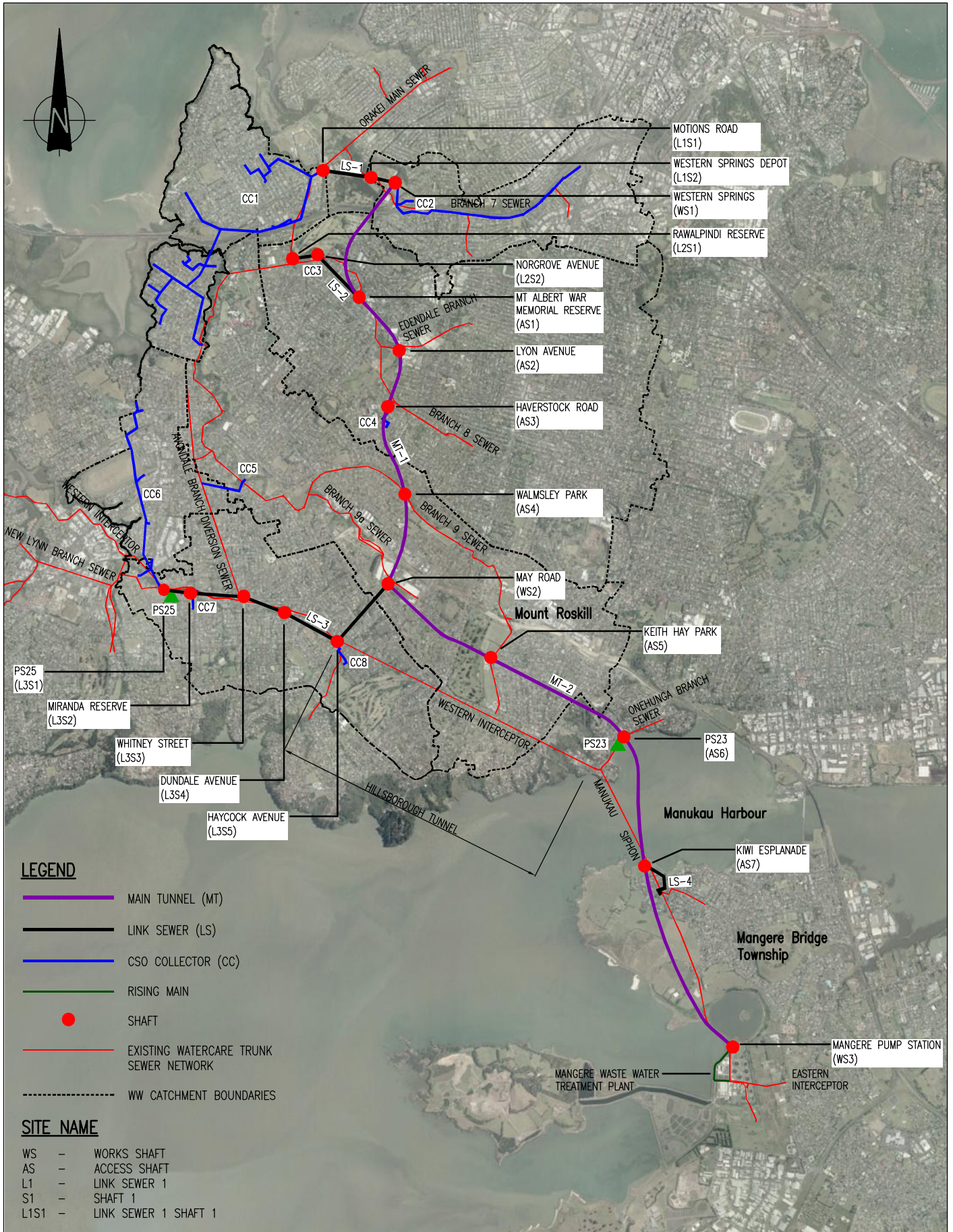
The report has been prepared in accordance with the relevant provisions of the RMA and provides information in support of the NoRs and resource consent applications. The scope of the NoRs and resource consents sought are set out in detail in Section 2 of this report.

The AEE comprises four parts as listed below:

<b>Central Interceptor Main Project Works – Assessment of Effects on the Environment</b>	
<b>Part A</b>	Assessment of Effects on the Environment
	Appendix A                      Application forms
	Appendix B                      Objectives and policies assessment
	Appendix C                      Schedule of properties
	Appendix D                      Planning maps
<b>Part B</b>	Site Specific Assessments
	Appendix A                      Certificates of title
	Appendix B                      Stormwater calculations
<b>Part C</b>	Drawing Set
<b>Part D</b>	Technical Reports
	Technical Report A              Landscape and Visual Assessment
	Technical Report B              Arboricultural Assessment
	Technical Report C              Assessment of Ecological Effects
	Technical Report D              Archaeological Assessment
	Technical Report E              Traffic Impact Assessment
	Technical Report F              Noise Impact Assessment
	Technical Report G              Vibration Assessment
	Technical Report H              Odour Assessment
	Technical Report I              Ground Contamination Assessment
	Technical Report J              Groundwater and Surface Settlement Assessment
	Technical Report K              Erosion and Sediment Control and Stormwater Management

Part A (this report) includes a description of the proposed works, including typical site facilities, the potential construction methods, an assessment of effects on the environment, and consideration of the proposed works against the relevant statutory provisions. As there are 19 separate construction sites, each with its own characteristics, Part B contains further detail on the proposed works, construction activities, the existing environment, and the anticipated effects on the environment at each of these sites.

The proposed works are described in the following sections of this report and in Part B, with reference to drawings contained within the separate A3 Drawing Set (Part C of the AEE), titled “Central Interceptor Main Project Works – Assessment of Effects on the Environment – Drawing Set” (referred to hereafter as “**the drawing set**”).



**LEGEND**

- MAIN TUNNEL (MT)
- LINK SEWER (LS)
- CSO COLLECTOR (CC)
- RISING MAIN
- SHAFT
- EXISTING WATERCARE TRUNK SEWER NETWORK
- - - WW CATCHMENT BOUNDARIES

**SITE NAME**

- WS - WORKS SHAFT
- AS - ACCESS SHAFT
- L1 - LINK SEWER 1
- S1 - SHAFT 1
- L1S1 - LINK SEWER 1 SHAFT 1

A	17/08/12
ISSUE	DATE

**CENTRAL INTERCEPTOR  
GENERAL  
OVERALL SITE LAYOUT**

AEE AUGUST 2012

COPYRIGHT - This drawing, the design and concept, remain the exclusive property of Watercare Services Limited and may not be used without approval. Copyright reserved.

CAD FILE FIGURE 1.1		DATE 26-Jul-12	
ORIGINAL SCALE A4		CONTRACT No.	
1:62500 A4		0538	
DRAWING No.		ISSUE	
FIGURE 1.1		A	



## 2.0 Notices of requirement and resource consent applications

### 2.1 Overview

Watercare is a network utility operator approved under s167 of the Resource Management Act 1991 (RMA). Watercare proposes to designate land for the Central Interceptor main project works in accordance with s168 of the RMA and the works also require a number of resource consents. The scope of the NoRs and resource consents sought for the main project works are outlined in the following sections.

### 2.2 Notices of requirement

Watercare proposes to designate the construction sites. The following NoRs to designate land have been lodged with Auckland Council for the main project works:

- NoR 1: Notice of Requirement to Auckland Council for works within the Auckland Council District Plan (Auckland City Isthmus Section) area
- NoR 2: Notice of Requirement to Auckland Council for works within the Auckland Council District Plan (Manukau Section) area

The NoRs are bound as a separate document and include plans showing the extent of the proposed designations. The extent of the proposed designation at each site is also shown on drawings included in the drawing set in Part C. This AEE assesses the effects of the works to be authorised by these NoRs.

#### 2.2.1 Purpose of designations

The purpose of the designations is for “the construction, operation, and maintenance of wastewater infrastructure”. The activities to be authorised by the designation are described in Sections 5 and 6 of this report and in Part B.

#### 2.2.2 Extent of designations

The physical extent of the proposed designations is shown on the designation plans included as Attachment 1 of the NoRs. The designations include permanent works as well as temporary construction works. Vertically, the designations will extend to include works both above and below ground.

The designation area at each of the sites for the construction phase of the project allows for the following:

- Refinements to the site layout, alignment and design as a result of the detailed design process;
- Changes in site layout and alignment required during construction – e.g. the discovery of otherwise unknown services or other underground features, or unexpected ground conditions;
- Accommodation of all of the required physical works including sewer connections, shafts, air treatment facilities, connection and control chambers etc;
- Services relocation, temporary traffic management and all associated construction activities;
- Temporary construction access roads; and
- Site establishment activities, including storage of plant, equipment and materials; crane set-up; site offices; erosion and sediment control; dewatering and groundwater treatment facilities; machinery working and safety areas; and temporary diversion of pedestrian and vehicular access.

On completion of construction, the extent of the designations will be reviewed. Areas of the designations not required for permanent works, inspection, or maintenance activities will be removed where it is reasonable to do so. This is a relatively simple process under s182 of the RMA.

### 2.2.2.1 Land within designations

A schedule of properties directly affected by the proposed designations is included as Attachment 2 of the NoRs. In summary, the proposed designations directly affect the following land:

**Table 2-1 Summary of land directly affected by the designations**

Owner type	NoR 1 (Auckland City District Plan)	NoR 2 (Manukau District Plan)
Private	6 properties at: Western Springs (CSO) Lyon Avenue May Road Keith Hay Park Haycock Avenue	nil
Crown	11 properties at: Western Springs (CSO) Lyon Avenue Haverstock Road Keith Hay Park Rawalpindi Reserve	nil
Council (non road reserve)	20 properties at: Western Springs (CSO) Mount Albert War Memorial Reserve Walmsley Park Keith Hay Park Motions Road Rawalpindi Reserve Norgrove Avenue PS25 (Miranda Reserve) Miranda Reserve	2 properties at: Kiwi Esplanade
Council (road reserve)	6 properties at: Haverstock Road Keith Hay Park Norgrove Avenue Whitney Street Dundale Avenue Haycock Avenue	nil
Council owned (Regional Facilities Auckland)	1 property at: Western Springs	nil
Watercare owned	PS 23 (Frederick Street)	nil

### 2.2.3 Existing Watercare designations

#### 2.2.3.1 Designations at construction sites – Auckland City District Plan

The new designations will partly overlies existing Watercare designations (for wastewater purposes) in the Auckland City District Plan at the following sites:

- Lyon Avenue (E06-06);
- Pump Station 23 (Frederick Street) (H08-02); and
- Pump Station 25 (Miranda Reserve) (G03-03).

These sites are included in the proposed designation as the proposed works extend beyond the existing designations and to enable consistent conditions to apply across the project.

### **2.2.3.2 Works in accordance with existing designations – Manukau District Plan**

Proposed works will take place within the following existing designations in the Manukau District Plan:

- Witla Court (Designation 145);
- Ambury Park (Designation 153); and
- Mangere WWTP (Designation 144A).

Proposed works at 4 Witla Court are within the scope of, and authorised by, the existing designation 145 in the Manukau District Plan which is for wastewater purposes – pipelines, chambers and associated structures. The works under Ambury Park to which designation 153 in the Manukau District Plan applies, and the works at the Mangere Pump Station site (adjacent to the Mangere WWTP) to which designation 144A applies, are also within the scope of, and authorised by, these existing designations. The proposed Central Interceptor works are within the scope of the designations as the works are an integral part of the "Wastewater treatment plant processes and ancillary activities" in designation No 144A and "Wastewater Purpose" in designations No 153 and 145. Outline Plans of Works (OPWs) will be submitted for works within these existing designations (and the proposed new designations) at a later date.

Those existing designations provide the necessary land use authorisations for the work, but regional resource consents are still required. The proposed works at the Mangere Pump Station (WS3) are therefore described in this report to provide context and an understanding of the project as a whole, as well as to address matters that require regional resource consents at the site.

## **2.3 Applications for resource consents**

Resource consents are required from Auckland Council for the construction and operation phases of the project. A list of the consents sought and the relevant plan rules is included in Table 2-2 below.

For the avoidance of doubt, Watercare is seeking resource consents under the rules below and any other rules which may apply to the activity, even if not specifically noted.

**Table 2-2 Resource consent requirements**

AC Form	Activity Type	Activity	RMA Ref	Rule	Activity Status	Geographic Extent	Comment	Effects Section Ref
Auckland Council District Plan (Auckland City Isthmus Section)								
B3	Land use activities	Earthworks beyond permitted activity limits	s9	4A.2B 5B.7.3(b) 7.7.1 9.7.1 4A.1.A(ii)	RC D RC RC NC	Project wide	All tunnels outside of designations or road reserve	Part A Section 11.11
		Land subject to instability	s9	5D.6.1	RD	Project wide	All tunnels where properties above the tunnels identified as being subject to instability by Auckland Council outside of designations or road reserve	Part A Section 11.3
Auckland Council District Plan (Manukau Section)								
B3	Land use activities	Construction of network utility service	s9	7.8.2.1	D	Link Sewer 4 and Main Tunnel	Link Sewer 4 and Main Tunnel outside of designation	Part A Section 11.6 Part A Section 12.18
		Construction of network utility service located beneath roads	s9	7.8.2.2	RD	Link Sewer 4	Link Sewer 4 in road reserve	Part A Section 11.6 Part A Section 12.18
		Earthworks beyond permitted activity limits	s9	9.8.2	RD	Link Sewer 4	Link Sewer 4 in road reserve	Part A Section 12.18



AC Form	Activity Type	Activity	RMA Ref	Rule	Activity Status	Geographic Extent	Comment	Effects Section Ref
		Removal of existing pump station structure	s9	15.10.2	C	Kiwi Esplanade	In Kiwi Esplanade reserve	Part B Section 9B
		Tree removal/ works in dripline/rootzone of trees associated with removal of existing pump station structure and construction of Link Sewer 4	s9	6.9.2	D RD	Kiwi Esplanade	In Kiwi Esplanade reserve and Link Sewer 4	Part B Section 9B Part A Section 12.18
<b>NES for Assessing and Managing Contaminants in Soil to Protect Human Health</b>								
B3	Land use activities	Disturbance of contaminated sites	s9	Cl 11	D	Project wide	All construction sites and all surface trenching works	Part A Section 12.2 Part B all sections Part D Appendix I
<b>Auckland Council Regional Plan: Sediment Control</b>								
B15	Land disturbing activities	Earthworks above permitted limits	s9	5.4.2.1 5.4.3.1	C RD	Project wide	All construction sites and all surface trenching works	Part A Section 12.13 Part B all sections Part D Appendix K
<b>Auckland Council Regional Plan: Air, Land and Water</b>								
B11	Water take and/or diversion	Taking/diverting groundwater due to construction and dewatering of tunnels and shafts	s14	6.5.43 6.5.77	RD	Project wide	All tunnels and shafts	Part A Section 11.2 Part B all sections Part D Appendix J
B19	To discharge contaminants	Construction site related activities (e.g. tunnel	s15	5.5.68	D	Project wide	All construction sites and tunnels	Part A Section 12.15

AC Form	Activity Type	Activity	RMA Ref	Rule	Activity Status	Geographic Extent	Comment	Effects Section Ref
	into or onto land or water	dewatering, wheel wash; application of grout and concrete to land etc)						
B16	To discharge stormwater	Discharge of stormwater from permanent works	s15	5.5.2	C	Western Springs Haverstock Road PS 25 (Miranda Reserve)	Construction site with permanent impervious works over 1000m <sup>2</sup>	Part A Section 12.14 Part B Sections 1A, 4, 8, and 15
B16	To discharge stormwater	Discharge of stormwater from permanent works	s15	5.5.3	RD	May Road	Construction site with permanent impervious works over 5000m <sup>2</sup>	Part A Section 12.14 Part B Section 6
B16	To discharge stormwater	Discharge of stormwater during construction works	s15	5.5.2 5.5.3 5.5.4	C RD D	All construction sites	Construction sites with temporary impervious works over 1000m <sup>2</sup>	Part A Section 12.13 Part B – for each site
B20	To discharge contaminants to air	Discharges from tunnels and pump station at drop shafts and odour treatment facilities	s15	4.5.82	RD	Project wide	All construction sites	Part A Section 12.10 Part B all sections Part D Appendix H
B22	Disturbance management and discharge from contaminated land	Disturbance of contaminated sites (construction sites)	s15	5.5.44A	RD	Project wide	All construction sites and all surface trenching works	Part A Section 12.12 Part B all sections Part D Appendix I

AC Form	Activity Type	Activity	RMA Ref	Rule	Activity Status	Geographic Extent	Comment	Effects Section Ref	
Auckland Council Regional Plan: Coastal									
B23	Coastal activities	Main tunnel							
		Erection, occupation and use of tunnel and associated disturbance	s12	10.5.9	D	Main tunnel	Manukau Harbour	Part A Section 11.12	
				10.5.10	NC				
				11.5.5	D				
				12.5.17	RD				
				12.5.18	D				
				12.5.22	NC				
				16.5.17	RD				
		16.5.23	NC						
		PS 23 (Frederick Street)							
		Construction, occupation, use and removal of temporary construction platform and associated disturbance	s12	12.5.18	D	PS 23 (Frederick Street)	Manukau Harbour	Part A Section 12.11 Part B Section 8.6	
				10.5.9	D				
				11.5.5	D				
17.5.1	D								
16.5.17	RD								
Erection, occupation and use of permanent seawall at PS 23 and associated disturbance	s12	10.5.9	D	PS 23 (Frederick Street)	Manukau Harbour	Part A Section 12.11 Part B Section 8.6			
		11.5.5	D						
		12.5.18	D						
		16.5.17	RD						

AC Form	Activity Type	Activity	RMA Ref	Rule	Activity Status	Geographic Extent	Comment	Effects Section Ref
		Discharge of stormwater from PS 23 (Frederick Street) site during construction and from permanent works (including from temporary construction platform during construction)	s15	20.5.12	C	PS 23 (Frederick Street)	Construction site with impervious works over 1000m <sup>2</sup>	Part A Sections 12.13 and 12.14 Part B Section 8
		Removal of mangroves and disturbance of CMA associated with construction and removal of temporary construction platform	s12	16.5.17	RD	PS 23 (Frederick Street)	Manukau Harbour	Part A Section 12.11 Part B Section 8.6
<b>Kiwi Esplanade</b>								
		Discharge of stormwater during construction	s15	20.5.12	C	Kiwi Esplanade	Construction site with impervious works over 1000m <sup>2</sup>	Part A Section 12.13 Part B Section 9A
<b>Mangere Pump Station</b>								
		Erection, occupation and use of emergency pressure relief pipeline outlet structure at Mangere Pump Station and associated disturbance	s12	10.5.9 11.5.5 12.5.18 16.5.17	D D D RD	Mangere Pump Station	Manukau Harbour	Part A Section 12.11 Part B Section 10.6
		Removal of mangroves and disturbance of CMA associated with construction	s12	16.5.17	RD	Mangere Pump Station	Manukau Harbour	Part A Section 12.11 Part B Section 10.6

AC Form	Activity Type	Activity	RMA Ref	Rule	Activity Status	Geographic Extent	Comment	Effects Section Ref
		of EPR structure						
		Discharge of stormwater during construction and from permanent works	s15	20.5.12	D	Mangere Pump Station	Construction site with impervious works over 10,000m <sup>2</sup>	Part A Section 12.13 and 12.14 Part B Section 10
		Discharge from emergency pressure relief structure at Mangere Pump Station	s15	20.5.11	D <sup>5</sup>	Mangere Pump Station	Manukau Harbour	Part A Section 12.11 Part B Section 10.6

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<sup>5</sup> The reference to non-complying activity status in the Advice Note to the rule is out of date and is in the process of being updated through the resolution of outstanding appeals to the ARP: C

## **2.4 Land within consent corridor**

A schedule of properties within the horizontal corridor for which resource consents are sought is included in Appendix C.

## **2.5 Lapse**

Construction works are expected to commence around 2017 and be complete in 2023. However, the project is large and complex and flexibility is required. As a precaution, an extended lapse period of fifteen years from the date of inclusion of the designations in the district plans is therefore sought for the designations (refer RMA s184) and fifteen years from the date of granting of the resource consents (refer RMA s125).

## **2.6 Other consents and approvals**

### **2.6.1 Outline Plan of Works**

Section 176A of the RMA requires the submission of an OPW and sets out the requirements for submission of an OPW for works to be constructed on designated land. OPWs will be prepared as appropriate in accordance with s176A(3) of the RMA prior to the commencement of construction.

### **2.6.2 Requiring authority approvals**

Some of the construction sites in the Auckland City District Plan area are subject to designations of other Requiring Authorities. These are:

- Western Springs: C06-08: Auckland Council, Council carpark;
- Lyon Avenue: E05-24: Mount Albert Grammar School;
- Keith Hay Park (micro tunnel site): F05-05 Proposed motorway/railway/road, G08-05 railway purposes (Avondale Southdown line);
- Motions Road: C05-10: Auckland Council, Council carpark; and
- Norgrove Avenue, Whitney Street, Dundale Avenue, Haycock Avenue: B08-04 public roads.

Other designations above the alignment of the tunnels (over land in the 40 m corridor that the tunnels will be passing beneath) in the Auckland City District Plan area are:

- Public roads (B08-04);
- Hillsborough Primary School (Belfast Street) (H08-01);
- Marshall Laing Primary School (Marshall Laing Avenue) (G05-03);
- Wesley Intermediate School (O'Donnell Avenue) (F06-02);
- Glenavon Primary School (G04-01)
- Motorway (A07-01) and Waterview (A01-07E);
- State Highway 20 (H08-05);
- Proposed regional road (D05-06);
- Railway purposes – North Auckland Railway (H13-09);
- Council carpark (D05-03);
- Council carpark (D06-08);
- Vector pipeline (G03-07); and
- Power substation (White Swan Road) (G05-01).

Designations above the alignment of the main tunnel (over land in the 40 m corridor that the tunnel will be passing beneath) in the Manukau District Plan area are:

- New Zealand Refining Company Limited petroleum transmission purposes (Map 5, ID 296);
- Ambury Regional Park (Map 5, ID 153) (also designated for Watercare wastewater purposes).

The consultation undertaken to date with these Requiring Authorities is summarised later, in Section 8.0 of this report. Where Requiring Authority approvals are required under sections 176 (1)(b) and 177 (1) of the RMA, these will be sought prior to construction.

### **2.6.3 Other approvals**

Watercare intends to apply for a general authority under s12 of the Historic Places Act 1993 to destroy, damage or modify archaeological sites. Although no known archaeological sites are expected to be affected by the works at this stage, this authority will be sought as a precaution in case any unrecorded subsurface remains are exposed during earthworks.

Other approvals or agreements are, or may be, required under the Reserves Act 1977, Public Works Act 1981 and Building Act 2004. Any required processes under these Acts will occur in parallel with the statutory processes under the RMA or at a later date as appropriate. Watercare will follow the process under the Local Government (Auckland Council) Act 2009 and the Local Government Act 2002 for undertaking works on private land.

At a number of sites works will occur in the road reserve, which is subject to designation B08-04 in the areas covered by the Auckland City District Plan. Corridor Access Request (CAR) approvals will be required from Auckland Transport, NZTA and Kiwi Rail for works in roads, motorways, and rail corridors.



## 3.0 Watercare and the wastewater network

This section sets out an overview of Watercare and its roles and responsibilities, and presents a summary of the wastewater network, along with an overview of the regional planning framework that sets the context for the Central Interceptor scheme.

### 3.1 Watercare responsibilities and corporate goals

Watercare supplies potable water and collects, treats and disposes of wastewater in the Auckland Region. Watercare has supplied wholesale water supply and wastewater services since 1991. On 1 November 2010, Watercare took over ownership and management of all the water and wastewater assets within the Auckland Council area and became responsible for retail water and wastewater services as well. The services in the area of the former Papakura District Council are operated under franchise by Veolia Water.

Watercare is wholly owned by Auckland Council and became a Council Controlled Organisation (CCO) on 1 July 2012. The company's obligation to deliver water and wastewater services for Auckland are established under s57(1) of the Local Government (Auckland Council) Act 2009 which states that the organisation:

- a *must manage its operations efficiently with a view to keeping the overall costs of water supply and wastewater services to its customers (collectively) at the minimum levels consistent with the effective conduct of its undertakings and the maintenance of the long-term integrity of its assets; and*
- b *must not pay any dividend or distribute any surplus in any way, directly or indirectly, to any owner or shareholder; and*
- c *is not required to comply with s68(b) of the Local Government Act 2002; and*
- d *must have regard for public safety (for example, the safety of children in urban areas) in relation to its structures.*

Watercare's vision and key goals are set out in its Statement of Intent for the period 1 July 2012 to 30 June 2015. The vision is "outstanding and affordable water services for all the people of Auckland." "Outstanding" means Watercare will provide safe drinking water, promote efficient water use, and enhance the environment including ecosystems and the health and wellbeing of people and communities through the effective transport and treatment of wastewater. "Affordable" water services means that Watercare will run an efficient business and keep the overall costs of services to customers (collectively) at minimum levels.

Watercare has six main goals and focus areas that reflect the responsibilities and challenges of the company (refer Section 2 of Statement of Intent). These are:

- i. *Safe and Reliable water supply: To manage water resources to provide a safe and reliable water supply.*
- ii. *Healthy Waterways: To manage wastewater discharges to maintain or improve the health of the environment.*
- iii. *Sound financial management: To meet business objectives at the lowest cost.*
- iv. *Effective Asset Management: To maximise the use of existing assets while optimising the scope, timing and costs of new investments.*
- v. *Engaged People: To have a skilled, motivated and empowered workforce.*
- vi. *Satisfied customers and stakeholders: to provide great service and great value.*

### 3.2 Organisational structure

Watercare's organisational structure reflects the nature of the business, which is to provide affordable water and wastewater services to the people of Auckland. The organisation consists of:

- The Office of the Chief Executive;

- Infrastructure;
- Operations;
- Financial Management; and
- Customer Services.

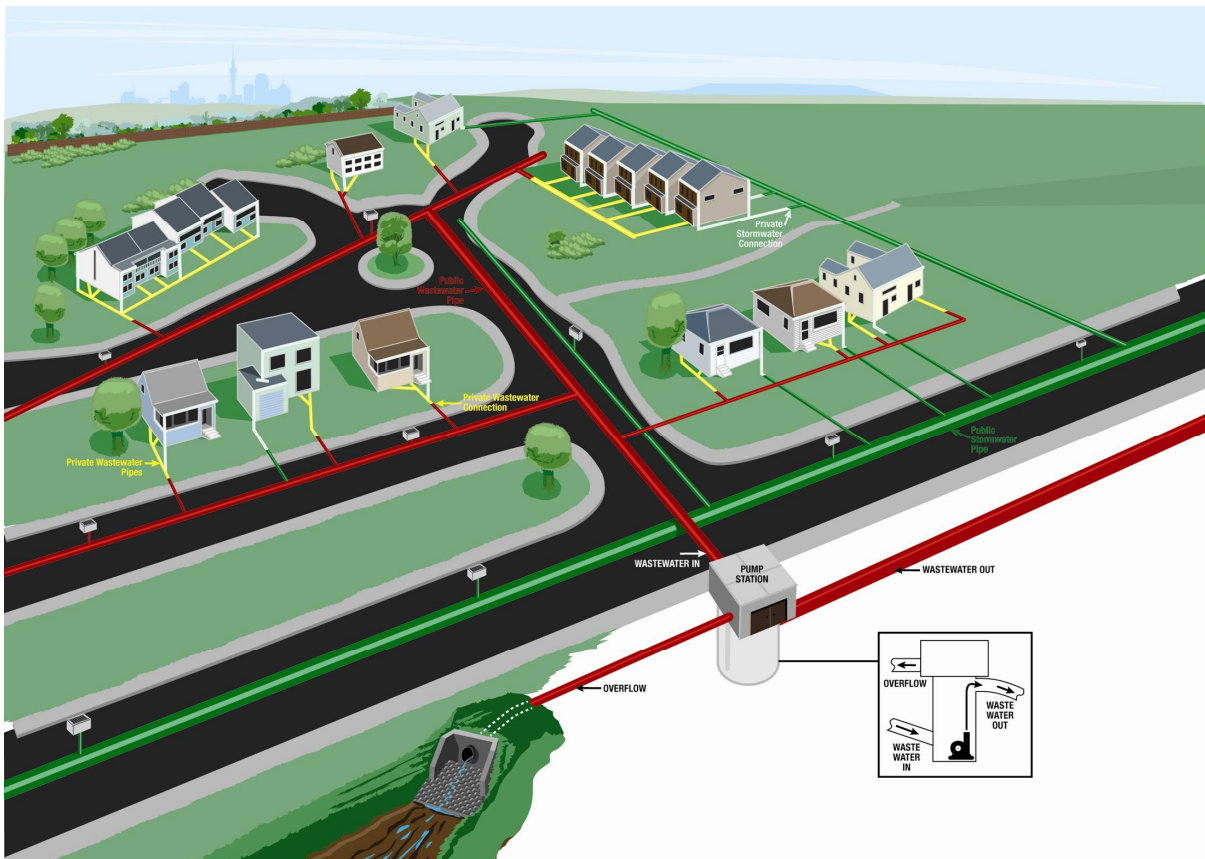
The Infrastructure and Operations groups are responsible (respectively) for planning for future wastewater network needs, and for the day to day operations and management.

### 3.3 Purpose of a wastewater network

Modern urban communities and cities rely on reticulated wastewater networks for the conveyance of wastewater generated by residential, commercial and industrial activities to treatment and disposal facilities.

Prior to the construction of the wastewater system in Auckland, untreated wastewater was discharged to the Waitemata and Manukau Harbours directly. The development of the metropolitan wastewater network and subsequent significant upgrades made over the years have led to significant improvements in the freshwater and coastal environments of urban Auckland, and have contributed significantly to the public health of the community and reduced the risks of transmission of waterborne diseases.

A wastewater network comprises pipes originating from connections to individual houses, and to commercial and industrial buildings, joining to larger pipes that service neighbourhoods or industrial estates (local network), which in turn connect to large transmission pipelines (transmission network) that convey the wastewater to the treatment facility. A general representation of a typical urban wastewater network is shown in Figure 3-1.



**Figure 3-1: Typical urban wastewater network**

Networks are typically designed to rely on gravity for flow conveyance where this is possible. Where topographic constraints do not allow flow within the wastewater network to occur under gravity

conditions, pump stations are installed to pump wastewater, via a pipe termed a rising main, to a point where gravity flow is possible. All wastewater networks are constrained by the capacity of the pipe system; when the pipe is full the network will overflow. To ensure that wastewater overflows occur in a controlled fashion, and to minimise the public health risk of flows backing up and discharging inside homes or in places where contact with wastewater is possible, engineered network overflow locations are often provided.

### **3.4 Watercare's wastewater network**

Watercare's wastewater network comprises approximately 7,700 km of wastewater pipes and 488 pump stations. The main wastewater treatment plants servicing metropolitan Auckland are the plants at Mangere (the Mangere WWTP, servicing the metropolitan area within the former Waitakere, Auckland, Manukau and Papakura District boundaries), and Rosedale on the North Shore. The Auckland Isthmus and Central Interceptor catchment area are serviced by the Mangere WWTP. The wastewater network delivering flow to the Mangere WWTP is shown on Figure 3-2.

The wastewater network servicing the Auckland Isthmus is a system of large transmission interceptors and branch sewers for bulk wastewater conveyance (the transmission network), and a system of local sewers for service connections to Watercare's customers (the local network).

The transmission network consists of four key interceptor sewers:

- Orakei Main Sewer;
- Eastern Interceptor;
- Western Interceptor; and
- Southern and South Western Interceptor.

Of these, the Western, Eastern and South Western interceptors connect directly to the Mangere WWTP. The Orakei Main Sewer, the oldest part of the Auckland wastewater network, connects to the Eastern Interceptor at Okahu Bay. Each element of the network is broadly described below.

#### **3.4.1 Orakei Main Sewer**

The Orakei Main Sewer was constructed predominantly between 1908 and 1914 as a combined sewer system. It extends upstream from Okahu Bay to the Waterview area, servicing the suburbs of Mount Albert, Three Kings, Point Chevalier, Sandringham, Westmere, Grey Lynn, Ponsonby, the CBD, Newmarket, Remuera, Ellerslie and Meadowbank. The sewer is typically an egg shaped brick sewer.

Three branch sewers (Branches 6, 7 and 8) drain the catchment in the mid and upper reaches of the Orakei Main Sewer. Large parts of these catchments are serviced by a combined sewer system, and contain the largest overflow points on the network.

A fourth branch sewer, Branch 9, has been diverted from the Orakei Main Sewer into the Western Interceptor via a diversion sewer called the Avondale diversion. Until the Avondale diversion was completed, Branch 9 was previously the uppermost branch draining to the Orakei Main Sewer.

In 2009 a 3 km section of the downstream end of the Orakei Main Sewer, including the above ground section across Hobson Bay, was replaced with a tunnel (referred to as Project Hobson) that provides storage and some overflow mitigation for areas to the east of the Auckland CBD.



**Figure 3-2: Wastewater network delivering flow to Mangere WWTP (Central Interceptor catchment area shaded)**

### **3.4.2 The Eastern Interceptor**

The Eastern Interceptor was constructed in the 1960s, in conjunction with the Mangere WWTP. It extends from the new pump station at Okahu Bay (PS64) to the Mangere WWTP. Branches from Eastern Bays, Howick and Tamaki discharge to the mid-reaches of the Eastern Interceptor.

### **3.4.3 The Western Interceptor**

Auckland's western catchments gravitate via the Swanson, Whenuapai and Glen Eden Branch sewers to the Western Pump Station (PS44) in Te Atatu where flow is pumped into the Western Interceptor, which then gravitates to St Georges Pump Station at Miranda Reserve in Blockhouse Bay (PS 25) and then via the Hillsborough Tunnel and Manukau Siphon (under the Manukau Harbour) to the Mangere WWTP. The Western Interceptor was constructed in the 1960s, in conjunction with the Mangere WWTP.

The Onehunga Branch sewer, servicing a largely industrial catchment to the west of Mount Wellington, enters the Western Interceptor immediately upstream of the Manukau Siphon. The Manukau Siphon itself comprises a single barrel 1550 mm diameter siphon that crosses the Manukau Harbour between Onehunga and Mangere. The Manukau Siphon and the upstream Hillsborough Tunnel have been identified as being high risk and in critical need of upgrade. Portions of this

infrastructure have been identified to be in poor condition and at present there is an inability to divert flows around these elements for maintenance and risk management. It is important that such risk is addressed.

#### **3.4.4 The South Western Interceptor and Southern Interceptor**

The South Western Interceptor serves the southern catchments of Auckland and was built in the 1990s to provide extra capacity to deal with growth in South Auckland. It was required to prevent the capacity of the Southern Interceptor being exceeded. The Southern Interceptor discharges to the Eastern Interceptor at Otahuhu.

### **3.5 Mangere Wastewater Treatment Plant**

Wastewater conveyed in the Western, Eastern and South Western Interceptors is delivered to the Mangere WWTP. The plant was first commissioned in 1960 but has been significantly upgraded since then, most recently as part of Project Manukau during the early 2000s. Project Manukau established a land based treatment process involving activated sludge reactor-clarifiers and UV disinfection, now producing a high quality effluent which is discharged to the Manukau Harbour. This enabled removal of the old oxidation ponds, and restoration of the harbour edge.

### **3.6 Regional wastewater planning**

Watercare has contributed to an extensive history of regional planning for wastewater services. Fundamental in this process has been assessing Auckland's future wastewater treatment plant and wider wastewater network (transmission interceptors/local network) needs. This regional planning process, and outputs from it, forms an important part of the context for the Central Interceptor scheme.

Importantly, Auckland's regional statutory planning framework recognises the financial challenge associated with finding solutions for upgrading the older parts of Auckland's wastewater network. That planning framework recognises that integrated solutions, addressing social, cultural, economic and environmental needs and limitations, are required to achieve the best outcomes

Key elements of the regional wastewater planning framework relevant to the development of the Central Interceptor scheme are summarised below.

#### **3.6.1 Three Waters Strategic Plan**

In December 2008 Watercare and Auckland's district and regional councils completed a joint four year strategic planning exercise, published as "Three Waters - Final 2008 Strategic Plan" (Watercare, 2008). This comprehensive exercise looked at long term planning relating to water supply, wastewater management, and stormwater. Watercare facilitated this strategic planning exercise working with the Auckland water and wastewater service providers and the Auckland territorial local authorities and Regional Council, along with government departments and community stakeholder groups.

A key conclusion from the Three Waters process was that ongoing wastewater treatment at the Mangere and Rosedale wastewater treatment plants represented the best medium to long term options for servicing Auckland's future needs. Having confirmed these facilities as the future basis for wastewater treatment, the Three Waters Strategic Plan then identified that:

*Our most immediate wastewater need is to provide trunk sewer capacity to central Auckland. This is required urgently to significantly reduce wet weather wastewater overflows that already occur and to avoid the occurrence of almost daily dry weather wastewater overflows, even in times of no or minor rainfall, by possibly as early as 2035. To meet this need, trunk sewer capacity to the Mangere Wastewater Treatment Plant will be augmented by way of a new Central Interceptor, with the final route and sizing optimised with the local network investment programmes to provide the least-cost regional solution (Watercare, 2008: p4).*

The Three Waters Strategic Plan stated that the Central Interceptor would provide major regional benefits, including:

- The provision of additional trunk sewer capacity to provide for growth on the Auckland Isthmus and in West Auckland;
- A substantial reduction in the risk of trunk sewer failures due to the ageing nature of parts of the network; and
- Opportunity to provide for a significant reduction in untreated wastewater discharges to the environment from the sewer network.

### **3.6.2 The Auckland Plan**

Auckland Council's Auckland Plan is the strategy that supports the vision of making Auckland "the world's most liveable city by 2040". It addresses how Auckland will accommodate a predicted population growth of 1 million people within the next 30 years, and possibly an additional million by 2100. It identifies opportunities and constraints to this projected growth in order to visualise what type of place Auckland will become and how it will need to change. To cope with the expected population increase, the Auckland Plan proposes a quality, compact city with the majority of new housing created within the current urban limits through higher density living.

Watercare has adopted the Auckland Council's medium growth population scenario (issued 9 May 2011) for its long-term strategic planning purposes. This scenario forecasts a population increase across the Auckland region from 1.48 million people to 1.75 million by 2022 and 1.95 million by 2031. There are currently around 1.26 million people connected to Watercare's metropolitan wastewater system. This is forecast to grow to 1.65 million people by 2031.

The Auckland Plan identifies existing and future locations for critical infrastructure to improve quality of life and help meet the vision of Auckland becoming the world's most liveable city. Strategic Direction 12 is to plan, deliver and maintain quality infrastructure to make Auckland liveable and resilient. The first of two priorities is to optimise, integrate and align network utility provision and planning. Stormwater management is identified as the third component of water services, which aligns with the Three Waters Strategic Plan addressed in Section 3.6.1. Responsibility for managing stormwater lies with Auckland Council.

The Auckland Plan notes that Auckland faces significant wastewater management challenges, including the inflow of stormwater into the wastewater system, which results in capacity exceedance and wet weather overflows. Map 12.2 of the plan identifies the Central Interceptor scheme as a critical infrastructure network in the Auckland region.

### **3.6.3 Water and Sanitary Services Assessment**

In 2004/05, Water and Sanitary Services Assessments (WASSA) were undertaken for all the water and wastewater schemes across the region, as a requirement of the Local Government Act 2002. The assessments identified key issues and risks pertaining to each scheme, which were used to guide maintenance programmes and long-term planning.

Watercare is currently working with the relevant departments of Auckland Council to coordinate and undertake a full statutory region-wide WASSA assessment by 2015. The analysis work will be completed after 2012, following the adoption of the Auckland Plan and the development and implementation of region-wide policies. The results will be available to guide the capital works planning and budgets for the 2015-25 Long Term Plan (LTP).



## 4.0 Central Interceptor and upgrading the wastewater network

This section describes the wastewater network upgrading drivers for the Central Interceptor scheme, namely:

- Providing additional capacity for growth and development across the Auckland Isthmus;
- Duplication of the lower part of the Western Interceptor, particularly the critical Hillsborough Tunnel and Manukau Siphon which are ageing and at risk of failure; and
- Reducing wet weather overflows from the existing wastewater network in the central Auckland Isthmus area.

These key drivers are discussed below.

### 4.1 Additional capacity for growth and development

The Auckland Plan anticipates an Auckland region population of some 2.2 to 2.5 million people by 2040. In the Auckland Isthmus, population change will be significant. Figures outlining anticipated population change across the Auckland Isthmus are presented below in Figures 4-1 and 4-2. Population forecast data is based on Statistics New Zealand data, projected forward to 2062 using Auckland Council's medium growth projections.

The capacity of the existing network is insufficient to cater for this predicted population growth. Based on current population projections, the capacity of the Orakei Main Sewer will not be able to convey the normal daily wastewater flow in dry weather (dry weather flow) in approximately 15 to 20 years and will require upgrading to accommodate urban growth.

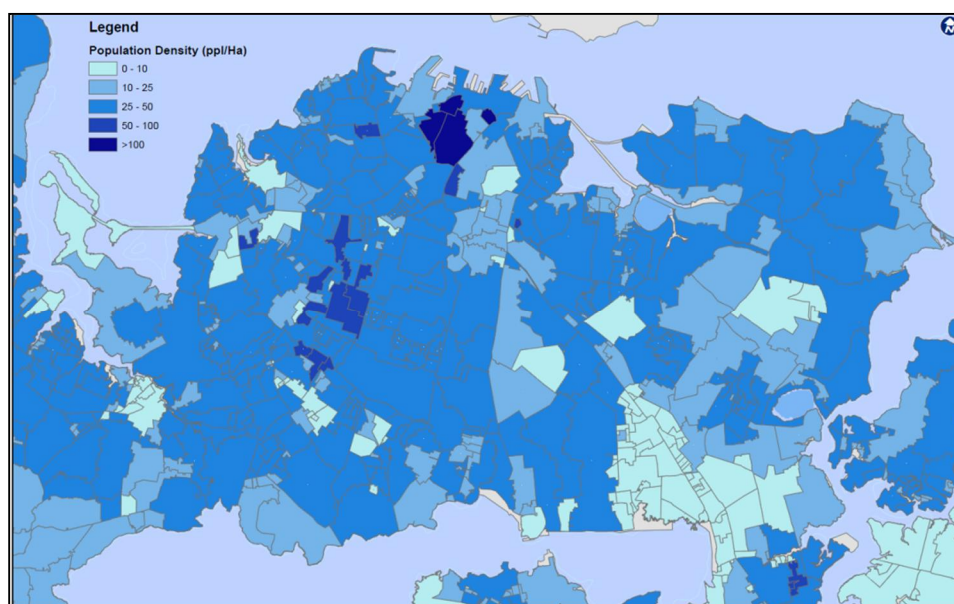
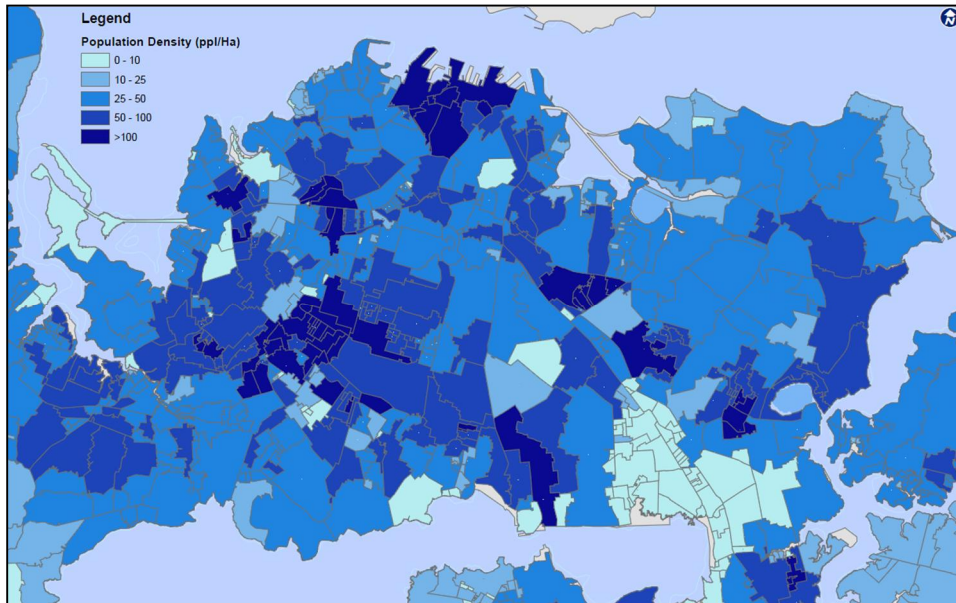


Figure 4-1 Population Density in 2010



**Figure 4-2 Projected Population Density in 2062**

The Central Interceptor scheme has been designed to provide capacity for wastewater conveyance from the network over the 50 year planning horizon and beyond.

#### **4.2 Duplication of the Western Interceptor**

The Western Interceptor (refer Figures 1-1 and 3-2 for location) was constructed in the early 1960s and has been subject to deterioration due to sulphide attack of the concrete. In particular, the lower section of the interceptor, through the Hillsborough Tunnel and the Manukau Siphon, is showing serious signs of deterioration and is estimated to have between 15 - 25 years of life left before it needs to be replaced. The Manukau Siphon itself comprises a single barrel 1550 mm diameter pipe (siphon) that crosses beneath the Manukau Harbour between Hillsborough and Mangere.

The Manukau Siphon and the upstream Hillsborough Tunnel have been identified as critical parts of the Western Interceptor due to the inability to divert flows around these elements for maintenance and risk management, their poor condition and the potential risks to the Manukau Harbour receiving environment in the event of failure.

The Central Interceptor main project works will duplicate the Western Interceptor downstream from the connection at Pump Station 25 in Miranda Reserve and will see flows from this section of the Western Interceptor diverted to the Central Interceptor. This connection will reduce the risk of asset failure and provide Watercare with additional operational flexibility.

#### **4.3 Reducing wastewater overflows**

Overflow from the wastewater network occurs when the capacity of the pipe system is exceeded due to inflow, or as a consequence of a mechanical failure at a pump station or due to a blockage in the network.

To minimise the risk of wastewater backing up in pipes and flowing into streets or people's homes, the wastewater network is designed to overflow in a controlled way through specially constructed discharge points (engineered overflow structures). Overflows from a wastewater network are more likely during wet weather due to higher inflow levels to the wastewater network (i.e. WWO), but may occur also during dry weather if a failure or blockage restricts conveyance capacity (i.e. DWO), or, if as a result of growth, normal dry weather inflows exceed the capacity of the pipes which were not designed to accommodate that level of development.



In modern wastewater networks the risk of overflows is reduced as networks are designed to minimise unwanted water inflows. However, much of the wastewater network within the Auckland Isthmus, including in the Central Interceptor catchment area, was designed and constructed before modern standards were developed and overflows occur frequently.

#### 4.3.1 Wet weather overflows and the combined sewer network

Historically, wastewater networks were designed to collect both wastewater and stormwater flows in a single pipe (termed a combined system – refer conceptual representation in Figure 4-3 below). Much of the Auckland Isthmus is served by a combined sewer system originally constructed in the early 1900s. This had the advantage of requiring only one network of pipes. However, as the network has only a limited capacity to convey storm flows, it regularly overflows during rainfall events. To ensure that these overflows occur in a controlled manner, dedicated engineered overflow structures were constructed at points along the network so that during rainfall events the excess flow could be safely discharged to the local receiving environment.

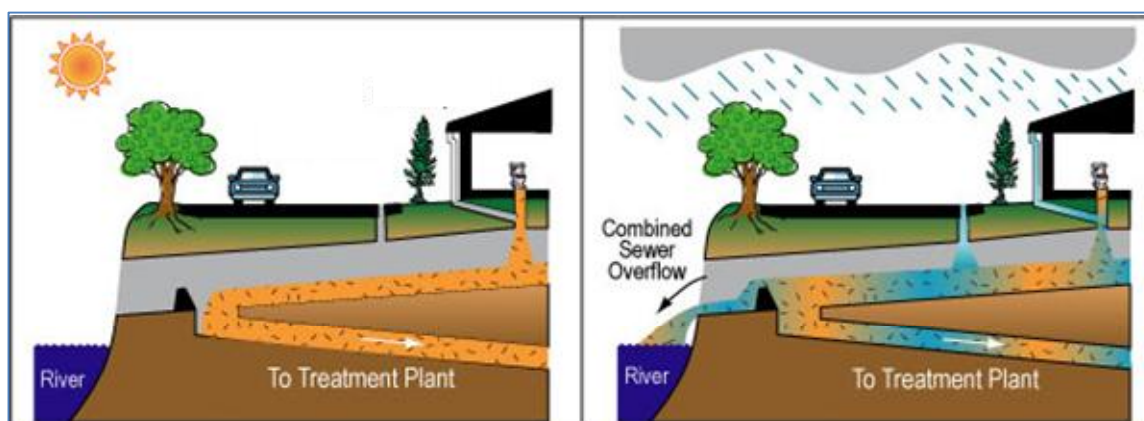


Figure 4-3: Combined wastewater system

Over the last 20 or more years efforts have been made by the former network operators to upgrade the Auckland Isthmus combined sewer system. Much of this work has involved the installation of separate pipes for either stormwater or wastewater. This sewer separation work has proved challenging due to the extent and cost of the works, and has not been completed to a point that addresses the scale of problem in the combined sewer network. Further, where follow-up flow and water quality monitoring has been undertaken in areas where separation works have occurred, problems of wastewater overflow to the separated stormwater system remain. Despite the separation works on the Auckland Isthmus, the wastewater network in the Central Interceptor catchment effectively remains a combined sewer network. This is consistent with international practice in that most wastewater utilities with combined sewer systems have determined that separation is not feasible.

#### 4.3.2 Wet weather overflows and the separated sewer network

Modern wastewater systems are designed to separate wastewater flows from stormwater flows by providing separate pipe networks (Figure 4.4). However, it is not possible to totally eliminate stormwater or groundwater ingress into the pipe system, which occurs as a result of inflow and infiltration respectively. The extent of inflow and infiltration usually depends on the age of the pipes, the pipe material used and the ground conditions. As a result, the addition of stormwater during times of wet weather can cause overflows even in the separated system.



**Figure 4-4: Separated wastewater system**

### **4.3.3 The beneficial effects of the Central Interceptor scheme on overflow reduction**

Within the Central Interceptor catchment area there are some 122 active overflow locations where diluted wastewater discharges to the environment during wet weather. These overflows affect the natural values of Motions Creek, Meola Creek, Oakley Creek, Whau Creek, and the coastal waters around Point Chevalier and the Waterview Inlet, creating potential public health risks for recreational users, and reducing the amenity and cultural values of the waterbodies.

The main cause of these overflows is the inflow of stormwater into the wastewater network. As growth and development has continued across the Isthmus, stormwater inflows have increased, and with ongoing growth and predicted climate change effects, this situation will continue to worsen.

Assessment of the beneficial effects of the Central Interceptor scheme in reducing network overflows has been made using a hydraulic model of the network, developed to assess network performance within the Central Interceptor catchment.

Based on population and land development projections for the year 2062, Watercare's hydraulic modelling of the network indicates that under ideal conditions the Central Interceptor scheme will reduce the average annual volume of wastewater discharging to the environment by more than 90%. Predictions over shorter timeframes show even greater benefit. The modelling predictions show the greatest level of benefit occurring in the Motions and Meola catchments as these two streams received the largest amount of wastewater overflow volume and associated pollution load.

In reality, the level of network performance within the Central Interceptor catchment will differ from the ideal conditions predicted by the hydraulic model, and will differ from year to year, with weather conditions, climate change and catchment development factors all determining the actual level of overflow reduction that will be achieved.

Regardless of any natural variability between years, the Central Interceptor scheme will dramatically reduce overflows and associated pollution loads from a network that currently discharges wastewater to the environment at multiple locations and many times per year.

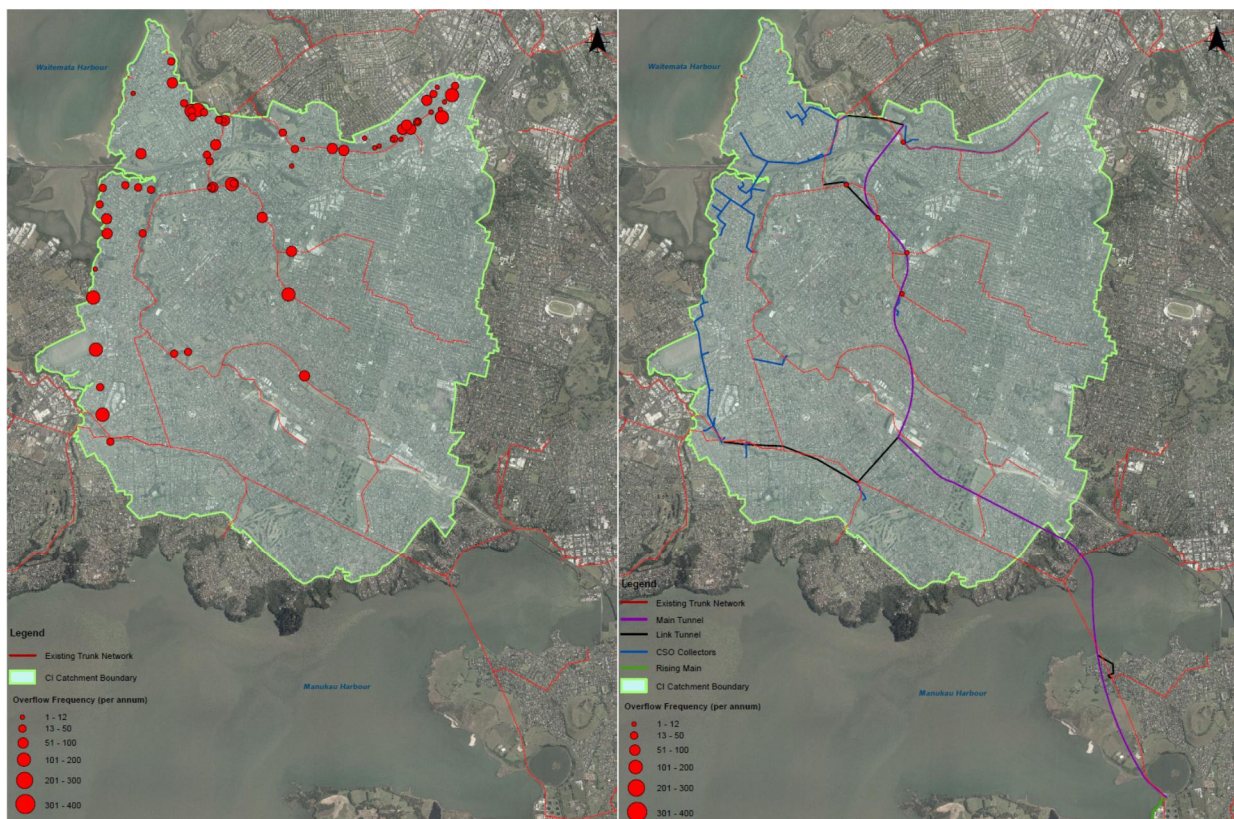
The environmental benefits achieved by the Central Interceptor scheme will be wide reaching, and will see a significant reduction in the public health risk of receiving waters, along with enhancements in ecological, amenity and cultural values. In considering these beneficial effects a range of overflow reduction scenarios have been considered.

Recognising the financial challenges faced in delivering the critical upgrading needs of the network, along with the difficulties of accurately predicting network performance given the complexities of the network and the associated variables of population and climate, Watercare has determined an appropriate network performance target for the Central Interceptor catchment area. This network performance target will achieve an approximate 80% reduction in the average annual wastewater overflow volume discharged from the network in the Central Interceptor catchment, with overflows

occurring during some 6 – 12 storm events in an average year of rainfall. The target is consistent with the acknowledgement in the ARP: ALW that a different management approach to setting overflow reduction targets is required for combined wastewater networks to that of separated wastewater networks.

The network performance target has been developed for the network in the Central Interceptor catchment area as a whole, rather than as a target for individual overflow locations.

Figure 4-5 below graphically indicate the level of wastewater overflow reduction achieved by the Central Interceptor scheme. The figures depict the frequency of overflows in the year 2030 both without (left hand figure) and with (right hand figure) the Central Interceptor scheme, where the red dots indicate overflow frequency at overflow locations in an average year of rainfall.



**Overflow frequency 2030 – without Central Interceptor scheme**

**Overflow frequency 2030 – with Central Interceptor scheme**

**Figure 4-5 Overflow frequency with and without Central Interceptor**

Completion of the Central Interceptor main project works will bring immediate benefit in the Meola Catchment, providing overflow reduction at Watercare’s largest network overflows. Beneficial effects in the Motions, Oakley and Whau catchments, and in the adjacent coastal waters, will be gained on completion of the CSO Collector Sewers.

#### **4.4 Operation of the Central Interceptor**

##### **4.4.1 Overview of operation**

In general, operation of the Central Interceptor can be considered under two main scenarios: dry weather flow conveyance, and wet weather storage and conveyance. These are described below.

#### **4.4.1.1 Dry weather flow conveyance**

Under normal dry weather conditions the Central Interceptor scheme operates to provide conveyance for wastewater intercepted at each of the network connection points. Under these conditions wastewater from the existing network is dropped into the tunnel at the connection points and then conveyed via the tunnel to the Mangere WWTP. At the WWTP, the new Mangere Pump Station pumps the wastewater out of the tunnel and into the plant.

The scheme would operate on this basis for the majority of the time, and while it represents a new inflow point to the plant compared to the current network arrangement, under dry weather conditions it does not alter the amount of wastewater arriving at the plant (i.e. wastewater diverted to the Central Interceptor tunnel would have otherwise flowed to the WWTP via either the Orakei Main Sewer and Eastern Interceptor, and via the Western Interceptor).

#### **4.4.1.2 Wet weather storage and conveyance**

The tunnel has been sized to provide capacity for storage of some 200,000 m<sup>3</sup> of wastewater. Under dry weather conditions very little of the tunnel's overall capacity is used. However, under wet weather conditions the tunnel is used to capture and store wastewater that would otherwise overflow to the environment and then convey it to the pump station and treatment plant. As a rain storm event occurs the tunnel gradually starts to fill, and depending on the duration and intensity of the storm, the remaining capacity reduces until the tunnel becomes full. As the tunnel approaches its full capacity, inlet control gates at selected connection points will close and excess inflows will overflow to the environment via new and existing engineered overflow structures. As the storm event finishes, the wastewater in the tunnel will slowly drop as the WWTP processes the stored wastewater.

#### **4.4.2 Interaction between the tunnel and the treatment plant**

The interaction between the tunnel and the Mangere WWTP has been a key design consideration, as performance of the plant is directly affected by the amount and rate of wastewater arriving for treatment. This interaction will be managed by the new Mangere Pump Station, which will control the delivery of flow from the tunnel into the plant. The treatment plant resource consents set performance requirements for the quality and average daily and annual quantities of effluent discharged to the Manukau Harbour. Storage provided in the tunnel allows for management of peak flows into Mangere WWTP during wet weather conditions and the pump station has been designed so that the rate of pumping is controlled, therefore the ability of the plant to operate within consent limits is not affected.

#### **4.5 Future Mangere Wastewater Treatment Plant upgrades**

A programme of staged upgrading of the Mangere WWTP has been developed reflecting Auckland's future wastewater treatment needs. The programme takes into account population growth projections and future upgrading of the Watercare wastewater network. In addition to the Central Interceptor scheme, Watercare is also evaluating a future "Northern Interceptor", which will eventually see flow from the northern most areas currently serviced by the Western Interceptor and treated at the Mangere WWTP being diverted to the Rosedale WWTP.

Previous upgrading of the Mangere WWTP completed in the early 2000s envisaged that a subsequent staged upgrade of the plant would occur in the mid 2010s. These planned upgrading works will continue to enhance treatment process at the plant.

In addition to these upgrade works, provision is also being made for enhancing the level of treatment for the high flows encountered during wet weather. A new wet weather treatment facility will be constructed in the area adjacent to the proposed Central Interceptor Mangere Pump Station, which will treat WWTP flows prior to UV disinfection and discharge. This upgrading work is currently programmed to occur in advance of the Central Interceptor main project works being completed.

These upgrade works do not form part of the resource consents that are currently being sought for the Central Interceptor scheme and are described to provide context only.

#### **4.6 Other future wastewater network upgrades**

The Central Interceptor scheme provides the opportunity for Watercare to consider future upgrading needs for the wider wastewater network. As noted above, a key area of network upgrading currently being evaluated by Watercare is the diversion of flow from the top end of the Western Interceptor to a new Northern Interceptor and the Rosedale Plant. This would reduce the population load on the Mangere WWTP.

As noted, provision has also been made in the design of the Central Interceptor scheme for the possible future extension of the tunnel into the CBD to provide additional capacity and to address overflows in other parts of the network.

Other network upgrades will continue to occur across the city as part of Watercare's normal management of the wastewater network.



## 5.0 Central Interceptor – main project works description

### 5.1 Overview of main project works

The Central Interceptor main project works involve the construction, commissioning, operation and maintenance of a bulk wastewater interceptor and associated activities. The works, shown on Figure 1-1, incorporate the following key features:

- A new sewer tunnel between Western Springs and the Mangere WWTP – approximately 13 km in length and between about 22 to 110 m (current design) below the ground surface (shown as the purple line on Figure 1-1).
- Three link sewer tunnels and a smaller trenched link sewer pipe connecting the main tunnel and existing sewers (shown as black lines on Figure 1-1):
  - Link Sewer 1 between Motions Road and the main tunnel at Western Springs: approximately 1 km long and up to about 28 m deep;
  - Link Sewer 2 between Rawalpindi Reserve and the main tunnel at Mount Albert War Memorial Reserve: approximately 1 km length, and up to about 43 m deep;
  - Link Sewer 3 between existing Pump Station 25 (Miranda Reserve) and the main tunnel at May Road: approximately 3 km long, and up to about 85 m deep;
  - Link Sewer 4, connecting the local network from Witla Court to the main tunnel at Kiwi Esplanade: approximately 0.6 km long, and comprising a small pipeline about 400 mm diameter, and buried up to about 3 m deep.
- Connections from the main tunnel and link sewers to the existing sewer network.
- Associated structures at the connection points, including access shafts, drop shafts, flow control structures, grit traps, air vents and air treatment facilities.
- Replacement/upgrading of overflow discharge structures in nearby watercourses at seven sites.
- A new pump station at the Mangere WWTP to pump wastewater from the tunnel to the plant.
- Other associated works at and in the vicinity of the Mangere WWTP, including an air treatment facility, a rising main to connect to the plant and an emergency pressure relief structure to enable the safe discharge of flows in the extreme scenario that pump station failure occurs and tunnel storage capacity is exceeded.

These key features are described below, including typical schematics.

The project has been developed to a concept design stage. As the project moves through the detailed design process and as construction methodology is confirmed, it is likely that some details will change. All figures and dimensions provided are approximate and will be confirmed during the detailed design process.

### 5.2 Proposed tunnel alignment and key features

#### 5.2.1 Design concept

The overall concept proposed for the main project works is a main tunnel that intercepts dry and wet weather flows from the wastewater network between Western Springs and Mangere Bridge. The main tunnel will convey the flows by gravity to the Mangere WWTP where a pump station will then convey the wastewater via rising mains to be treated at the WWTP. Link sewers and local pipelines will connect the existing network to the main tunnel at key locations.

There are 19 construction sites along the main tunnel and link tunnel alignments. These sites are located where connections to the existing or proposed network will occur, where a construction base

is required for tunnel construction, and/or where permanent access is required for maintenance/inspection purposes. Most sites are required for all three purposes.

The existing wastewater network is shown on Figure 1-1. Connections will be made to the existing network at the following sites. These connections are shown on the drawings in Part C.

**Table 5-1 Connections to be made to existing sewers**

Connection Point	Existing Sewer
Western Springs	Branch 7 Sewer, local reticulation sewers
Mount Albert War Memorial Reserve	Branch 8 Sewer
Lyon Avenue	Edendale Branch Sewer
Haverstock Road	Branch 8 Sewer, local reticulation sewers
Walmsley Park	Branch 9 Sewer, local reticulation sewer
May Road	Branch 9A Sewer, local reticulation sewers
Keith Hay Park	Branch 9 and 9B Sewers
PS 23 (Frederick Street)	Onehunga Branch Sewer, local reticulation sewers
Witla Court (Mangere Bridge)	Western Interceptor/Mangere Bridge Branch Sewer
Motions Road	Orakei Main Sewer, local reticulation sewers
Rawalpindi Reserve	Orakei Main Sewer, Branch 8, local reticulation sewers
Norgrove Avenue	Branch 8 Sewer
PS 25 (Miranda Reserve)	Western Interceptor/Titirangi Diversion Branch Sewer, local reticulation sewers
Miranda Reserve	(Proposed) CSO Collector Sewer CC7
Whitney Street	Avondale Diversion Sewer
Haycock Avenue	Western Interceptor, Lynfield Branch Sewer

The key design characteristics of the main project works are summarised in the sections below.

### 5.2.1.1 Size and shape

A range of tunnel sizes have been considered for the main tunnel and link sewer tunnels, taking account of hydraulic, operational and economic factors. An internal diameter of 4.5 m is currently proposed for the main tunnel to address future wastewater conveyance capacity needs and provide sufficient storage for an appropriate level of overflow mitigation. The final finished diameter of the main tunnel will be determined by later detailed design analyses and the selected construction method. The proposed designations, the associated resource consent applications and this AEE are therefore based on construction of a tunnel with an internal diameter of between 3.5 m and 5 m. A circular shape is likely with the anticipated construction methods and has been adopted for the main tunnel in the concept design.

An internal diameter of 2.4 m is currently proposed for the link sewer tunnels 1, 2, and 3. A portion of Link Sewer 3 (from WS2 (May Road) to L3S5 (Haycock Avenue)) may be constructed using the same TBM as the main tunnel at May Road, with the remaining section (L3S5 (Haycock Avenue) to L3S1 (PS 25)) being 2.4 m diameter. As with the main tunnel, further design and construction detailing may result in different final tunnel diameters being selected. The proposed designations, the associated

resource consent applications and this AEE are therefore based on construction of link sewer tunnels with an internal diameter of somewhere between 1.5 m and 3.5 m for the link tunnels 1, 2, and 3, and 1.5 m and 5 m for LS 3 between May Road and Haycock Avenue.

The gradient proposed for the main tunnel in the concept design is 1 in 800 from Western Springs to May Road and 1 in 1000 from May Road to Mangere WWTP. The gradient of the link sewer tunnels varies. Link Sewer 1 is proposed in the concept design to be 1 in 500, Link Sewer 2 1 in 750, and Link Sewer 3 1 in 1000.

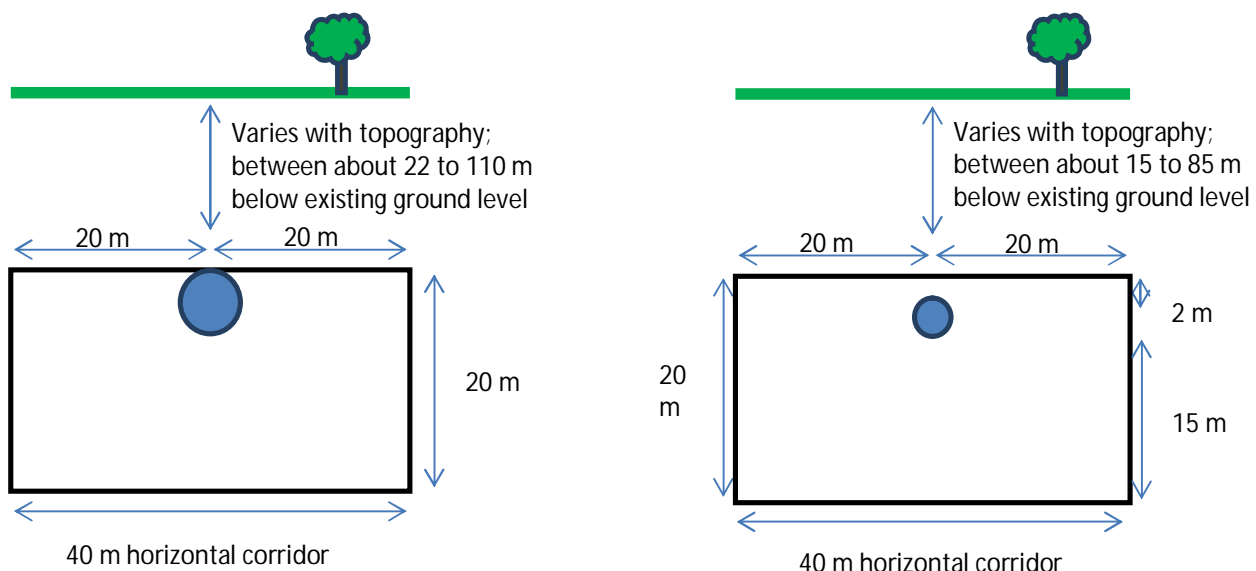
### 5.2.1.2 Liner

Both the main tunnel and the link tunnels will be fully lined. A gasketed, precast concrete segment lining system is the most likely option for the main tunnel. This full-perimeter lining system, installed within the TBM as it moves forward in the main tunnel, will support the ground during construction, minimise groundwater inflows, and maintain the safety of the excavation. Additional corrosion protection will also be installed at particular points where long term corrosion is anticipated to be an issue.

The link sewers are proposed to consist of precast reinforced concrete jacking pipe, with the section of Link Sewer 3 from Haycock Ave (L3S5) to May Rd (WS2) to have a segmental lining, as for the main tunnel.

### 5.2.1.3 Tunnel depth

Drawings AEE-MAIN-20, AEE-MAIN-21, and AEE-MAIN-22 in Part C show a long section of the main tunnel and link tunnels. Vertically, the main tunnel will be located within a 20 m high corridor, with the level of the vertical corridor varying along the alignment due to the required hydraulic grade of the tunnel and the topography of the land above. The main tunnel vertical corridor extends approximately from the top of the tunnel location shown on the long section to 15 m below the bottom of the tunnel. At the Western Springs site the vertical corridor extends from approximately -9m RL to -29m RL, while at the Mangere Pump Station site it extends from approximately -23m RL to -43m RL. Link Sewers 1, 2 and 3 will be located within a 20 m vertical corridor that extends approximately from 2m above the top of the tunnel location shown on the long section to 15 m below the bottom of the tunnel. This is illustrated generally below in Figure 5-1.



Main tunnel vertical and horizontal corridor

Link tunnels vertical and horizontal corridor

**Figure 5-1 Schematic showing main tunnel and link tunnel vertical and horizontal corridors**



The final level of the tunnels will be determined by the geological conditions along the alignment, the selected construction method, and the required hydraulic grade.

Based on the current concept design the depth (to tunnel invert) below ground level ranges from 27 m towards its northern end, to 110 metres under Hillsborough Road, to around 33 m at the Mangere WWTP. The link sewers range in depth up to around 85 m.

### 5.2.2 Tunnel horizontal alignment

The tunnel alignment and horizontal corridor is shown on Figure 1-1 and Drawings AEE-MAIN-25 to AEE-MAIN-33 in the drawing set in Part C. To allow for future design optimisations and flexibility, the final location of the main tunnel and link tunnels is to be within a corridor 40 m wide, centred on the alignment shown in Figure 1-1 and Drawings AEE-MAIN-25 to AEE-MAIN-33 (i.e. within 20 m either side of the centre-line shown). This is illustrated generally above in Figure 5-1.

In summary, the alignment for the main tunnel is from Western Springs in the north, at depth under the suburbs of Mount Albert and Mount Roskill, under the Manukau Harbour and under Mangere Bridge and Ambury Park to the Mangere WWTP.

Features of the alignment of the main tunnel are summarised in Table 5-2 below.

**Table 5-2: Main tunnel alignment features**

<b>Main Tunnel</b>				
<b>Tunnel section</b>	<b>Between sites</b>	<b>Summary of alignment</b>	<b>Approx. length</b>	<b>Predominant land uses, key sites above tunnel alignment</b>
MT1	Western Springs (WS1) to Mount Albert War Memorial Reserve (AS1)	From Western Springs Park to Mount Albert War Memorial Reserve, off New North Road.	1.6 km	Under MOTAT, SH16, Chamberlain Park Golf Course, western rail line and residential area of Mount Albert.
	Mount Albert War Memorial Reserve (AS1) to Lyon Avenue (AS2)	From Mount Albert War Memorial Reserve off New North Road to site at Roy Clements Treeway adjacent to Mount Albert Grammar.	0.8 km	Under residential area of Mount Albert.
	Lyon Avenue (AS2) to Haverstock Road (AS3)	From site at Roy Clements Treeway adjacent to Mount Albert Grammar to Plant & Food Research site near Haverstock Road.	0.7 km	Under commercial/residential area of Mount Albert.
	Haverstock Road (AS3) to Walmsley Park (AS4)	From Plant & Food Research site near Haverstock Road to eastern end of Walmsley Park.	1.1 km	Under Plant & Food Research site and residential area of Mount Albert.

<b>Main Tunnel</b>				
<b>Tunnel section</b>	<b>Between sites</b>	<b>Summary of alignment</b>	<b>Approx. length</b>	<b>Predominant land uses, key sites above tunnel alignment</b>
	Walmsley Park (AS4) to May Road (WS2)	From eastern end of Walmsley Park to undeveloped commercial property between Roma Road and May Road in Mount Roskill.	1.1 km	Under residential area of Sandringham/ Mount Roskill, War Memorial Park, Wesley Intermediate School, SH 20, Stoddard Road commercial area and future Avondale-Southdown rail corridor.
MT2	May Road (WS2) to Keith Hay Park (AS5)	From undeveloped commercial property between Roma Road and May Road in Mount Roskill to eastern end of Keith Hay Park in Mount Roskill.	1.6 km	Under commercial and residential area of Mount Roskill, Akarana Golf Club and Keith Hay Park.
	Keith Hay Park (AS5) to PS 23 (AS6)	From the eastern end of Keith Hay Park in Mount Roskill to the site of existing Watercare PS 23 off Frederick St, fronting onto coastal edge of Hillsborough Bay.	1.9 km	Under residential area of Hillsborough.
	PS 23 (AS6) to Kiwi Esplanade (AS7)	From Frederick St in Hillsborough under the Manukau Harbour to Kiwi Esplanade Reserve.	1.6 km	Under Manukau Harbour.
	Kiwi Esplanade (AS7) to Mangere Pump Station (WS3)	From Kiwi Esplanade Reserve to site of proposed Mangere Pump Station at northern end of Mangere WWTP.	2.5 km	Under residential area of Mangere Bridge and Ambury Farm Park.

Features of the link tunnel alignments are summarised in the table below.

**Table 5-3: Link sewer tunnels alignment features**

<b>Link Sewer Tunnels</b>				
<b>Tunnel section</b>	<b>Between sites</b>	<b>Summary of alignment</b>	<b>Approx. length</b>	<b>Predominant land uses, key sites above tunnel alignment</b>
LS1	Motions Road to Western Springs Depot	From grassed area on Motions Road east under Auckland Zoo and Western Springs Park to Western Springs Depot.	0.6 km	Under Western Springs Park and Auckland Zoo.
	Western Springs Depot to Western	From Western Springs Depot adjacent to Western Springs	0.4 km	Under Stadium Road and Western Springs Park

<b>Link Sewer Tunnels</b>				
<b>Tunnel section</b>	<b>Between sites</b>	<b>Summary of alignment</b>	<b>Approx. length</b>	<b>Predominant land uses, key sites above tunnel alignment</b>
	Springs	Stadium east under Stadium Road to northern end of Western Springs Park playing fields.		playing fields.
LS2	Rawalpindi Reserve to Norgrove Ave	From Rawalpindi Reserve east to Norgrove Ave.	0.3 km	Under edge of Chamberlain Park Golf Course.
	Norgrove Ave to Mount Albert War Memorial Reserve	From northern end of Norgrove Ave south east to Mount Albert War Memorial Reserve on New North Road.	0.7 km	Under residential area of Mount Albert.
LS3	PS 25 to Miranda Reserve	From PS 25 at the western end of Miranda Reserve east to the eastern end of Miranda Reserve.	0.3 km	Under Miranda Reserve.
	Miranda Reserve to Whitney St	From eastern end of Miranda Reserve east to Whitney St.	0.6 km	Under residential area of New Windsor.
	Whitney St to Dundale Ave	From residential/ retail site at Whitney St east to Dundale Ave.	0.6 km	Under residential area of New Windsor.
	Dundale Ave to Haycock Ave	From grassed area of road reserve on Dundale Ave south east to Haycock Ave.	0.7 km	Under residential area of New Windsor.
	Haycock Ave to May Road	From residential site on Haycock Ave north east to undeveloped commercial property at May Road in Mount Roskill.	0.9 km	Under residential area of Mount Roskill and Nirvana Park.

### 5.3 Link Sewer 4

Link Sewer 4 comprises a smaller diameter pipeline connection between the local connection to the Western Interceptor at Witla Court in Mangere Bridge to the drop structure at Kiwi Esplanade Reserve. This connection will comprise an approximately 400 mm diameter pipeline laid in an excavated trench along local streets to the drop structure site. The approximate length of the pipeline is 0.6 km. The alignment starts at Witla Court and follows Muir Avenue and Yorkton Rise and crosses Kiwi Esplanade Reserve to the Kiwi Esplanade shaft. This is shown on Drawing AEE-MAIN-31. The horizontal corridor for Link Sewer 4 is the width of the road reserve.

### 5.4 Typical facilities at construction sites

The following sections set out a general description of the types of permanent features and facilities to be constructed at the construction sites. The facilities to be constructed will differ from site to site. For details on the facilities to be constructed at each individual site refer to the site specific assessments contained in Part B and the drawings in the A3 drawing set (Part C). Typical

schematics and photos of many of the features are provided below for illustrative purposes, although the final design of the structures may differ and will be determined during detailed design.

#### **5.4.1 Access shafts and drop shafts**

The Central Interceptor main project works have been designed, as far as possible, to minimise operation and maintenance requirements. Permanent access shafts are required and these have been provided at the site of each connection point and at tunnel junctions for inspection and maintenance access. Where connections are made to the tunnels, wastewater inflows will need to drop over significant depths, releasing energy. Suitably designed drop structures are required to avoid potential issues associated with this release of energy such as structural damage, the generation of air and hydraulic turbulence and odour generation.

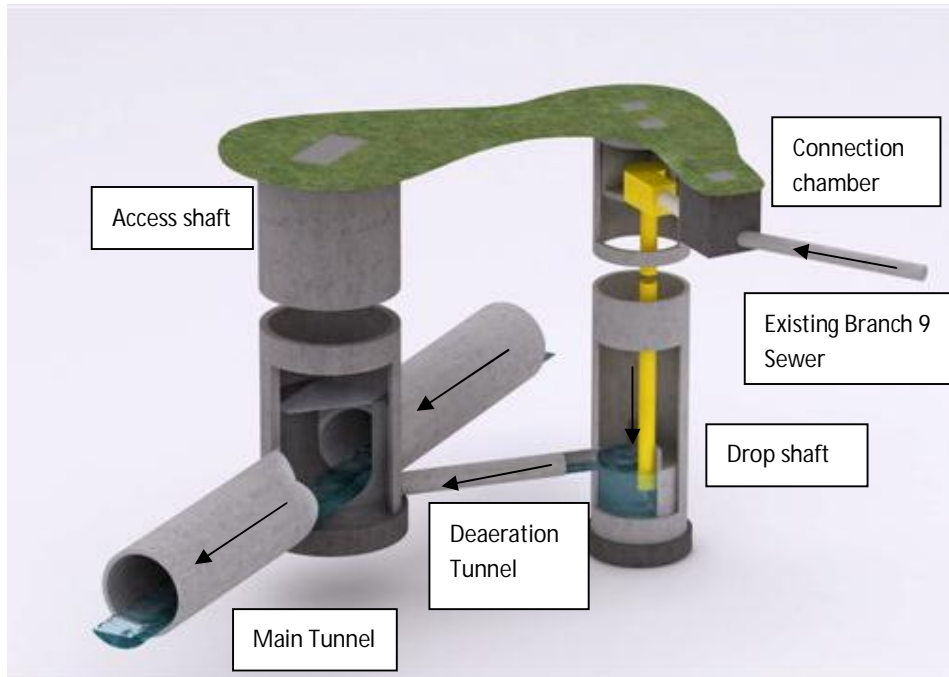
At the main tunnel sites, separate access shafts and drop shafts have been allowed for with an interconnecting deaeration tunnel as shown below. The link sewer sites will have combined access and drop shafts. The permanent access shafts will provide access to the tunnels and will generally be finished at ground level. At PS 23 (Frederick Street) and Kiwi Esplanade shaft finished levels will need to be raised up to 1.5 to 3 m above ground level in order to be above the maximum hydraulic level when the main tunnel fills to prevent overflow at these locations. Other configurations may be considered during detailed design.

Temporary access shafts will be required where the tunnel construction machinery (the TBM or MTBM) is launched or retrieved. The temporary shafts will range in size and be somewhat bigger than the permanent shafts, particularly at the primary sites (refer Section 6.4) and will be filled in and lined as required to form the permanent shafts.

Drop shafts are proposed for most sites. Several options for drop structures have been assessed. The preferred type of drop shaft is the scroll vortex with plunge pool, similar to the type used on Project Hobson. The vortex drop shaft operates by setting up a vortex in the flow, resulting in flow spiralling smoothly down the side walls of the drop structure to the base rather than simply plunging to the bottom.

The diameter of the drop shafts varies depending on the incoming flows. They will generally be finished at ground level, apart from at PS 23 (Frederick Street) and Kiwi Esplanade where they will be raised as described for the access shafts. Drop shafts will be constructed of insitu concrete and one or more access covers will be provided for man and equipment access, including a hatch directly above the vortex to allow inspection. Access hatches will be designed to prevent unauthorised entry.

The schematic below shows, as an example, an indicative arrangement for the Walmsley Park site.



**Figure 5-2 Indicative arrangement of access shaft, drop shaft, and deaeration tunnel (Walmsley Park)**

#### 5.4.2 Deaeration tunnels

Deaeration tunnels have been included at the main tunnel drop shaft locations. The deaeration tunnel connects the drop shaft to the main tunnel (for example, see Figure 5-2 above). These comprise a length of hand driven concrete lined tunnel. These are designed to allow the air drawn down through the drop shaft to escape before it enters the tunnel, reducing the potential for large and potentially damaging air pockets to be formed in the tunnel.

#### 5.4.3 Connection and control chambers

Connection and control chambers are proposed at connection points to provide for inflow connections to the existing system and flow control features including control gates, stop logs or stop gates.

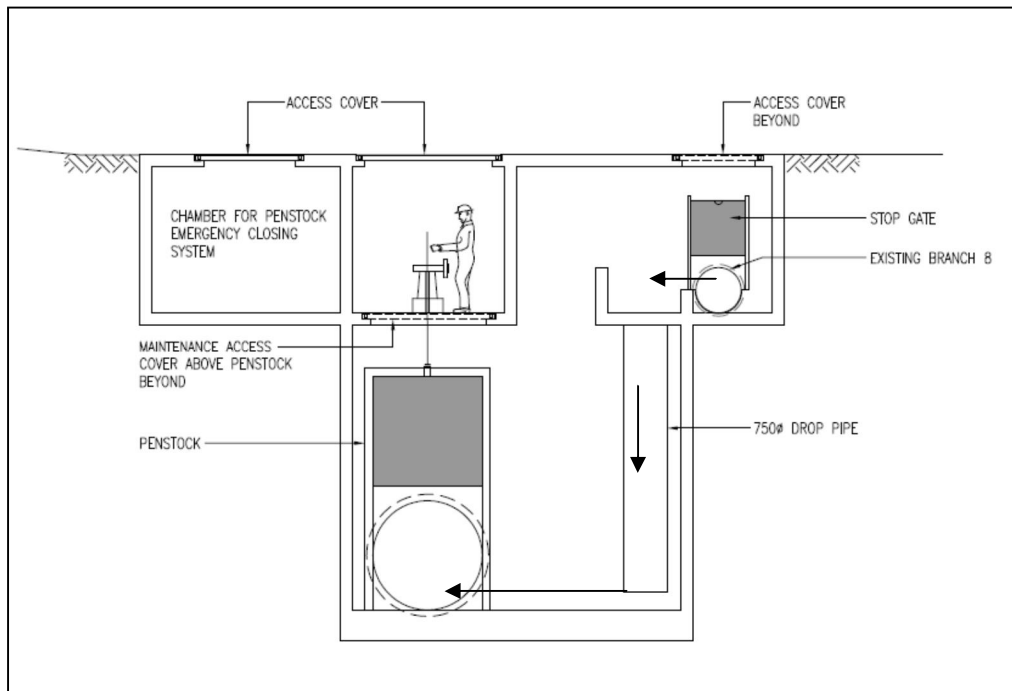
Automated control gates, housed in control chambers at several locations, will control inflows to the Central Interceptor system.

Manually adjustable stop logs will be installed at several locations where it is intended that low flows continue in the existing network whilst higher flows are diverted to the Central Interceptor.

Manually operated stop gates will be installed at several locations to open or close in order to divert flows to or from the Central Interceptor system to carry out maintenance.

Where drops are less than approximately 5 m, such as at some connection points, simple plunging drop pipes are proposed (as shown on Figure 5-3 below).

The control chambers will have dry chambers housing the motor and emergency closing system and a wet chamber housing the control gate and pipelines. The control gates can be closed or partially closed, using the electric motor, to limit flows into the link sewers and main tunnel when the tunnel is close to full, either in extreme weather conditions or in the event of failure of the pump station. Following closing of the gates, existing and new pressure relief points upstream of the gates would overflow (refer Section 5.6). The control systems would respond to level sensors in the tunnel and pumping rates at the pump station to establish the need for limiting inflows. Figure 5-3 below shows an example of an indicative arrangement for a below ground control and connection chamber at Mount Albert War Memorial Reserve.



**Figure 5-3 Indicative arrangement of control and connection chamber at Mount Albert War Memorial Reserve**

#### 5.4.4 Grit traps

Grit from the combined system will be collected at several locations where connections are made to combined sewers. The grit traps will remove larger base load “grit” (such as large pieces of road seal chips, rocks and other debris) from the combined areas, before flows enter the main tunnel. Finer sediments will be passed down the main tunnel and pumped through to the WWTP for removal.

New grit traps will be required at Motions Road, Western Springs and PS 25 (Miranda Reserve) and are based on a standard horizontal flow grit trap with no permanently installed mechanical equipment. The existing grit trap at Rawalpindi Reserve will continue to be used.

The grit traps will be similar to existing Watercare grit traps. The below ground trap comprises two compartments with air tight covers (see Figure 5-4 and 5-5 below). Each of the compartments can be isolated from the main flow to enable cleaning. There will be a flume on the outlet to control flow velocities through the grit trap and a sump to store collected grit. The grit traps will have manually installed stop gates to allow isolation of either side. The chamber will be maintained under negative air pressure to reduce the potential for odour during normal operation.

The grit traps will require periodic cleaning to remove accumulated grit. Cleaning will occur in the same manner as for existing Watercare grit traps by the use of a mobile crane with a grab and sucker truck.

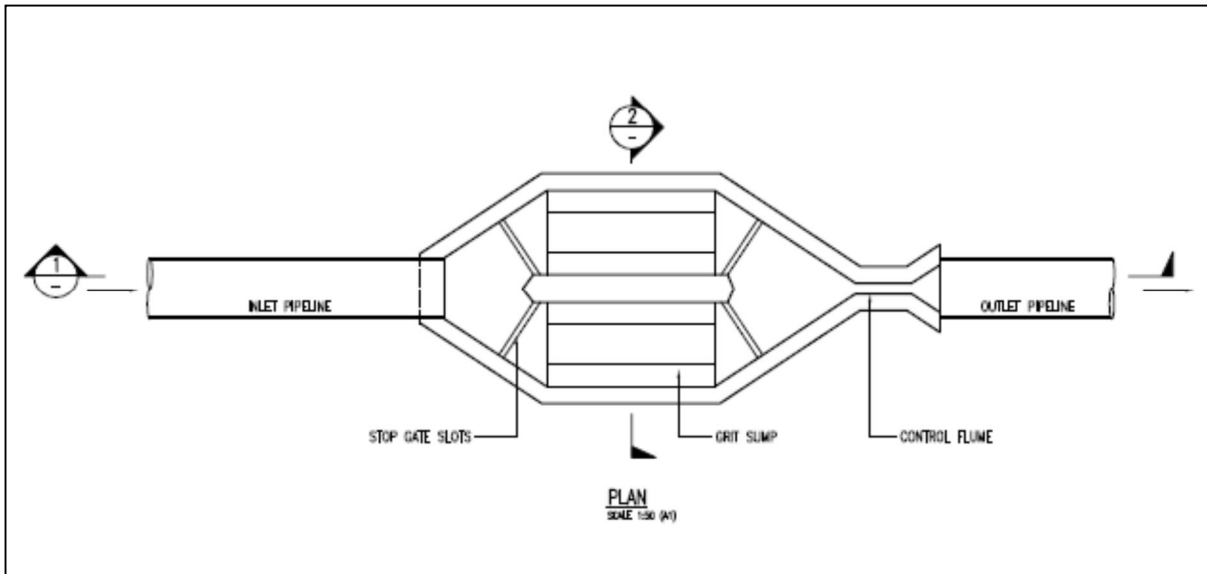


Figure 5-4 Typical grit trap arrangement

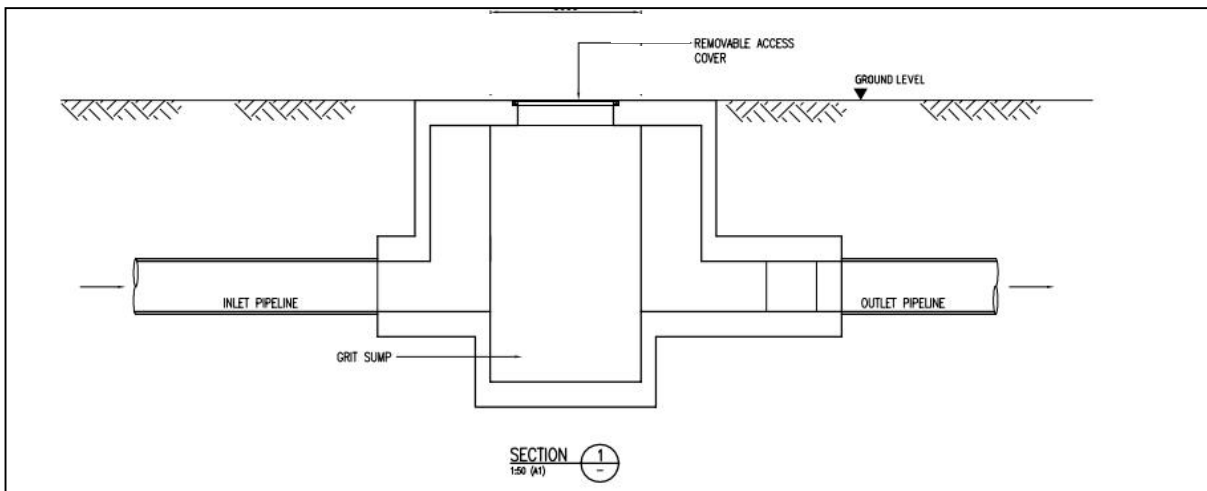


Figure 5-5 Typical grit trap section

## 5.5 Air flow management

### 5.5.1 Overview

The following sections describe the proposed air flow and odour management strategy.

The air flow management strategy has included consideration of the following operational scenarios:

1. Normal dry weather flow conditions. Wastewater flows are simply conveyed to the Mangere WWTP. The tunnel is not operating in storage mode.
2. Wet weather flow conditions when flows are higher and overflows from the system are captured and diverted to the tunnel but the tunnel is not operating in storage mode (i.e. peak flows have not exceeded the capacity of the Mangere WWTP).
3. Wet weather flow conditions as above but peak flows are greater than the capacity of the Mangere WWTP and the tunnel is operating in storage mode, filling from the downstream end of the tunnel at Mangere.

4. Very large storm events (greater than a 2 year return period) when the tunnel goes into storage mode and fills rapidly, creating an air pocket between the filled downstream end and a surcharged upstream section where flows exceed the conveyance capacity.

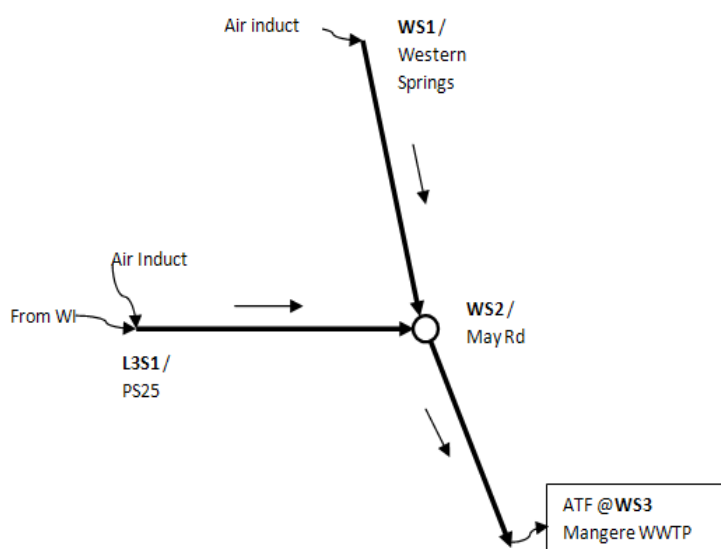
The tunnel will operate under scenarios 1 and 2 for about 95-98% of the time (with variation depending on how much rainfall occurs in the year). Scenario 3 is predicted to occur around 6 to 8 times per year. Scenario 4 is predicted to occur around twice in five years.

The air flow management strategy for Central Interceptor incorporates a combination of primary and secondary air treatment and involves a staged approach to construction of Air Treatment Facilities (ATFs) as described in the following sections. In summary the strategy involves construction of:

- A primary ATF at Mangere Pump Station;
- A secondary ATF at PS 23 (Frederick Street);
- A passive air treatment filter at Mangere Bridge;
- Additional air treatment facilities at a later stage(s), if determined necessary, at May Road, PS25 (Miranda Reserve), and/or Western Springs.

### 5.5.2 Primary air treatment

A primary ATF will be installed at the Mangere Pump Station site and extraction fans will draw air through the main tunnel and link tunnels for air treatment and discharge. Under normal “dry weather” operating conditions the tunnel will be maintained under negative air pressure, with air being continuously drawn into the tunnel via air intakes and through the connections to the existing sewer network. Air will continue to be extracted, treated and discharged through the primary ATF under normal dry weather conditions and wet weather conditions when the tunnel is not in storage mode (scenarios 1 and 2 described in Section 5.5.1). This is illustrated in Figure 5-6 below. Maintaining negative air pressure throughout the tunnel in these conditions ensures that odours will not be discharged at shaft sites along the tunnel alignment as air will be drawn in but not released. When the tunnel fills under certain wet weather events sufficient to cause the tunnel to operate in storage mode, the air will be blocked from being extracted at the primary ATF and the air flow will reverse, pushing air back up the tunnel and releasing it as the tunnel fills. This will only happen when the wastewater has been very diluted with stormwater.



**Figure 5-6 Primary ventilation with ATF at Mangere**



### **5.5.3 Secondary air treatment**

A secondary ATF is proposed to be installed at PS 23 (Frederick Street), where there have been issues with odour in the past. Wastewater draining to this area also includes a significant amount of industrial flow. The ATF will treat odour at this shaft and will also aid in maintaining a negative air pressure throughout the tunnel. The ATF will continue to ventilate and treat air once the Mangere end of the tunnel fills in a storage condition (operational scenarios 1, 2, and the beginning of 3). Once the tunnel fills to a certain level in the area of the PS 23 site connection, the secondary facility will not operate as air will no longer be able to be extracted.

### **5.5.4 Additional air treatment facilities**

As described in Section 5.5.2, initially a single primary ATF will be installed at the Mangere Pump Station site and air will be conveyed to Mangere for treatment. A secondary ATF will be installed at PS 23 (Frederick Street). If, after a period of operation, Watercare determines that there are odour issues associated with the tunnel operations, then the following staged options will be considered to supplement the odour management:

- Install an additional primary ATF at May Road to extract and treat air from Link Sewer 3 and the tunnel between Western Springs and May Road; or, alternatively the primary ATF at Mangere could be augmented.
- Depending on requirements, a primary/secondary ATF may be installed at PS 25 (Miranda Reserve) to treat air from Link Sewer 3.
- A secondary ATF may be installed at Western Springs to ventilate Link Sewer 1 and the upstream end of the main tunnel.

In order to determine the need for any additional air treatment facilities the following procedures will be implemented:

- Any customer complaints will be assessed, following existing standard practices, including:
  - Confirming that the Central Interceptor is the source of the odour;
  - Determining the operating mode of the Central Interceptor at the time of the complaint to ascertain whether the odour was associated with the tunnel;
- Assessment of the frequency of complaints and whether these have been repeat complaints related to a specific location. If it is determined that air was venting out of the shaft at the time of the complaint, monitoring will be undertaken to determine the frequency and duration of problematic odours.
- If odour issues are significant in terms of frequency and duration, the appropriate treatment system which has been designed for that shaft location will be implemented.

The specific treatment system to be installed will be determined on a case-by-case basis having regard to recent operational experience at other sites and the latest technology which is available at that time if that helps to optimise the performance and/or cost. The time to implement a treatment system will be dependent on the scale of the system and availability. A likely time frame range to implement an air treatment system is 1 to 12 months upon confirmation that action will be taken, though interim temporary measures are also possible.

### **5.5.5 Air intakes**

Air intakes will be installed at a number of shaft sites as part of the air flow management strategy. These control air flows by drawing air in to balance air flows within the system and will be manually adjusted during commissioning and operation of the Central Interceptor. Air intakes have been allowed for at Western Springs, Lyon Avenue, May Road, PS 23 (Frederick Street), PS 25 (Miranda

Reserve) and Haycock Avenue. During operational scenario 3, when air cannot be extracted at the Mangere Pump Station, air may vent out of these intakes.

### 5.5.6 Pressure relief air vents

Infrequently during very large storm events (around twice in 5 years, scenario 4 described in Section 5.5, an air pocket may be created between May Road and Mangere Pump Station. Pressure relief air vents are proposed at PS 23 (Frederick Street) and Kiwi Esplanade to release these air flows. The design and appearance of the structures will be determined as part of the detailed design. At PS 23 the pressure relief air vent is likely to be combined with the ATF air vent, and at Kiwi Esplanade it is proposed to incorporate the pressure relief air vent into a new toilet block structure.

During operational scenario 3, when air cannot be extracted at the Mangere Pump Station, air may vent out of the pressure relief air vents.

### 5.5.7 ATF air vents

Air vents are required to discharge air after it has passed through the air treatment facilities (apart from those using a biofilter) (refer Section 5.5.8). At Western Springs, PS 25 (Miranda Reserve), and PS 23 (Frederick Street), these vents will be incorporated into the ATF building and will extend approximately 1 m high from the top of the building. At May Road, the air vent would be around 8 – 10 m high.

### 5.5.8 Odour treatment

The proposed air flow and odour management strategy includes staged provision of primary and secondary air treatment facilities as described in Section 5.5.2 to 0.

Several odour treatment methodologies have been considered for the Central Interceptor main project works including:

- Biofilters;
- Activated carbon;
- Biotrickling filters;
- Biotrickling filter and activated carbon; and
- Chemical scrubbing.

The final decision on the most appropriate technology will be made during the detailed design stage. Based on the concept design, a biofilter is proposed for air treatment at the Mangere WWTP and biotrickling filter and activated carbon at other primary ATF sites. The concept design proposes activated carbon at the secondary ATF sites. The height of the facilities will depend on the type of technology selected, but will typically range from around 2.5 m high (for a biofilter facility) to 6 m to 8 m (for a biotrickling filter plus activated carbon system). Associated air vents would typically be 6 m to 10 m. Table 5-4 summarises the key dimensions for the proposed ATFs.

**Table 5-4 Air treatment facilities approximate dimensions**

Site	ATF footprint (m)	ATF footprint area (m <sup>2</sup> )	Height (m)
Western Springs (secondary)	30 x 15	450	5
May Road (primary)	70 x 37	2590	8
PS 23 (secondary)	25 x 10	250	5
Mangere PS (primary)	85 x 45	3825	2.5

Site	ATF footprint (m)	ATF footprint area (m <sup>2</sup> )	Height (m)
PS 25 (primary ATF option)	40 x 15	600	8
PS 25 (secondary ATF option)	30 x 15	450	5

Watercare currently operates biofilters successfully at several sites, including at the new major pump station (PS 64) at the downstream end of the Hobson Tunnel. This operates in the same manner as proposed for the Central Interceptor, including a staged implementation of ATFs.

A passive air treatment filter will be installed at the AS7 shaft site at Mangere Bridge. This proposed shaft is the most downstream shaft where air will discharge in tunnel storage mode conditions. This will treat air discharged during operational scenario 3 (when the tunnel is storing wastewater) which will occur approximately 6 to 8 times per year for around 10 to 30 minutes depending on the rate of fill within the tunnel. The air will be pushed through the air filter system as the tunnel fills and will likely be treated using an activated carbon or similar system. This will address air venting from the lower end of the tunnel which will likely be very dilute but will be the oldest air within the tunnel.

### 5.5.9 Air flow management summary

The overall strategy outlined above has been developed and incorporated into the proposed design with input from international experts and has involved a review of similar overseas tunnels. Lessons from Watercare's Hobson Tunnel, which has now been in operation for over three years, have also been incorporated into the design. It is apparent from the review that air management and treatment strategies vary widely and many cases have involved the installation of primary units (to maintain negative pressure during dry weather conditions) with provision for additional air treatment to be installed subsequently if required. More often than not these additional air treatment systems were not installed as odour issues did not occur. However, provision has been made in the design development for incorporation of these elements if required.

### 5.6 Wastewater overflow outlet structures

New or replacement wastewater overflow outlet structures are proposed to be constructed at specified locations (close to or adjacent to existing overflows) upstream of control gates, so that in the event of gates being closed, inflows to the Central Interceptor can be discharged in a controlled manner without causing flooding and damage. The overflows may also discharge if the capacity of the connections is exceeded. It is proposed that some new overflow structures be constructed rather than relying solely on existing overflows at these locations so that the structures:

- are designed on the basis of post Central Interceptor implementation flows;
- have a 100 year design life; and
- are located, where possible, in easier to access locations.

The sites where overflow structures are to be constructed are noted within Table 5-5 below.

**Table 5-5 Proposed overflow structures**

Site	Proposed works	Location
Western Springs CSO Collector Site	Upgrade existing overflow	Into pipe
Mount Albert War Memorial Reserve (AS1)	Existing overflow to be retained and upgraded	Into pipe
Lyon Avenue (AS2)	Remove existing overflow	Into stream

Site	Proposed works	Location
	channel and replace with new culvert/pipe	
Haverstock Road (AS3)	New overflow (adjacent to existing overflow)	Into pipe/stream*
Motions Road (L1S1)	New overflow (x2) (close to an existing overflow)	Into stream
Rawalpindi Reserve (L2S1)	Improve existing overflows	Into stream
Norgrove Avenue (L2S2)	Replace existing overflows	Into stream

\*Stream is currently piped, but work to be undertaken by others may involve daylighting of stream

Generally the structures will comprise a pipeline with a standard culvert outlet structure such as a wing wall located in the stream bank (see Drawing AEE-MAIN-23 in Part C for typical detail). Designs are expected to meet the permitted activity standards for structures in watercourses in the ARP: ALW. Although new overflow structures are proposed, the volume and frequency of discharge at these locations will be significantly reduced. Other overflow structures in the network will remain as they are.

## 5.7 Site access

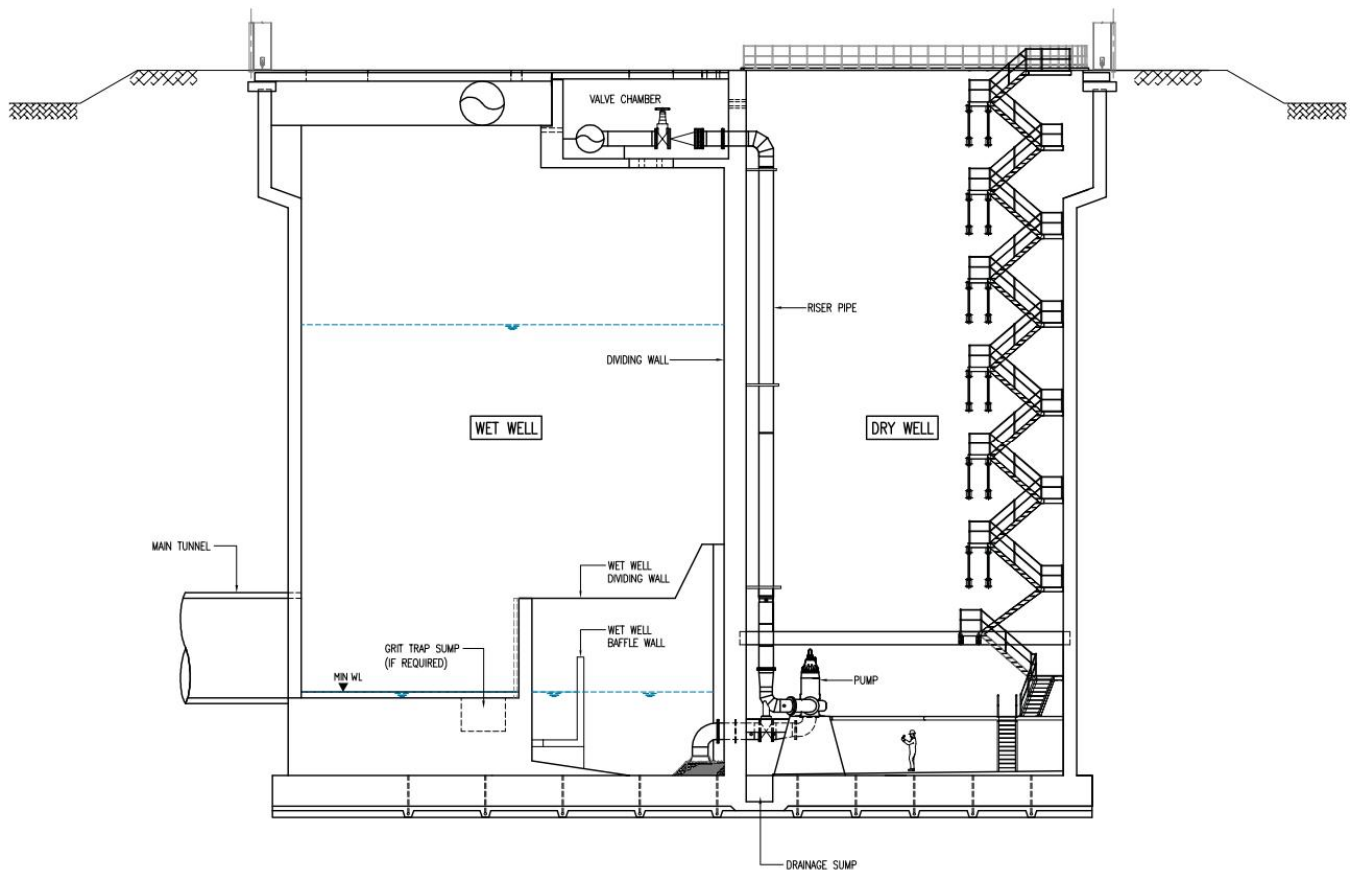
Permanent accessways will be required at the sites to allow for occasional inspection and maintenance access. Generally these will be constructed to form an all-weather trafficable area. Where appropriate and practicable, the use of material such as grass cell paving or similar will be used to enable tie in with surrounding grassed areas and green open space. The final design of permanent access will be influenced by the long term operational requirements for access at each site.

## 5.8 Mangere Pump Station site works

A pump station is required at Mangere WWTP to lift wastewater out of the main tunnel and pump onwards to the inlet of the WWTP via a twin rising main. An emergency pressure relief (EPR) structure is also proposed at the Mangere WWTP site. This would allow for safe and controlled outflows in the event of extreme inflows to the tunnel combined with an emergency event (e.g. pump station failure), thereby providing protection for the tunnel and pump station. The operation of the EPR is described in Section 5.11.5.

The pump station will be of a similar concept to the recently constructed PS 64 (Project Hobson). A wet well/dry well arrangement with a dual wet well configuration housed below a superstructure containing electrical and control equipment and an overhead crane is proposed. Figure 5-7 below shows the twin wet well/dry well arrangement.

The main features of the pump station, rising main, and EPR structure are described in the Mangere Pump Station section of Part B.



**Figure 5-7 Pump station wet well/dry well arrangement**

## 5.9 Stormwater management

The permanent features that remain at the sites following construction will increase the impervious area at the sites. Generally this will result in a minor increase, for example, due to the presence of shaft covers and site accessways. At sites where there is only a minor increase in impervious surface area from the existing situation (i.e. less than an additional 1,000m<sup>2</sup>), storm water runoff will either enter existing overland flows to discharge to current receiving environments, or will be directed to the reticulated stormwater network.

Five sites will involve more significant increases in impervious surface coverage. These sites are Western Springs (WS1), Haverstock Road, May Road, Mangere Pump Station, and PS 25 (Miranda Reserve). Permanent stormwater treatment and indicative layouts for these sites are shown on Drawings SW-MAIN-1 to SW-MAIN-5 (in the A3 drawing set, Part C). Further detail on the indicative stormwater management for each site is provided in Part B of this AEE and in Part D Technical Report K.

The following measures may be used for stormwater treatment for these sites, where appropriate:

- **Proprietary treatment device:** Where space is limited and treatment is required, a device such as an UpFlo filter removes sediment prior to discharge into the reticulated stormwater system or receiving environment.
- **Swale:** Vegetative swales are appropriate for collecting and treating stormwater from non-point source flows from long impermeable surfaces such as access roads. The vegetation removes sediment particles from stormwater by adhesion to the plants and organic material as the water filters through.

- **Wetland:** Wetlands detain flow and allow sediment to settle prior to discharging stormwater. Vegetation in the wetland system also assists in removing a significant proportion of contaminants. Nutrients and dissolved metals in discharged water are reduced through biological uptake. A wetland type system may be constructed at May Road, depending on the outcome of the final design.

All stormwater management devices will be constructed and maintained generally in accordance with Auckland Council's Technical Publication 10 "Design guideline manual stormwater treatment devices" (TP10).

At PS 23 (Frederick Street) there will be a small increase in the existing impervious surface area of the site due to the permanent works. Much of the existing impervious area at the site is due to the site access. As the impervious area at this site will be over 1000m<sup>2</sup>, stormwater from the site will be treated as appropriate with TP10 device(s).

## 5.10 Incorporation of CPTED principles

Crime prevention through environmental design (CPTED) guidelines will be considered both during construction and in the detailed design of the permanent works in parks. The Ministry of Justice's publication *National Guidelines for Crime Prevention through Environmental Design in New Zealand: Part 1: Seven Qualities of Safer Places* has identified the guidelines for incorporating CPTED in development and construction. Below is a summary of the seven national guidelines.

1. **Access: Safe movement and connections:** Places with well-defined routes, spaces and entrances that provide for convenient and safe movement without compromising security.
2. **Surveillance and sightlines: See and be seen:** Places where all publicly accessible spaces are overlooked, and clear sightlines and good lighting provide maximum visibility.
3. **Layout: Clear and logical orientation:** Places laid out to discourage crime, enhance perception of safety and help orientation and way-finding.
4. **Activity mix: Eyes on the street:** Places where the level of human activity is appropriate to the location and creates a reduced risk of crime and a sense of safety at all times by promoting a compatible mix of uses and increased use of public spaces.
5. **Sense of ownership: Showing a space is cared for:** Places that promote a sense of ownership, respect, territorial responsibility and community.
6. **Quality environments:** Well designed, managed and maintained environments: Places that provide a quality environment and are designed with management and maintenance in mind to discourage crime and promote community safety in the present and the future.
7. **Physical protection:** Using active security measures: Places that include necessary, well designed security features and elements.

As an example of how these principles may be incorporated into the proposed works, consideration will be given to the use of graffiti resistant coatings on permanent above ground structures where practical. Regular monitoring and maintenance of construction sites and permanent works sites will help to monitor vandalism of structures and ensure vegetation is maintained.

## 5.11 Central Interceptor main project works operations and maintenance

### 5.11.1 Overview

Watercare operates the wastewater network to safely manage dry and wet weather flows, to reduce and control odours and overflows, and to comply with all legal requirements. The Central Interceptor main project works will provide conveyance for dry and wet weather flows and online storage capacity within the tunnel for storm events. Operations and performance are described earlier in Section 4.4.

Inspection and maintenance is likely to be similar to Watercare's current regime, including regular weekly/fortnightly checks of critical equipment such as the pump station and air treatment facilities and regular but less frequent inspection of control and connection chambers etc. Maintenance requirements would be identified and addressed as required. The main project works have been designed, as far as possible, to minimise operation and maintenance requirements. The access shafts allow for personnel and equipment to gain access for any inspection and maintenance requirements, such as sediment or blockage clearance, tunnel repairs etc.

#### **5.11.2 Shaft sites**

Ongoing access will be required at all shaft sites for inspection and maintenance and permanent vehicle access will be required. This is described in Section 5.7 above and for each site in Part B.

Generally access will be required approximately once per month for activities such as inspecting and maintaining flow controls, inspecting shafts, and checking air intakes. Grit traps will require emptying and cleaning approximately four times per year. This is described in Section 5.4.4 above. At sites where the only permanent feature is an access shaft (e.g. Dundale Avenue), routine access will only be required on an infrequent basis to carry out an inspection, around once every five years, unless maintenance is required. These routine activities will typically involve one vehicle movement each visit.

#### **5.11.3 Air treatment facilities**

Routine inspection and maintenance will be required of air treatment facilities approximately once a week. Other requirements include generator testing and refuelling. Replacement of odour treatment media will be required periodically. Actual requirements will depend on the type of treatment facility selected.

#### **5.11.4 Pump station**

Watercare envisages that normal operation of the Mangere Pump Station would be from a central control room with the ability for local and manual operation as necessary.

The pump station will be split into two sides so that either side can operate independently during maintenance. An overhead gantry crane will lift workers and equipment into and out of the wet well and equipment into and out of the dry well. Regular inspection and maintenance of mechanical and electrical equipment in the dry well would be required and would be accessed by lift and stairs.

#### **5.11.5 Emergency pressure relief**

Provision for an emergency pressure relief (EPR) structure at the Mangere Pump Station must be made to ensure that under emergency situations, pressure can be safely released from the tunnel without causing damage to the pump station or tunnel structures or causing uncontrolled overflows from shafts along the tunnel alignment. The likelihood of the EPR operating is very low, and would occur only where pump station failure coincided with a significant storm event that utilised all available storage in the tunnel.

Watercare's experience indicates that pump station failures are rare and caused primarily by power outage. Of particular note:

- If there were a power loss to the Mangere Pump Station, Watercare's backup generator services enable Watercare to return the pump station to service typically within four hours.
- The Mangere Pump Station will have a dual power supply feed which further minimises the likelihood of pump station failure due to power outage.
- During a 10 year storm event it would take approximately 12 hours for the storage in the tunnel to fill from the start of the storm and the EPR to activate. In dry weather conditions it would take

closer to 48 hours. Within these timeframes, it is likely that Watercare will be able to provide portable generator power before the EPR overflows.

In this regard, the likelihood of the EPR being called into service is very low and would require failure of the Mangere Pump Station over an extended duration (many hours) coinciding with a significant storm event. The likelihood of these events coinciding is extremely small and it is considered that the EPR is unlikely to activate more than say once in every 50 years.



## 6.0 Construction

### 6.1 Introduction

The main tunnel and part of Link Sewer 3 is planned to be constructed using a Tunnel Boring Machine (TBM) with segmental concrete lining. Three primary construction sites will be required along the length of the main tunnel for the launch/retrieval of the TBM. Key construction access sites are also located along the length of the main tunnel to provide access to the TBM during construction.

The link sewer tunnels 1, 2, and 3 are generally expected to be micro tunnelled (as described in Section 6.5.2) and the construction sites along the length of the tunnels will provide for the launch/retrieval of the Micro Tunnel Boring Machine (MTBM). At some construction sites there is also some overlap with the CSO Collector Sewer project, where micro tunnelling works are required for connecting the CSO Collector Sewers to the main project works will occur (CC1 at Motions Road, CC2A at Western Springs and CC6A at PS 25 (Miranda Reserve)). CSO Collector Sewer connections also occur at Haverstock Road, Miranda Reserve and Haycock Avenue. These connections, along with other connection works at construction sites, will be installed by a combination of trenched and trenchless means. Link Sewer 4 will be trenched.

The detailed construction method for the works will not be known until a construction contract has been awarded by Watercare. At that time a detailed Construction Management Plan (CMP) will be prepared to provide additional details on the proposed works and management controls. The following sections broadly set out construction issues and provide a framework for the development of management controls for the construction phase of the main project works.

### 6.2 Construction site types

In general, the project will utilise two types of construction sites, with the nature of construction activities varying during different phases of construction. The following provides an overview of the operations at each type of site and a typical construction sequence. More detailed descriptions of works are presented for each site in Part B.

#### 6.2.1 Primary sites

The tunnel excavation requires work shafts for the launching and retrieving of the TBM, for the delivery of tunnel liner segments and for the removal of the excavated tunnel spoil. Three “primary” construction sites are proposed. These primary construction sites are Western Springs (WS1), May Road (WS2) and Mangere Pump Station (WS3). The Mangere Pump Station site will operate as a launch site and the Western Springs and May Road sites may operate as either launch or retrieval sites depending on the direction of tunnelling. For the purposes of assessment it has been assumed that both will operate as launch sites (which has the potential for greater effects). Construction works at these sites are expected to be in the order of approximately five to six years duration.

These sites will serve as construction bases where site facilities will include site offices, parking, and workshops. Areas will be required for the temporary storage of tunnel liner segments, and spoil. Required construction associated equipment will include cranes or gantries, a wheel wash, water treatment facilities, noise barriers, standby power, and site lighting. Temporary sheds or enclosures will be constructed over the shafts at Western Springs (WS1) and May Road (WS2). Spoil removal from the tunnel would be undertaken from inside these buildings. The enclosure buildings will reduce noise levels at these sites where tunnelling related surface activities will occur at night time.

The construction sequence at the primary sites will typically involve:

- Site establishment;
- Shaft excavations;
- TBM assembly and launch (or retrieval);

- Tunnel excavations, liner placement and spoil removal;
- Shaft permanent works construction; and
- Other permanent construction works, such as grit chambers, control chambers, connection chambers, connecting pipelines, permanent access roads, provision of power supply, and stormwater drainage.

At the Mangere site the pump station wet well, building and fit out will occur, along with construction of the air treatment facility. Air treatment facilities may be constructed at the May Road and Western Springs sites at a later date if necessary.

At the completion of works, site reinstatement will be undertaken which will generally involve activities such as the removal of all plant and equipment, the removal of temporary structures, landscaping and planting.

### **6.2.2 Secondary sites**

A series of secondary construction sites are required along the main tunnel and link tunnel alignments to form connections, drop shafts and access shafts, and for the micro tunnelling construction method proposed for the link tunnels. The range of activities and construction sequencing at these sites will be similar to the activities at the primary sites, however, the sites are smaller and will be active for shorter periods of time, ranging from 6 to 18 months, depending on the scale of works at the site. The length of occupation for construction at the sites will be longer than this (between two and five years), with some periods of time where no active construction works will occur at the sites due to the phasing of construction. Where CSO Collector Sewer connections are made, these works may occur later than the main works at the site.

For the secondary sites on the main tunnel alignment, work will largely be focussed on the construction of drop and access shafts and the other permanent works, such as connection chambers. No bulk tunnel spoil removal activities will occur at these sites. These sites are Lyon Avenue, Haverstock Road, Walmsley Park, PS 23 (Frederick Street), and Kiwi Esplanade. At Mount Albert War Memorial Reserve and Keith Hay Park there will also be micro tunnelled connections and associated activities.

The construction method for the link tunnels is summarised in Section 6.5.2. Works at these sites will be different to the main tunnel, and could involve removal of excavated spoil for the micro tunnelling, along with construction of the permanent works. These sites are Motions Road, Western Springs Depot, Rawalpindi Reserve, Norgrove Avenue, PS 25 (Miranda Reserve), Miranda Reserve, Whitney Street, Dundale Avenue, and Haycock Avenue.

As for the primary sites, at the completion of works, site reinstatement will be undertaken. This will involve activities such as partial filling of shafts, removal of all plant and equipment, removal of temporary structures, landscaping and planting.

### **6.3 Site establishment**

Site establishment works will generally involve the following activities:

- Establishment of erosion and sediment control measures;
- Vegetation removal;
- Services relocations;
- Site levelling and drainage works;
- Formation of construction access and compacting of the site yard;
- Establishment of site buildings, services (water, electricity etc);
- Construction of site perimeter fencing and noise mitigation barriers.

Temporary accessways will be required for access during construction and indicative locations are shown on the site layouts in the A3 drawing set (Part C). Alternative pedestrian accessways will also be provided at some sites where works will affect existing accesses.

## **6.4 Shaft excavations**

Construction shafts are required at each of the primary and secondary construction sites. On completion of the tunnel excavations, shafts will be fitted out to form the permanent lined shafts. In some cases infilling may be required to reduce the size of the temporary shaft down to the permanent shaft diameter.

Shafts of a range of depths and diameters are required and the ground conditions at individual shaft locations will dictate the methods used to construct the shafts. Typically shafts on the main tunnel will range in depth from between around 28-44 m and 79-94 m (depending on the final depth of the tunnel) and in diameter from 25 to 35 m (at primary sites) and 8.5 m to 13 m (at secondary sites). The link sewer shafts range in depth from between around 21-36 m and 46-75 m (depending on the final depth of the tunnels) and in diameter from 5.5 to 10 m.

The shaft at the Mangere site is proposed to be constructed by the diaphragm wall technique, given the dimensions of the shaft (around 35 m diameter) and the saturated sand ground conditions present. The primary shafts at the Western Springs and May Road sites have little soft ground present and are both expected to be constructed by a combination of grouting and rockbolting in basalt, and rockbolting in East Coast Bays Formation (ECBF) ground conditions. Some form of mesh or shotcrete is likely to be required on the walls for safety reasons.

Construction of the shafts at the secondary sites will use a combination of methods, including steel sheet piling, secant piling, rockbolting/anchoring with mesh/shotcrete, and soldier pile with timber lagging. It may be possible to construct some access shafts with precast segmental caissons, which form the temporary works and also double as the permanent shaft structure. Smaller shafts on micro tunnelled lines may include construction by precast caissons and bored pile casings. These methods are similar to the methods used for other Auckland tunnelling projects in similar ground conditions, including Project Hobson.

For all sites, special attention will be required to managing groundwater inflows and minimising the risk of settlement using appropriate construction methods.

Blasting will not generally be used in construction, but may be required where basalt is found in the shaft excavation. The following sites have been identified as potentially requiring blasting: Western Springs, Mount Albert War Memorial Reserve, Lyon Avenue, Haverstock Road, Walmsley Park, May Road, Kiwi Esplanade, Motions Road and Western Springs Depot. Where no other reasonable alternative exists, controlled blasting techniques will be used. Blasting would occur only during daylight hours and to an approved methodology.

## **6.5 Tunnel construction**

### **6.5.1 Main tunnel construction**

Tunnelling of the main tunnel will be undertaken within a 40 m corridor centred on the alignment shown in Figure 1-1 using a single or pair of TBMs. Photograph 6-1 shows an image of a typical TBM.

The main tunnel is likely to be constructed in two drives:

- MT1: a length of 5.5 km from Western Springs to May Road
  - Likely to be constructed by driving in a southerly direction from Western Springs WS1 to WS2 at May Road then on to Haycock Avenue (L3S5), but may also be tunnelled uphill from WS2 to WS1.

- MT2: a length of 7.8 km from Mangere WWTP to May Road.
  - Likely to be launched from the Mangere WWTP (WS3) and driven uphill to WS2 at May Rd.



**Photograph 6-1 Tunnel Boring Machine used for Project Hobson**

If two TBMs are used, tunnelling of the MT1 and MT2 tunnel drives is likely to occur at more or less the same time, with starting dates staggered by several months. Programme and construction staging will be determined in consultation with the contractor selected to undertake the tunnelling work.

Excavation of the tunnel alignment from Mangere (WS3) to May Road (WS2) is likely to be undertaken using a pressurised face TBM (e.g. Earth Pressure Balance (EPB), slurry TBM) to manage risks associated with ground conditions. This type of machine has recently been successfully used in Auckland in similar ground conditions on both Project Hobson and Rosedale Outfall.

A cutterhead will cut the tunnel profile and excavated material will be transported from the TBM to the shaft using spoil cars, slurry pipes, or a horizontal continuous conveyor belt. Spoil will be removed from the construction shaft via a vertical shaft conveyor or a hoisting system which lifts spoil skips with a crawler or gantry type crane. Several cranes may be required on site at any one time.

The tunnel liner segments are brought into the tunnel via the shaft and transported to the TBM. The segmental precast concrete tunnel liner is brought in by the TBM and progressively placed behind the machine as the TBM moves forward. Tunnel segments will be stored on site, but the manufacture and bulk storage of segments will be at a suitable facility off site.

Approved ground conditioners may be required in order to make excavated material workable and easily removed. Water may also be added to form a “slurry” to aid in cutting.

The EPB TBM maintains a regulated pressure at the face of the excavation. It has the advantage of being able to be operated in “open” (without face pressure) or “closed” (with face pressure) mode depending on the ground conditions. Slurry machines always operate in closed mode. Face pressure is typically applied to stabilise the excavation face in soft ground, or in cohesionless ground that has the potential to flow due to the presence of groundwater. Face pressure can also be applied to balance or partially balance groundwater pressure to prevent or reduce groundwater flows into the excavated face.

Tunnelling operations will occur 24 hours a day 7 days a week. The TBM is expected to advance in the order of 13 to 20 m per day but a conservative average of 12 m per day has been assumed. Actual tunnelling progress will vary from day to day and week to week.

At the end of the tunnel drive the TBM will be retrieved from the shaft, or it may be left in place at Haycock Avenue at the end of the WS2 to L3S5 drive.

### **6.5.2 Link sewers micro tunnelling construction**

The link sewers will likely be constructed using micro tunnelling/pipejacking methods, with the exception of Link Sewer 4 which will be trenched, and Link Sewer 3 between May Road (WS2) and Haycock Avenue (L3S5), which will likely be tunnelled using the same TBM as the main tunnel. The CSO Collector Sewer connections (CC2A at Western Springs, CC1 at Motions Road, and CC6A at PS 25 (Miranda Reserve)) will also likely be constructed by this method.

The micro tunnelling/pipejacking method involves pushing a Micro Tunnel Boring Machine (MTBM) forward from a launch/drive shaft to a reception shaft. At the launch shaft construction site the pipe stockpile, cranes, and any support equipment and stores are located. The reception shaft construction site only needs to provide access for a crane to retrieve the cutter unit or shield.

The MTBM is inserted first, and then pushed forward by hydraulic rams that push off the shaft wall or a reaction pad. At the end of each forward stroke a new pipe is inserted and the process repeated until the cutting unit or shield is retrieved at the reception shaft. Excavated material is transported to the shaft using either spoil cars, a horizontal continuous conveyor belt or as a slurry and removed from the construction shaft via a vertical shaft conveyor or a hoisting system which lifts spoil skips with a crawler or gantry type crane.

If slurry micro tunnelling is undertaken, this involves the addition of water or a bentonite or polymer based mixture at the cutting face to form a slurry. This slurry is pumped from the shaft and requires separation at the surface. If this method is used additional equipment will be required at the launch construction site, including a bentonite mixer and separation plant. The separation plant separates the ground material from the slurry which is then recycled back to the tunnelling face. The separated soil is then deposited in muck bins and loaded onto trucks. The slurry separation system is a "closed loop" and will not require any discharge of water at the construction sites. Unusable slurry will be disposed of to an appropriately authorised facility.

Figure 6-1 shows a typical micro tunnelling arrangement. Photographs 6-2 to 6-5 show a series of photographs from the construction of the South Western Interceptor extension (taken in September 2011). The photographs show the construction site setup (in a road berm in the centre of the road), the lowering of the pipe segment into the shaft, the set up of the pipe segment to be jacked into place, and a single pipe segment.

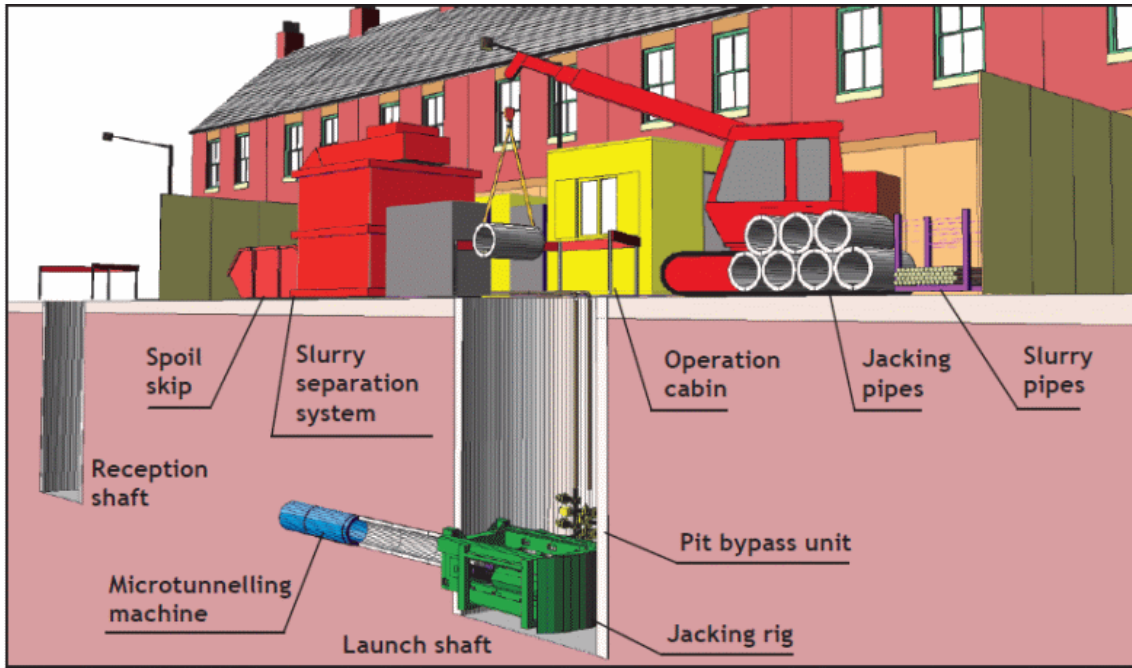


Figure 6-1 Typical micro tunnelling arrangement (source: Iseki Micro tunnelling <http://www.isekimicro.com/micro.html>)



Photograph 6-2 View of construction (launch) site



Photograph 6-3 Pipe segment being lowered into place by crane





**Photograph 6-4 Set up of pipe segment to be jacked into place**



**Photograph 6-5 Single pipe segment**

### **6.5.3 Deaeration tunnels**

The deaeration tunnels, which link the drop shaft to the main tunnel (refer Section 5.4.2), will be constructed using the following possible methods:

- Roadheader (unshielded, or shielded in poor ground);
- Hydraulic excavator with rock mill attachment or similar;
- Digger shield; or
- Hand mining.

Temporary support of these deaeration tunnels will likely consist of rockbolts (or dowels) with steel mesh and/or shotcrete. In areas of poor rockmass quality, the support measures may comprise closely spaced steel sets with timber lagging.

### **6.5.4 Dewatering**

Infiltration of groundwater into the shafts and tunnels is to be primarily controlled through the design and specification of relatively watertight excavation support systems. This reduces water inflows that would otherwise have to be pumped out of the shafts, treated, and disposed of. Some groundwater will need to be removed from the shafts.

Typical groundwater control measures for rock shafts include dewatering and groundwater cut-offs through chemical or permeation grouting and will be used as needed. Groundwater control for excavation through the basalt rock would be accomplished by grouting. The ECBF materials are not expected to require special groundwater controls. Groundwater control methods, if used, will likely be supplemented with other measures such as a sump system to remove groundwater inflows from the excavations and concrete collars to control seepage along the soil/rock contact.

For the pump station shaft at the Mangere WWTP, it is expected that deep well dewatering will be required to dewater the alluvial sediments in advance of excavation.

If tunnelling of MT1 begins at Western Springs and the tunnel is driven downhill, pumps and pipe work will need to be carried along with the TBM to keep the tunnel dewatered and avoid collection of water at the low end of the tunnel.

With the proposed construction method, involving an EPB TBM with gasketed segmental lining installed, groundwater inflows during construction are expected to be in the order of 5 to 30 m<sup>3</sup> per



day in the area of the construction location. This could increase (by a factor of up to 400) where large zones of highly fractured ECBF are encountered for significant lengths of excavation. Careful operation with the EPB TBM in closed mode could reduce flows to nominal amounts or around 5 to 30 m<sup>3</sup> per day local flow as in more typical ground materials. Groundwater inflows during construction for each of the shafts are expected to range between 10 – 150 m<sup>3</sup> per day.

Groundwater will be pumped out of the tunnels at the construction shafts for treatment prior to discharge. Groundwater that does not require treatment will be discharged directly to stormwater drains. Discharge of treated water will be to either stormwater or sewer, depending on quality. The amount and quality of groundwater will vary from site to site and will depend on the nature of the ground and the method of shaft construction.

## **6.6 Connection pipelines**

Connection pipelines, including Link Sewer 4, are required to make connections to the existing sewer network. With the exception of the connection to Branch 9 and 9B from Keith Hay Park (Drawing AEE-MAIN-7.2), these will involve some minor trenching works. These works will use standard trenching practice, such as trench shields, shoring and battering.

The connection sites, at any one location, should be required for a relatively short duration. Connections to the existing network may require work at night during periods of low flow. Where connections are to be trenched in the road, traffic management measures will be implemented (refer Section 6.17.5). Where trenching occurs in close proximity to dwellings, noise mitigation measures, such as the use of mobile screening, will be used where needed.

The connection to Branch 9 and 9B sewers to the north of Keith Hay Park will require micro tunnelling construction sites within the park and adjacent to the SH20 motorway.

## **6.7 Water treatment**

Water used or exposed to any construction process (e.g. wheel wash etc) will be directed to a water treatment facility located on the site. As noted above, groundwater pumped out of the tunnels may also require treatment prior to discharge.

Treatment requirements will be determined by the potential discharge receiving environment. The options are:

- Discharge to the Watercare sewer; or
- Discharge to watercourse or the reticulated stormwater system.

If discharge is to occur to a watercourse or reticulated stormwater, treatment will be undertaken to reduce sediment to acceptable levels for discharge via settlement tanks and if necessary, flocculation. Neutralisation treatment may be required to address pH levels.

## **6.8 Artificial lighting**

As 24 hour operations are proposed at some sites, artificial lighting will be required. Lighting will be designed to minimise effects, such as through consideration of placement, design and screening if necessary.

## **6.9 Erosion and sediment control and stormwater management**

The estimated area and volume of earthworks associated with the main project works is summarised in the table below.

The nature of earthworks required includes the stripping and preparation/contouring of construction sites, shaft and tunnel excavations, excavations for underground permanent works such as chambers, trenching for connection pipework, and site reinstatement.

**Table 6-1: Approximate earthworks areas and volumes**

	<b>Auckland Isthmus area</b>	<b>Manukau area</b>	<b>Coastal Marine Area</b>	<b>Total</b>
<b>Tunnel works</b>				
Approximate volume of excavated material (m <sup>3</sup> )	262,000	58,000	36,000	356,000
<b>Construction site works</b>				
Approximate volume of excavated material (m <sup>3</sup> )	53,000	68,000	-	121,000
Approximate area of works (ha)	6.6	3.5	0.16	10.3

Generally tunnel spoil will be taken off site as it is removed and would not generally be stored in large quantities on site. At the primary sites, spoil would be stored overnight inside the shaft enclosure shed for removal the following day. It may be necessary at times to temporarily stockpile removed spoil on site. As the final construction site layouts have not yet been determined, the potential stockpile locations have yet to be identified. Any stockpiles will be watered, covered or protected as necessary to prevent windblown dust. Management of any stockpiles will be included as part of the CMP.

It is intended that earthworks will be undertaken throughout the calendar year and the consent for earthworks is sought on this basis. Draft erosion and sediment and stormwater control plans have been prepared to manage works at the sites during construction. These are contained in Part B Technical Report K. The works have generally been addressed in two phases:

- The establishment phase of works, when most of the surface disturbance activities will occur, such as site grading and access road establishment; and
- The construction phase, when tunnel construction works will occur at the sites. During this time the construction accessways will be subject to vehicle traffic and some sediment will be generated by construction activities.

In considering appropriate treatment for each site, consideration has been given to TP 90 guidelines, as well as TP 10 guidelines, and appropriate treatment has been proposed, depending on the physical nature of the site, the duration of works, and the activities to be undertaken.

Dust control measures will be implemented should this be required and wheel wash facilities will be established to ensure truck wheels are cleaned before travelling on local roads.

#### **6.10 Spoil disposal sites**

Excavated material which is unable to be reused as part of the project works will be disposed of to an authorised site. The spoil disposal sites will be determined by Watercare or the contractor and do not form part of the current consent applications.

Possible sites for spoil disposal may include other construction sites where cleanfill material is required, existing cleanfill sites, or to landfill for any contaminated material.

#### **6.11 Permanent structures**

Permanent works will include fitting out of the access shafts, drop shafts, manholes, grit traps, and control chambers. This may include partial filling of construction access shafts where required.

Fitting out of below ground permanent works will comprise:

- In situ concrete construction;
- Precast concrete installation;
- Mechanical installation – control gates, air vents;
- Electrical installation – power and control systems;
- Installation of ladders, platforms, stairs, and access covers etc.

#### **6.12 Air treatment facilities**

The construction of the air treatment facilities will be staged as described in earlier in Section 5.5.

Construction will depend on the type of air treatment facilities to be constructed. Generally the construction of the biofilter and biotrickling filter and activated carbon (BTF/AC) air treatment facilities will involve:

- In situ concrete construction;
- Steelwork installation (BTF/AC);
- Precast concrete installation;
- Cladding, roofing and building finishing (BTF/AC);
- Mechanical and process installation – biotrickling filters, activated carbon units etc for BTF/AC and pipes, bark media etc for biofilter;
- Electrical installation – power and control systems;
- Installation of doors, ladders, platforms, stairs, access covers etc (BTF/AC).

#### **6.13 Works in the coastal marine area**

Works will occur in the coastal marine area in three locations. These are:

- The construction of the main tunnel under Manukau Harbour;
- The construction, use and removal of the temporary construction platform, the demolition of PS 23, and the placement of a permanent seawall as part of site reinstatement at PS 23 (Frederick Street); and
- The construction of the emergency pressure relief structure at the Mangere Pump Station.

The construction of the main tunnel under Manukau Harbour will be below the seabed and the tunnelling methodology will be as described in Section 6.5. At the other two sites, erosion and sediment control measures will be employed to manage the effects of these works. Further detail in relation to each site is contained in sections 8 (PS 23) and 10 (Mangere Pump Station) in Part B.

#### **6.14 Works in watercourses**

Works in watercourses will occur at a number of sites, associated with the construction of overflow points and bridges/culverts for site access. The tunnels will be constructed well below any watercourses, and the connection beneath Meola Creek at Haverstock Road will be constructed by trenchless means. It is expected that the design and construction of these works will be managed so as to meet the permitted activity conditions for works in watercourses in the ARP: ALW. Drawing AEE-MAIN-23 in the drawing set shows typical details for the overflow structures in streams.

#### **6.15 Site reinstatement**

Reinstatement at all sites following construction will generally involve replacing what was at the site prior to construction in a like for like manner where appropriate and practicable. At most sites this is

likely to involve a combination of regrassing or repaving, replanting, and replacement of facilities that have been removed (e.g. footpaths, playground, and park furniture). Construction access roads not required for maintenance access will also be removed.

The details of site reinstatement will be developed in discussion with the landowners of the sites. Reinstatement works in parks and reserves will be developed in conjunction with Auckland Council and local boards (or Regional Facilities Auckland at Western Springs). The Landscape and Visual Assessment Report and associated concept plans (Part D Technical Report A) provide potential options as a starting point for discussion. Consideration will be given to Auckland Council aspirations and plans, including those identified in Local Board Plans and the potential for stream naturalisation opportunities in some areas in conjunction with Auckland Council works.

## **6.16 Construction plant and equipment**

Typical construction plant and equipment is expected to include (but not be limited to):

- Site access road establishment machinery;
- TBM or MTBM;
- Temporary workshops and equipment storage;
- Craneage;
- Excavators;
- Concrete trucks;
- Trucks for spoil and other materials;
- Water treatment facilities;
- Slurry separation facilities (where required);
- Wheel wash;
- Generators and transformers;
- Ventilation plant.

Indicative layouts are shown for the primary construction sites on the drawings in the drawing set, Part C. A typical layout of equipment for the micro tunnelling sites is shown on Drawing AEE-MAIN-24 in the drawing set. Final layouts within the site boundaries will be determined in consultation with the contractor.

## **6.17 Construction management**

### **6.17.1 Construction programme and staging**

The main construction programme for the Central Interceptor project is currently scheduled to occur between 2017 and 2023, with the CSO Collector Sewer construction extending out to 2027. An indicative construction programme is set out below for the main project works, however the timing and staging of works may change as the project proceeds and will depend on the construction methodology adopted.

Construction of the main tunnel and link sewers may extend over five to six years, with the first year being spent on general mobilisation activities (e.g. site preparation, main shafts). TBM commissioning and tunnel excavation would occur over the following three to four years. Construction of the Mangere Pump Station would take place over the following two years. Testing and commissioning works may extend into year seven.


Construction activities will occur at the three primary sites for an extended period: Mangere for the whole duration of the construction project, and May Road and Western Springs for between one and

five years depending on TBM drive direction. The secondary sites, involving shafts and sewer connections, will experience construction activity over much shorter periods, typically ranging between 6 to 18 months, but may be occupied for a number of years.

The programme below indicates timeframes for construction utilising a single TBM. If an additional TBM is used construction timeframes may be able to be shortened.

**Table 6-2 Indicative construction programme for main works**

Activity and Description	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
General Mobilization	[Solid bar]						
Temporary Shaft Works	[Dashed bar]						
Mobilization of TBM and Support Plant	[Solid bar]						
Tunnelling	[Solid bar]						
Permanant Shaft Works	[Dashed bar]						
Link Tunnels				[Solid bar]			
Link Tunnel Structures				[Solid bar]			
Mangere Pump Station				[Solid bar]			
Testing and Commissioning							[Solid bar]
Handover							[Solid bar]

Notes:  
 Indicates that activity will be sporadic, not continuous

### 6.17.2 Construction Management Plans

Once a contractor is appointed, and prior to the start of the main construction programme, a construction management plan (CMP) or plans will be prepared which set out the detail of the proposed construction methodology and describe the mitigation measures to be taken to minimise potential adverse effects and ensure compliance with consent conditions.

The construction management plan will address a range of construction issues, including:

**Table 6-3 Construction management plan contents**

Construction Issue	Likely Content of CMP
Construction management	Sets out details of construction methodology.
Coastal works construction management	Sets out details of design, construction methodology and management of effects on the environment within the CMA.
Contaminated land management	Sets out details of the construction methodology for works and presents methods for managing and disposing of contaminated soils.
Traffic management	Sets out details of the proposed traffic management at the construction sites.
Construction noise management	Sets out details of proposed construction noise management.
Vibration management	Sets out details of proposed construction vibration management.
Tree protection	Sets out methods and procedures when undertaking works in close proximity to trees.

Construction Issue	Likely Content of CMP
Accidental discovery protocols	Sets out procedures to follow in the event that archaeological remains, taonga or koiwi tangata (human remains) are exposed while project works are under way.
Erosion and sediment control	Sets out details of the proposed erosion and sediment control measures.
Dust management	Details methods for minimising and monitoring dust generated by construction activities.
Groundwater and settlement monitoring	Sets out measures for monitoring groundwater drawdown and settlement effects and responding to changes.
Hazardous substances management	Sets out measures for management of hazardous substances, including spill response procedures.
Communications management	Sets out details of the proposed internal and external communications for the project during construction, including key internal and external contacts and lines of communication.

Management plans addressing specific topics listed above will be incorporated in the main construction management plan for the project or prepared as standalone plans as appropriate. Draft or outline management plans are contained in a number of the technical reports in Part D of this report.

### 6.17.3 Outline plans

Prior to commencement of construction within the new and existing designations, Watercare will submit an outline plan or plans of works in accordance with s176A of the RMA. These will show:

- The height, shape, and bulk of the public work, project, or work; and
- The location on the site of the public work, project, or work; and
- The likely finished contour of the site; and
- The vehicular access, circulation, and the provision for parking; and
- The landscaping proposed; and
- Any other matters to avoid, remedy, or mitigate any adverse effects on the environment.

### 6.17.4 Hours of operation

Site operational arrangements will likely occur on the following general basis:

- Tunnelling and associated surface activities – 24 hours a day, 7 days a week operations will occur for all tunnelling activities related to the main tunnel works.
- Micro tunnelling, trenching and associated surface activities – this work would normally occur during normal working hours, 7 am to 6 pm, Monday to Friday and 8 am to 6 pm Saturday. However, in particular circumstances, Watercare may need to undertake microtunnelling works 24 hours a day 7 days a week (or alternative extended hours) to meet construction demands, provided that construction work can be managed to meet construction traffic, noise, and vibration requirements.
- Truck movements – normal working hours, 7 am to 6 pm, Monday to Friday, 8 am to 6 pm Saturday. Special deliveries – as required to address traffic management measures.

- General site activities – normal working hours, 7 am to 6 pm, Monday to Friday, 8 am to 6 pm Saturday, and with provision to extend hours during summer daylight savings periods as required.

There may be occasions where it is necessary to continue construction activities outside of usual hours, for example, where it is necessary to complete an activity that has commenced, to tie into the existing network, delivery of large plant or machinery, emergency works, or to tie in with tidal cycles for works in the CMA etc. For works outside of normal hours, appropriate measures will be implemented to ensure construction noise and vibration standards are met where practicable. These measures will be set out in a construction noise and vibration management plan(s).

#### **6.17.5 Traffic**

Prior to construction commencing, Construction Traffic Management Plan(s) (CTMP) will be prepared to address the detailed provisions for each site. The CTMPs will address:

- Signage and notification of the works;
- Construction traffic routes;
- Measures to avoid or mitigate effects, such as restrictions on vehicle movements, stopping restrictions, parking limitations etc.

Draft traffic management measures for those sites where the construction area extends into the road reserve (Whitney Street, Haycock Avenue, and Norgrove Avenue) have been prepared and are contained within the traffic impact assessment in Part D.

Works will be subject to CARs from Auckland Transport (for works in road reserve), NZTA (for works in state highways), and KiwiRail (for works under rail corridors).

#### **6.17.6 Noise**

A draft Construction Noise Management Plan (CNMP) has been prepared (refer Part D Technical Report F). The CNMP provides recommendations and processes to mitigate noise levels from construction activities in accordance with the Construction Noise Standard (NZS6803: 1999). The CNMP covers:

- Communication and consultation protocols;
- Noise mitigation measures;
- Noise monitoring procedures;
- Contingency measures to be implemented when works may exceed the Standard;
- Complaints procedures.

#### **6.17.7 Vibration**

Vibration management will be addressed in the CMP or in a standalone management plan as part of the CMP package. This will identify the standards to be complied with during the works and measures to minimise the effects on health and limit discomfort to people as well as ensure the risk of damage to structures is less than minor. The CMP is likely to include the following:

- Communication and consultation protocols;
- Vibration criteria for the project;
- Construction vibration mitigation measures;
- Vibration monitoring procedures;
- Requirements for condition surveys;



- Contingency measures and complaints procedures; and
- Procedures for storage, handling and use of explosives.

#### **6.17.8 Contaminated sites**

A draft site management plan (SMP) has been prepared to address the management of contaminated soils and is found in Part D Technical Report I. Material requiring disposal off site will be disposed of at an appropriate facility based on the nature of the material. Some sites have already been tested and likely disposal requirements have been identified for these sites (Western Springs, May Road, Mangere Pump Station, and Motions Road).

#### **6.18 Hazardous substances**

Construction works will involve the use of some hazardous substances and refuelling and maintenance activities have the potential to release oil, diesel, degreasers and other contaminants into the environment. Management of hazardous substances will be detailed in the CMP. This will identify the standards to be complied with during the works and measures to minimise the potential effects on health and the environment. The CMP is likely to include the following:

- Requirements for refuelling and maintenance areas;
- Concreting methodology;
- Spill response procedures;
- General procedures for storage, handling and use of hazardous substances; and
- Contingency measures and complaints procedures.

All hazardous substances will be stored, used and disposed of in a manner appropriate to their Hazardous Goods Classification. If a spill of a hazardous material occurs, the project's spill procedures (to be detailed in the CMP) will be followed.

Appropriate measures will be used to manage concrete pours and waste concrete and grout will be disposed of off site.

#### **6.19 Commissioning**

The commissioning of the main project works will be a critical phase of the construction programme. The process will be undertaken in a series of stages and will likely require temporary works to enable flows to be diverted from the existing network into the Central Interceptor and back, to allow trialling of connections, support systems and the pump station. It is likely the process will take several months, with the final switch over only happening when Watercare is confident that the new works are performing as intended.

The actual requirements of the commissioning phase will be known once detailed design work has been completed and construction methods finalised.

## 7.0 Consideration of alternatives

### 7.1 Overview

The consideration of alternatives has been an integral part of developing the Central Interceptor scheme. As described earlier, the concept for the Central Interceptor arose out of the Three Waters Strategic Plan as a solution for meeting Auckland's future wastewater network needs of capacity for future growth, asset duplication, and mitigating combined sewer overflows.

Since that time, Watercare has completed a detailed evaluation of options for undertaking the Central Interceptor, including considering alternative alignments, alternative configurations at construction and connection sites, alternative construction methods, alternative permanent works facilities and operational provisions for managing discharges from the wastewater network.

The following sections summarise the alternatives considered by Watercare in developing the Central Interceptor scheme.

### 7.2 Wastewater network alternatives – regional context

This section provides an overview of the regional wastewater planning work undertaken to confirm the Central Interceptor as the most appropriate and best practicable option for addressing Auckland's wastewater network needs.

Much of this regional planning, and the examination of alternatives, is embedded in the development of the Three Waters Strategic Plan and in more recent work completed by Watercare.

The Three Waters Strategic Plan confirmed the need to provide capacity for the future growth of the Auckland region, the serious need to duplicate the critical section of the Western Interceptor, and the need to mitigate combined sewer overflows.

#### 7.2.1 Future wastewater treatment

To enable future network planning, the first issue that the Three Waters Strategic Plan examined was the location of future wastewater treatment facilities, and whether existing treatment plants had the capacity to meet the future wastewater needs of a growing population.

It was concluded that developing a new wastewater treatment plant did not offer a cost effective or feasible solution to addressing the region's critical wastewater needs. The continued use of the existing Mangere WWTP as the primary regional wastewater treatment facility was concluded to be the most practicable solution, with a future flow diversion from west/north west Auckland to Rosedale and ongoing upgrading of both plants. This is the regional wastewater strategy that Watercare is now implementing.

#### 7.2.2 Options considered for addressing trunk sewer network capacity

The options investigated for addressing the network capacity needs are outlined below, with cost comparisons presented in Section 7.2.5:

- **Do nothing** – This option did not meet Watercare's objectives. Without action in the next 10 – 15 years the Orakei Main Sewer would be at capacity, resulting in dry weather wastewater overflows occurring on a daily basis. The condition of the Hillsborough Tunnel and Manukau Siphon indicated that major asset renewal was required over a similar timeframe. Public health, environmental, residential amenity, cultural and community expectations all oblige Watercare to act to address future wastewater needs.
- **Wastewater minimisation** – Wastewater minimisation involves reducing the production of wastewater at source through a variety of measures such as water efficiency, reuse and reduction, achieved by measures such as education and incentives for people and industry to change their behaviour and operations. While wastewater minimisation should form part of the

planning for any modern wastewater system, it was not considered to be an effective solution alone for addressing the network capacity issues facing a growing Auckland.

- **Duplication of the critical network components** – This would involve duplicating the existing Orakei Main Sewer, Eastern Interceptor, Hillsborough Tunnel, Manukau Siphon and other sewers, by constructing new sewers utilising open cut and tunnelling methods. The works required would be major, covering many kilometres of large transmission sewer replacement across Auckland and involving extensive and disruptive works in the roading network and on private land. This option was not considered to be cost effective or practical.
- **Combined sewer separation** – Separation normally allows for the combined sewer being replaced with a new wastewater pipe, with the previous combined pipe being converted to stormwater only. Experience with the Auckland network indicates that the combined pipe generally does not have sufficient capacity to convey the design storm utilised for sizing modern stormwater systems, and stormwater upgrades are also required. Similarly, as the existing transmission network will not provide sufficient capacity for dry weather flows within 15 – 20 years, this option would also require major upgrade of the transmission network to provide capacity for projected future growth and development. Considering the substantial additional works required to achieve the desired outcome, this option does not meet Watercare’s requirements.
- **Central Interceptor tunnel** – This involves the main Central Interceptor tunnel and link tunnels, running from Western Springs to Mangere, and providing connections to the Orakei Main Sewer and Branches and to the lower Western Interceptor to divert flow from the Hillsborough Tunnel and Manukau Siphon. Based on an integrated assessment, the Central Interceptor was determined to be the best practicable option for addressing the wastewater issues in the Auckland Isthmus.

### 7.2.3 Options for addressing duplication of the Western Interceptor

The options investigated for addressing the duplication of the lower portion of the Western Interceptor were:

- **Do nothing** – This option does not meet Watercare’s objectives. The condition of the Hillsborough Tunnel and Manukau Siphon indicate major asset renewal is required over a 10 to 15 year timeframe. Without duplication of this section Watercare has limited ability to undertake maintenance and asset failure is possible.
- **Duplication of the critical network components** - This would involve duplicating the lower part of the Western Interceptor from the Hillsborough Tunnel, Manukau Siphon and to the WWTP, either by open cut or tunnelling methods.
- **Central Interceptor tunnel** - The Central Interceptor tunnel and link tunnel provide for connection to the lower Western Interceptor, to divert flow from the Hillsborough Tunnel and Manukau Siphon.

### 7.2.4 Options for mitigation of sewer overflows

A range of possible options exist for addressing the environmental effects of overflows from the combined sewer network. These include:

- **Wastewater minimisation** – The main cause of combined sewer overflows is the inflow of stormwater into the combined sewer network. Wastewater minimisation does not represent a solution for reducing overflows from Auckland’s combined sewer network.
- **Combined Sewer Separation** – Auckland experience indicates that successfully completing full separation is very costly and difficult, involving works on individual properties, with a high risk of cross connections occurring during the works.

- **Local Storage Tanks** – This option involves overflow capture and conveyance to a storage tank sized to provide capacity for overflow storage. Once the storm event has passed and capacity has been returned to the wastewater network the tank is pumped out back into the network. In Auckland there are currently a number of local storage tanks being utilised to provide network relief. However, to provide a catchment wide solution local storage tank facilities would need to be established in multiple locations, with overflows captured and conveyed to the storage tank and then conveyed back into the network. As the network is already subject to capacity constraints, this option would also require significant capacity upgrading to achieve network upgrading requirements.
- **Local treatment and disposal** – Options that have been considered include local screening at overflow locations, high rate treatment using ballasted flocculation (ACTIFLO) and UV disinfection. High levels of pollutant and pathogen reduction can be achieved by ACTIFLO combined with disinfection; however, ongoing discharge to local receiving environments is required. As for the storage tank option, as a catchment wide solution local treatment facilities would need to be established at multiple locations, with overflows captured and conveyed to the facility for treatment and discharge.
- **Central Interceptor scheme** – The Central Interceptor scheme has been designed to capture the wastewater overflows from the network. The main project works have been designed to connect to the major transmission sewer overflows, with the CSO Collector Sewers reaching out into the local network to capture local network overflows.

## 7.2.5 Comparison of options for addressing Auckland’s wastewater network issues

Watercare and Auckland Council (and its predecessors) have spent many years considering network capacity, asset risk mitigation and overflow mitigation solutions that are environmentally acceptable and affordable to the community. The Three Waters Strategic Plan highlighted that a preferred solution must meet the future needs of the wastewater network as a whole. The table below presents a summary analysis of how each of the network upgrade options considered above respond to the critical upgrading needs of the Auckland Isthmus wastewater network.

**Table 7-1 Comparison of option performance for addressing wastewater network critical needs**

Option	Critical needs of Auckland Isthmus wastewater network			
	Network capacity	Duplication of lower Western Interceptor	Overflow mitigation	Option Cost
Do nothing	x	x	x	NA
Wastewater minimisation	x	x	x	NA
Network duplication	✓	✓	✓	\$1.35 billion*
Combined Sewer Separation	✓	✓	✓	\$1.42 billion #
Local storage	✓	✓	✓	\$1.1 billion #
Local treatment and disposal	✓	✓	✓	\$1.05 billion #
Central Interceptor scheme	✓	✓	✓	\$800 million

\*Made up of \$870M for duplication works and \$480M for local storage for overflow mitigation  
# includes \$620M required for Central Interceptor main project works  
All costs are in 2011 New Zealand dollars

Based on the evaluations completed in the Three Waters Strategic Plan, and the additional analyses completed by Watercare since that time, the Central Interceptor scheme represents the best practicable option for achieving an integrated solution that meets the future needs of the Auckland wastewater network.

### 7.3 Central Interceptor main project works alignment and design options

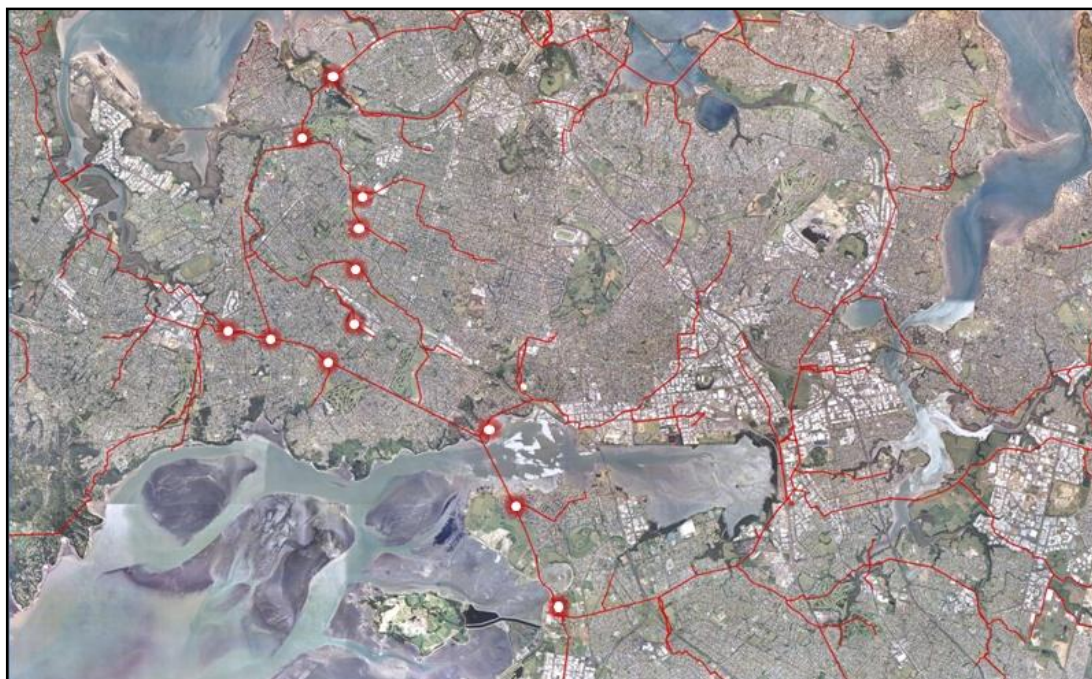
In developing the Central Interceptor main project works a detailed evaluation of options has been undertaken, including considering alternative alignments (horizontal and vertical), alternative configurations at construction and connection sites, alternative construction methods, alternative permanent works facilities and operational provisions for managing discharges from the network. These are summarised in the following sections.

#### 7.3.1 Selection of the Central Interceptor tunnel alignment

The development of the Central Interceptor tunnel alignment has involved a process of evaluating hundreds of alternative alignments. Central to the consideration of these alternatives has been:

- Providing connections to the key points in the transmission sewer network that address flow conveyance and future capacity requirements, and also where major overflow locations exist, and
- The duplication of the Hillsborough Tunnel and Manukau Siphon section of the Western Interceptor.

Key points where connection to the transmission network is required to provide for the above factors are identified as white dots in Figure 7-1.



**Figure 7-1 Key network connections**

Additional alignment evaluation criteria included meeting hydraulic grade requirements and geotechnical constraints for tunnelling, minimising environmental effects, constructability considerations and the overall cost of each alignment option. Alignments were considered both in terms of their vertical and horizontal extent, and a range of potential construction methods were evaluated, included tunnelling, micro tunnelling, directional drilling and open trenching.

Multiple alignments were considered and a shortlisting process utilised to establish alignments which were then subject to more detailed consideration. The shortlisted alignments are shown in Figure 7-2.





**Figure 7-2 Shortlisted Alignment Options**

These shortlisted alignments were then compared by scoring each utilising a Multi Criteria Analysis (MCA) process which took into account network functionality, operational factors, and environmental, social, cultural and economic considerations. The Central Interceptor tunnel alignment (as shown in Figure 1-1) reflects the outcome of this process.

### 7.3.2 Alternative construction site layouts

Alternative layouts for each of the construction sites shown in the drawing set (Part C) have been considered during the development of the layouts now proposed. The design process has aimed to minimise impacts of the construction activities on neighbours and on site features, uses and values. A summary of alternative considerations for each site is presented in Table 7-2 below and further detail of the options considered for each site is contained in Part B.

**Table 7-2 Summary of alternative layouts considered for construction sites**

Site	Alternative configurations
Western Springs and Western Springs Depot	Alternative locations considered at sports fields. Selected location minimises impacts on use of the fields, while the vegetated Bullock Track slope provides screening and noise buffering from adjacent neighbours.
Mount Albert War Memorial Reserve	Alternative locations in reserve considered, including netball courts and carpark. The proposed location minimises impacts on the reserve facilities.
Lyon Avenue	Alternative locations considered, including school playing fields. Layout amended to avoid some tree removal. Proposed location provides direct connection to Lyon Ave overflow.
Haverstock Road	Alternative locations considered, including private land and road reserve. Proposed location provides some separation from neighbours. Alternative site configuration selected took into account discussions with Housing New Zealand renewals project on adjacent land.
Walmsley Park	Alternative locations within park considered. Proposed location minimises impacts on park.
May Road	Alternative locations and layouts considered. These included on adjacent private land and on land to the east of the motorway corridor.
Keith Hay Park	Alternative locations on park considered, including alternative access locations.
PS 23 (Frederick Street)	Alternative locations considered. These included works in Belfast Reserve and alternative construction areas in Grannys Bay and the foreshore at Frederick Street, along with alternative permanent reclamation options at the PS 23 site. The selected site optimised the use of an existing Watercare facility and minimised the area of CMA occupation.
Kiwi Esplanade Reserve	<p>Watercare considered a number of different options for a construction site and air vent within the Mangere Bridge area. Following consultation with Auckland Council, local residents and other organisations, the options were reduced to two preferred sites – one being at the location of the existing toilet block at Kiwi Esplanade and the other in Ambury Park, west of Ambury Road. Both of these options are assessed in the technical reports in Part D of this AEE. Further targeted consultation took place once a conceptual layout for each of these sites had been developed.</p> <p>Having assessed the options and considered feedback received, Watercare selected Kiwi Esplanade as the proposed construction site in Mangere Bridge and are not proceeding with Ambury Park as an option.</p>
Mangere WWTP	Connection to the WWTP site is integral to the project. The selected site utilises an unused area on WWTP land.



Site	Alternative configurations
Motions Road	Alternative locations considered along Motions Road. Proposed location minimises impacts on Western Springs carpark and provides direct connection to Orakei Main Sewer.
Rawalpindi Reserve	Alternative locations considered in reserve and in Chamberlain Park golf course. Proposed location is in the vicinity of existing Watercare assets and retains operation of the existing playground facilities on the reserve while enabling connections to local network.
Norgrove Avenue	Alternative locations considered including private land. Proposed location minimises impacts on private land, while providing for connections to overflow locations.
PS 25 (Miranda Reserve) and Miranda Reserve	Alternative locations in reserve considered, including in reserve on other side of stream and other locations in Miranda Reserve. Overhead transmission lines limit site suitability.
Whitney Street	Alternative locations considered, including on private land near to connection point.
Dundale Avenue	Alternative locations considered.
Haycock Road	Alternative locations considered, including utilising the full width of the road corridor. Alternate locations did not provide suitable area for construction and connection works.

The proposed layout for each site as shown in the drawing set in Part C reflects the consideration of alternatives to date. The layouts are indicative only and may change as a result of the detailed design process and confirmation of the construction methodology.

### 7.3.3 Alternative tunnel and liner options

The selected tunnel horizontal and vertical alignment, construction method, and liner type have all been subject to evaluation. Horizontal alignment considerations are discussed earlier. The vertical alignment has been considered within an envelope to allow for geological conditions that may be encountered and alternative tunnel construction methods.

The main tunnel will most likely be constructed as a bored tunnel utilising a pressurised face TBM to allow for the poor ground conditions between Hillsborough Bay and the Mangere WWTP. Alternative tunnelling methods are possible, and final methods will be selected by the contractor. These methods could include some other form of TBM or use of a roadheader machine where adverse ground conditions are not expected.

Construction of the tunnel liner is important to manage the potential risk of land settlement and provide for the durability and conveyance needs of the wastewater network. The tunnel liner will most likely comprise a low permeability segmental liner placed by the TBM. This will meet settlement management needs and the design requirements of the sewer network. An unlined tunnel or a tunnel liner with high permeability construction would not meet engineering design requirements.

### 7.3.4 Alternative odour treatment options

Where odour treatment facilities are proposed, a range of options have been considered for the type of treatment facility to be used. These include:

- **Biofilters** - these involve passing an air flow through a bed of organic media (wet compost, soil, wood chips), with the media acting as a surface for both physical adsorption processes and biological processes where bacteria growing on the media act to remove the odour generating molecules.
- **Activated Carbon** – air flow is passed through a bed of granular media (activated carbon) and odour molecules are physically adsorbed onto the media surface.
- **Biotrickling Filter** – these scrubbers cultivate the growth of biomass in a nutrient supplemented zone on specific media. The odorous gas stream passes up through the biomass zone in order to remove odorous compounds. These systems are more robust and perform to higher standards than traditional biofilters.
- **Biotrickling Filter and Activated Carbon** – provides treatment to a higher standard than either system acting alone.
- **Chemical Scrubbing** – involves passing the airflow through a chemical mist, typically utilising an oxidising agent such as hydrogen peroxide to chemically remove the odour from the air.

Watercare currently operates biofilters at a number of sites on the wastewater network, including at the new Pump Station 64 at the downstream end of the Hobson Tunnel. Watercare's proposed approach for managing air treatment is detailed in Section 5.5.

#### 7.3.5 Alternative discharge options

Construction site related discharges (tunnel dewatering, wheel wash etc) are required at the construction sites. Alternative locations would still result in discharges occurring. Discharge options and treatment are described in Section 6.7.

Alternative locations for emergency pressure relief discharge from the tunnel have been considered, including locations at PS 25, PS 23 and at Kiwi Esplanade. While the likelihood of the discharge from the EPR structure at the Mangere Pump Station occurring is considered very low, the proposed location was considered to be the best location as it is remote from areas where there is potential water based contact recreation.

#### 7.4 Conclusion

Watercare has evaluated a wide range of alternatives for addressing the wastewater network needs for the Auckland Isthmus and wider area. That evaluation process first confirmed the Central Interceptor as the preferred integrated network upgrading solution, and then involved a detailed consideration of alignment options and design and construction configurations. The Central Interceptor main project works described in this AEE represents the outcome of that process and is considered to be the option that best provides for future wastewater network needs. The work lays the foundations for the wastewater network in this part of Auckland for the next 50 years and represents the most cost effective solution to provide for future growth, asset risk management and an appropriate level of overflow mitigation.

## 8.0 Consultation

### 8.1 Statutory requirements

The purpose of the consultation undertaken to date on the Central Interceptor scheme is to assist with development and successful delivery of the project and to support the legislative requirements for the NoRs and applications for resource consent under the RMA.

The RMA provides for consultation with tangata whenua under sections 6(e), 7(a) and 8, where section 6(e) requires an applicant to recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga; section 7(a) requires an applicant to have particular regard to kaitiakitanga; and section 8 requires an applicant to take into account the principles of the Treaty of Waitangi.

The RMA states that an AEE submitted in support of a resource consent application or NoR should include an identification of the persons affected by the proposal, the consultation undertaken, if any, and any response to the views of any person consulted (Schedule 4 RMA).

Section 36A of the RMA clarifies that consultation is not mandatory by either an applicant or the local authority with respect to a NoR or resource consent application. However, best practice would normally incorporate consultation as an integral component of project development and pre-application phases, particularly for major projects such as the Central Interceptor scheme. Stakeholder engagement on major projects is also supported by Watercare's Statement of Intent which outlines the company's activities, intentions and objectives.

### 8.2 Consultation phases

In summary, consultation has been or will be carried out in the following phases of the project:

- Project inception – confirmation of the need for the project arising from the Three Waters Strategic Plan;
- Project development – concept design, assessment of effects on the environment, statutory process and detailed design phases of the project;
- Project delivery – procurement, pre-construction and construction phases of the project.

These consultation phases are described below.

#### 8.2.1 Project inception

The need for the Central Interceptor scheme was established in the Three Waters Strategic Plan. The Three Waters Strategic Planning process was undertaken jointly by Watercare and the former territorial local authorities and network operators of the Auckland Region. The former Auckland Regional Council participated as an observer.

Consultation during the programme primarily involved the participating organisations listed above, at both staff and political levels. Targeted consultation was undertaken with other organisations.

The development phase of the Central Interceptor scheme commenced in late 2009. Consultation during 2009 and 2010 included briefings to Auckland Councillors and Watercare's Maori and Environmental Advisory Groups, overview meetings with senior Auckland Council managers and informal meetings with other external parties. Initial contact was also made with owners of potential sites for the major construction activities.

#### 8.2.2 Project development

Consultation with a range of parties has occurred or will occur as part of the project development phase. In summary, the consultation inputs include:

- Targeted consultation to provide input for concept design (2011);

- Targeted and wider community consultation to provide input for refinement of the concept design, and to assist in the preparation of the AEE and RMA application documents (to mid 2012);
- Consultation during the statutory process to address matters raised in submissions (to be undertaken late 2012 – 2013);
- Consultation with directly affected parties on matters of detail to be incorporated in the final design of the project (to be undertaken 2013 – 2015).

A summary of the consultation undertaken to the end of June 2012 is presented in Section 8.3.

### **8.2.3 Project delivery**

A detailed project communications plan will be developed prior to construction. The communications plan will cover matters such as:

- The methods of consultation and liaison with key stakeholders, owners and occupiers of neighbouring properties and the wider community regarding the likely timing, duration and effects of works;
- Name and contact details for the nominated community liaison person and alternative contact details in the event of that person not being available (to ensure a contact person is available by telephone 24 hours per day seven days per week during the construction phase); and
- Procedures to record and respond to complaints.

The communications plan will be implemented during construction, and updated and revised as appropriate.

### **8.3 Consultation undertaken to June 2012**

Consultation undertaken with various parties to the end of June 2012, key outcomes and responses of the consultation process are summarised in the following pages. The process has included telephone calls, meetings and open days, and written information provided in correspondence, e-mails, a project information sheet and on Watercare's website. The parties involved in the consultation process to date are:

- Local boards;
- Auckland Council staff – particularly the Parks, Sports and Recreation, stormwater and regulatory groups;
- Tangata whenua;
- Transport Authorities – Auckland Transport, New Zealand Transport Agency and KiwiRail;
- Network utilities;
- Other agencies – New Zealand Historic Places Trust and Department of Conservation;
- Directly affected landowners;
- Landowners adjacent to construction sites;
- Wider community and interest groups including St Lukes Environmental Protection Society (STEPS) and Mangere Bridge Residents and Ratepayers Association; and
- Watercare Advisory Groups – Maori Advisory Group, Environmental Advisory Group, Mangere Community Liaison Group.

## **8.4 Auckland Council**

### **8.4.1 Local Boards**

The Central Interceptor scheme is within the local board areas of Waitemata, Albert-Eden, Whau, Puketapapa and Mangere-Otahuhu.

Initial presentations on the project were made to the local boards in 2011, followed by further meetings and site visits with local board representatives in late 2011 and in 2012. Site visits to the proposed construction sites in reserves were undertaken with representatives of the Albert-Eden, Whau and Puketapapa Local Boards in April, May and June 2012.

In summary, key matters raised by local boards have included:

- Scope and extent of project and physical works;
- Timing and duration of works;
- Extent of combined and separated sewer areas;
- Location and extent of existing overflows;
- Stormwater implications, quality of streams and waterways; effects on flooding;
- Support for overflow reduction and cleaning up of waterways;
- Local alternatives for storage and treatment;
- Extent of project influence and benefits to geographic areas;
- Effects of construction works in reserves and in surrounding local areas (particularly effects on pedestrians and vehicular traffic);
- Air treatment facilities and odour potential;
- Extent of iwi involvement; and
- Opportunities for further engagement with local boards.

Representatives of the Mangere-Otahuhu Local Board raised questions regarding the implications of the Central Interceptor scheme on the Mangere WWTP, and were strongly opposed to a proposal to place a construction site and air vent in the western most end of the Kiwi Esplanade reserve. Alternative sites for the construction works and air vent in Mangere Bridge were reviewed following feedback from the local board and other community representatives.

The extent and effects of physical works, pedestrian access and local board aspirations for stream naturalisation were particular matters raised in relation to the proposed works in parks in the Waitemata, Albert-Eden, Whau and Puketapapa Local Board areas. Some amendments have been made to earlier construction site layouts in response to issues raised. Watercare will continue to work closely with local boards during detailed design to address these issues in the final site layouts and reinstatement plans.

Watercare representatives also attended meetings of the Orakei, Maungakiekie and Manurewa Local Boards to provide information on the project. The influence of the Central Interceptor scheme extends into the Orakei Local Board area as it relieves capacity in the Orakei Main Sewer and into the Maungakiekie Local Board area as it picks up flows from the Royal Oak and Onehunga Branch Sewers. Particular aspects of interest to these local boards were the extent of benefits arising from the project and whether network improvements were also planned in these local board areas.

### **8.4.2 Parks, Sports and Recreation**

A number of the proposed construction sites are within Auckland Council parks. Accordingly, numerous discussions and site visits have taken place with Parks, Sports and Recreation (PSR) staff. Particular concerns raised in the initial discussions included the effects of the works on amenity and

parks users; disruption to access; impact on future park development (particularly at Keith Hay Park) and the cumulative effects of infrastructure in parks.

A key change made in response to matters raised was the relocation of the construction site at Keith Hay Park. Initial discussions with PSR staff also contributed to the relocation of the construction site at Mangere Bridge (originally proposed at the western most end of the Kiwi Esplanade reserve).

The layout at all of the proposed construction sites in parks will continue to be developed in consultation with PSR staff, along with the details of reinstatement on completion of works. A number of opportunities to integrate with future Auckland Council works have also been identified – for example the potential for daylighting and enhancement of streams at some construction sites.

### **8.4.3 Stormwater**

Watercare has worked closely with Auckland Council's Stormwater Unit during development of the Central Interceptor scheme and will continue to do so as the design is developed. Key aspects which have been discussed during the consultation process have included consistency of works programmes, consent processes and opportunities to integrate works.

### **8.4.4 Regulatory**

A regulatory liaison group was established early in 2012 with the purpose of this group being to manage the statutory processes for the project. The group comprises regulatory staff from Auckland Council and Watercare representatives.

Draft application documents were provided to Auckland Council for review in April 2012. In response to the review comments received, further assessment has been undertaken in some areas (e.g. noise, traffic and visual effects) and additional information has been included within the final application documents. Specific discussions have also taken place regarding the scope and potential effects of the project.

## **8.5 Tangata whenua**

### **8.5.1 Overview**

Tangata whenua have a strong historical and cultural relationship with the land, water and harbours traversed by the Central Interceptor scheme. Initial iwi engagement commenced in 2009 with presentations to Watercare's Maori Advisory Group. The Maori Advisory Group (MAG) comprised external parties with appropriate expertise or background to provide independent advice to Watercare. Further presentations and discussions with the MAG regarding the Central Interceptor scheme occurred in 2011 and in February 2012.

The MAG was disestablished in early 2012 and a process is now well underway to replace it with a new entity to represent nineteen iwi of the Auckland area. The overall objectives of the entity are to provide high level advice to Watercare on relationships and policy. An implementation group is also being established (comprising environmental or kaitiaki managers of each iwi) to provide advice on specific projects.

As the entity is still being established, discussions have taken place with iwi either individually or sub-regionally i.e. Ngati te Ata and Ngati Tamaoho, and Kawerau a Maki and Te Ahiwaru (Makaurau Marae).

Direct contact with representatives of individual iwi commenced in early 2012 and is ongoing. The iwi contacted and the extent of their direct involvement to date is summarised in the section below, followed by a preliminary list of issues arising.

To assist with the consultation process, Watercare engaged external advisors to provide guidance on who should be consulted and how this should be conducted so as to facilitate positive relationships

based on Treaty of Waitangi principles and integrity. The external advisors have attended meetings along with Watercare representatives and made introductions depending on which iwi was being met.

### 8.5.2 Affected and interested tangata whenua groups

The following iwi were contacted and advised of the Central Interceptor scheme, initially to confirm their relationship with the project area and receiving environments, and invited to participate at their choosing.

**Table 8-1 Iwi organisations and involvement**

Iwi	Organisation	Involvement to Date
Ngati Whatua	Te Runanga o Ngati Whatua	Presentation and meeting in May 2012.
Ngati Whatua o Kaipara	Ngati Whatua O Kaipara Charitable Trust	Initial contact
Ngati Whatua Orakei	Ngati Whatua Orakei Trust	Initial contact and meeting in July 2012.
Te Kawerau a Maki	Te Kawerau a Maki Tribal Trust	Presentation and meeting in June 2012; offered to prepare cultural report.
Te Aakitai	Te Aakitai Waiohau Iwi Authority	Initial contact; meeting in July 2012
Te Ahiwaru	Makaurau Marae	Presentation and meeting in June 2012; offered to prepare cultural report.
Ngai Tai ki Tamaki	Ngai Tai Ki Tāmaki Tribal Trust	Initial contact and meeting in July 2012.
Ngati Te Ata	Te Ara Rangatu o Te Iwi o Ngati Te Ata Waiohau	Confirmed interest in project February 2012 and offered to prepare cultural report.  Meetings with Ngati te Ata representatives in February, May, June, and July 2012.
Ngati Tamaoho	Ngati Tamaoho Trust	Presentation and meeting in June and July 2012.
Ngati Maru		Presentation and meeting in May 2012.
Ngati Tamatera	Te Runanga a Iwi o Ngati Tamatera	Initial contact
Ngati Whanaunga	Ngati Whanaunga Environment Unit	Initial contact
Ngati Paoa	Ngati Paoa Trust	Presentation and meeting in June 2012.
Te Patukirikiri		Presentation and meeting in June 2012.
Hauraki Confederation	Hauraki Maori Trust Board	Initial contact
Waikato Tainui	Waikato-Tainui Raupatu Trust	Initial contact; meeting in July 2012



Key contacts have been established, with consultation involving presentations, meetings, site visits, ongoing correspondence and exchange of information. A draft copy of the AEE documentation for the project was provided for review and comment in June 2012.

### 8.5.3 Outcomes and responses

Key themes arising from consultation with iwi representatives to date are summarised in the table below.

**Table 8-2 Tangata whenua consultation – key themes and responses**

Theme	Response
Historical degradation of the Manukau Harbour and ongoing pollution sources. Effects on fish and shellfish, potential for re-establishment of fisheries.	A report is being prepared to collate existing information on the Manukau Harbour to support ongoing improvements and collective action.
Increased flow and proposed treatment at the Mangere WWTP.	The increase in flow arising from the collection of wet weather overflows represents less than approximately 2% of the existing volume treated at the Mangere WWTP. A wet weather treatment facility is proposed to enhance the existing system.
Strategic improvements including Northern Interceptor, Rosedale and Mangere WWTP upgrades. Future use of existing and new WWTPs to provide for population growth.	Watercare is continuing to review strategic improvements across the network, along with the long term future of the Rosedale and Mangere WWTPs, and options and opportunity for re-use.
Risks associated with existing Western Interceptor across the Manukau Harbour.	Existing risks will be mitigated with the construction of the Central Interceptor tunnel.
Environmental effects of physical works; proposed monitoring.	Assessments of potential environmental effects have been undertaken and mitigation measures proposed, as described in other sections of this AEE report. Archaeological and kaitiaki monitoring will occur in areas where there is potential for discovery of archaeological features.
Potential effects of works in Ambury Park, an area of significant cultural value.	A site in Ambury Park was considered as an alternative to the Kiwi Esplanade site. Having assessed the options and considered feedback received, Watercare selected Kiwi Esplanade as the proposed construction site in Mangere Bridge. No surface works are proposed in Ambury Park. The main tunnel will pass underneath part of Ambury Park, approximately 30 m below ground level.
Opportunities for stream naturalisation.	Watercare has sought advice on opportunities for stream naturalisation as part of site reinstatement works. As there are numerous parties involved in stream naturalisation, Watercare will work with these parties to review potential integration of projects. Works to be undertaken by Watercare will be developed in the detailed design phase and set out in site reinstatement plans prepared in consultation with the

Theme	Response
	landowners, local boards and established environmental interest groups.
Extent of stormwater inflows into the wastewater network.	Watercare is working closely with Auckland Council to find solutions that will reduce stormwater inflows into the wastewater network.
Effects of reduced stormwater flows into the streams on base flows and water quality.	Central Interceptor will reduce the levels of wastewater and stormwater contaminants discharging to receiving waters and will enhance water quality and ecological health of water bodies.
Extent of network overflows into the Manukau Harbour; whether Central Interceptor will make a difference to these.	<p>The wastewater network in the Mangere Bridge and wider Manukau area is separated from the stormwater network, so the frequency of wet weather overflows from the network in this area is significantly less than in areas of the Auckland isthmus where the networks are combined. The existing Mangere Bridge Branch sewer will be diverted into the new Central Interceptor tunnel to maintain current levels of service. The elimination of a pump station within Kiwi Esplanade will help to reduce the risk of overflows and odours associated with this facility.</p> <p>The removal of the existing PS 23 will reduce the risk of odours in the vicinity related to operational or maintenance issues with the pump station.</p>

The above is an initial list of issues raised by iwi representatives. The consultation process is ongoing, and will continue through the project development and delivery phases.

## 8.6 Transport authorities

The Central Interceptor scheme interfaces with existing or future transport corridors at a number of locations, as summarised earlier in this report. Initial meetings with representatives of Auckland Transport and the New Zealand Transport Agency (NZTA) have taken place to discuss the proposed works, and initial contact made with KiwiRail.

An initial meeting has taken place with Auckland Transport. Auckland Transport will be closely involved in the project works during the preparation and implementation of Traffic Management Plans. Corridor Access Requests will be submitted to Auckland Transport for approval for all works within roads.

Discussions with representatives of NZTA have focussed on construction sites and works in the vicinity of the Western Springs interchange (SH16) and the Waterview Connection (extension of SH20).

## 8.7 Network utilities

Network utility companies will be contacted as the design progresses in order to confirm the locations of existing services or any future development plans in the vicinity of the proposed construction sites.

Between Pump Station 23 (Frederick Street) and the Mangere WWTP, the proposed Central Interceptor tunnel passes under the New Zealand Refining Company's (NZRC) Refinery to Auckland Pipeline, Vector's high pressure gas pipelines and Transpower's transmission lines. The location of these major services is shown on Figure 9-4. Overhead transmission lines are located at the proposed construction sites in Miranda Reserve, Blockhouse Bay, and the main tunnel also passes under land in the vicinity of a substation at White Swan Road.

Information on the proposed works has been provided to Vector, Transpower and the NZRC and initial advice received in relation to works in the vicinity of the major facilities is noted above.

## **8.8 Other agencies**

Initial contacts have been made with the Department of Conservation (DoC) and Historic Places Trust (HPT). These contacts have particularly focussed on the site at Pump Station 23 (Frederick Street) in relation to the works in the CMA.

Consultation with these agencies, as well as the network utilities, Auckland Transport, NZTA and KiwiRail will continue during the development and implementation phases of the project.

## **8.9 Directly affected landowners**

### **8.9.1 Surface construction sites**

All of the directly affected landowners at the construction sites (i.e. sites to be designated) have been contacted by Watercare. The directly affected landowners are listed in Attachment 2 of the Notices of Requirement. These include private landowners, Crown agencies, Auckland Council (PSR), Auckland Transport, and Regional Facilities Auckland.

Consultation undertaken with NZTA, Auckland Council (PSR) and Auckland Transport is summarised earlier. Matters raised in consultation with Housing New Zealand, Plant and Food Research, Ministry of Education and Regional Facilities Auckland have included implications for existing and future development; timing and duration of works; effects of construction, site reinstatement and ongoing access requirements. The site specific assessments in Part B of this AEE document reflect many of the main issues raised during consultation.

There are also five private landowners whose land is within the area of the proposed designations. The effects on these properties include both temporary and permanent effects. Depending on the extent of work at each site, Watercare will seek agreements for temporary access, or for partial or full property purchase.

At the time of writing this report, the necessary property access and occupation arrangements are not finalised, but initial negotiations have commenced or are well underway. Matters raised by directly affected landowners will be addressed as part of the ongoing negotiations between each of the landowners and Watercare.

### **8.9.2 Landowners above tunnel alignment**

The project information sheet referred to earlier was delivered along the corridor of the proposed tunnel alignment in May 2012. Approximately 800 properties are located within this corridor.

It is expected that owners and occupiers of these properties will receive direct notification from Auckland Council during the RMA notification process.

Once the detailed design is completed and the final alignment known (around 2014), Watercare will formally notify landowners directly above the tunnel alignment in accordance with the Local Government Act. This process requires either that the owners' prior written consent is obtained or the owners are given an opportunity to object to the works at a formal hearing. This is a separate process effectively dealing with Watercare obtaining a property right for its proposed works, rather than the environmental and resource management approvals to be sought under the RMA.

## **8.10 Wider community consultation**

The wider consultation process has involved the following activities:

- Distribution of a project information sheet and five open days in various locations;
- Contact with landowners adjacent to the construction sites;

- Contact and meetings with interest groups and organisations.

These activities are summarised below.

### **8.10.1 Information sheet and open days**

A project information sheet was distributed to around 22,000 households and businesses along the length of the project in May 2012 and interested parties invited to attend a series of five open days between 21 and 26 March.

At the open day in Mangere Bridge, over 100 residents attended. Around 20 – 30 residents or other interested parties attended each of the other four open days in Keith Hay Park, Sandringham and Mt Albert.

Attendees at the open days were also invited to record their comments on feedback forms at each open day. Forty eight written feedback forms were received, with most of these being from Mangere Bridge residents. The main concerns recorded were the potential for odour nuisance and the need to install odour treatment facilities, and a desire to see the infrastructure located as far as possible from residential properties.

Key issues raised at open days and in the feedback forms are summarised below, generally in the order of frequency with which the issue was raised.

- Opposition to infrastructure at Kiwi Esplanade reserve;
- Infrastructure to be located far away from residential properties; in Ambury Park rather than Kiwi Esplanade;
- Install treatment to avoid any odour to Mangere Bridge residents;
- Concern over future potential for increased volume of discharges into Manukau Harbour and degradation of water quality;
- Desire for alternative options / routes to be investigated;
- Desire to understand the long term future of the Mangere WWTP;
- Need to undertake appropriate mitigation, install facilities (e.g. toilets), vegetation, screening etc as part of the project works;
- Specific environmental concerns identified (e.g. birds);
- Cease combined stormwater / wastewater system;
- Wastewater responsibility should be shared with other locations / increase discharges to Waitemata Harbour;
- Project cost projections.

The project information sheet and public notices in local papers invited interested parties to the open days summarised above, and also referred the public to Watercare's website and a Central Interceptor project email address for further information. There has been a low level of response via the project e-mail address since it was established in March 2012.

### **8.10.2 Adjacent landowners**

Owners of properties located immediately adjacent to proposed construction sites were sent a letter including the project information sheet in mid May 2012. The letter included an invitation to attend the open days or to contact Watercare directly if they were unable to do so and wanted more information about the proposed works.

Subsequent discussions took place with landowners immediately adjacent to the construction sites at Mount Albert War Memorial Reserve, Haverstock Road, Walmsley Park, May Road, Keith Hay Park, Pump Station 23 (Frederick Street), and Mangere Bridge.

The matters raised primarily related to the potential construction effects (traffic, noise, vibration, settlement, visibility, security), effects on pedestrians and long term effects (potential for noise and odour, access requirements).

The layout at the Keith Hay Park site was revised in response to matters raised by adjacent residents, with a connection point and drop shaft being relocated further from the residential boundary.

Residents of Wairere Avenue contacted Watercare on a number of occasions and requested the site be relocated within Mt Albert War Memorial Reserve, further from residential boundaries. Watercare subsequently reviewed the proposed works site and prepared a concept layout for an alternative utilising the lower car parking area. An alternative nearer to New North Road was also considered. However, as those alternatives would have greater overall impact on the park and park users, they were not pursued. The layout of the proposed site will be reviewed in the detailed design phase so that potential effects on residents are minimised to the greatest possible extent.

### **8.10.3 Interest groups and organisations**

#### **8.10.3.1 St Lukes Environmental Protection Society**

Watercare representatives have met or corresponded with committee members of the St Lukes Environmental Protection Society (STEPS) on a number of occasions and made presentations to their Annual General Meetings in June 2010, 2011 and 2012.

Over this time, STEPS has been generally supportive of the Central Interceptor scheme and the expected reduction in overflows to local streams. In summary, particular issues raised in recent discussions have related to the design target; sewer / stormwater separation works; future proofing to accommodate growth and climate change; effect of network changes on base stream flows; stormwater management; stream enhancement opportunities; and effects of the Lyon Ave construction site on the reserve area. STEPS has been involved for a number of years in planting and restoration initiatives along Meola Creek. The organisation has expressed a strong interest in being involved in the development of site reinstatement plans for the construction sites adjacent to local streams, particularly at Lyon Ave.

#### **8.10.3.2 Mangere Bridge Residents and Ratepayers Association**

Meetings took place with committee members of the Mangere Bridge Residents and Ratepayers Association (MBRRA) in April and May 2012 and a presentation was made to a general meeting of the association in April 2012.

At the general meeting of the MBRRA in April, strong opposition was raised to the project; particularly the proposed construction site and air vent in Mangere Bridge, which at that time was sited at the western end of Kiwi Esplanade. The concerns primarily related to the potential odour from the vent and the permanent impact of the structure on the reserve, adjacent residents and on visitors' experience of the area. As noted earlier, alternative sites for the construction works and air vent have since been reviewed.

Other matters included: further impact on the Mangere Bridge community while other areas benefit; long term future of the Mangere WWTP and ongoing discharge to the Manukau Harbour; need to re-consider project alternatives to avoid works in Mangere Bridge; and reasons for not pursuing a previously proposed north-western treatment plant.

#### **8.10.3.3 Other interest groups and organisations**

A number of other interest groups and organisations were sent a copy of the project information sheet in May 2012. Representatives of some groups attended the open days summarised earlier.

### 8.11 Watercare advisory groups

The Central Interceptor scheme has been discussed with Watercare's Environmental Advisory Group (EAG), the Mangere Community Liaison Group (CLG), and the (former) Maori Advisory Group (MAG). The involvement of the MAG is referred to earlier in this section of the report.

The EAG and Mangere CLG meet quarterly and comprise a number of external parties with appropriate expertise or background to provide independent advice to Watercare. The role of the Mangere CLG is established in conditions of existing resource consents for the operation of the Mangere WWTP.

Initial presentations to the EAG took place in 2009, followed by further updates and discussion in 2010 and 2012. The EAG reviewed the draft AEE in March 2012 and provided feedback on a range of matters. These have now been reflected in this final AEE. Particular areas of interest were in groundwater, settlement and the air management strategy.

The most recent discussion with the Mangere CLG was in March 2012. In summary, particular matters of concern and issues raised related to the need for the project; alternatives considered; increased flows to the Mangere WWTP; the long term future of the Mangere WWTP and discharge to the Manukau Harbour; stormwater management; effects on Manukau Harbour; the construction site and air vent at Kiwi Esplanade; and Watercare, Auckland Council and regulatory approval processes.

Alternatives for a construction site and air vent in Mangere Bridge were reviewed following feedback from the Mangere CLG and other community representatives.

### 8.12 Key consultation outcomes

The main outcome of the consultation process to date has been the changes and refinements made at some of the proposed construction sites. The changes made at specific sites are summarised in Table 8-3 below. These changes are reflected in the drawings included in the A3 drawing set (Part C).

**Table 8-3 Key consultation outcomes**

Site	Shaft No.	Changes made in response to consultation undertaken
Western Springs	WS 1	Revised construction exit arrangement via Stadium Road to minimise potential traffic conflicts.
Mount Albert War Memorial Reserve	AS 1 L2S3	Alternatives considered in response to residents' concerns however original site has been retained as this is considered to have lower overall impact on the community. Detailed design process to consider site layout to minimise potential impacts on residents to the extent practicable. Designation area has been increased to provide greater flexibility for this.
Lyon Avenue	AS 2	Revised access road layout to minimise impact on significant trees.
Haverstock Road	AS 3	Revised layout to reflect alternative accesses minimising impacts on property owned by Housing New Zealand and Plant & Food Research.
Walmsley Park	AS 4	Nil*
May Road	WS 2	Nil*
Keith Hay Park	AS 5	Site location changed from within Keith Hay Park north of swimming pool to private land at 22 Gregory Place and Council properties at 49 – 51 Arundel Street to minimise impact on park usage. Connection point and drop shaft relocated further from

Site	Shaft No.	Changes made in response to consultation undertaken
		residential boundary.
Pump Station 23 (Frederick Street)	AS 6	Revised permanent works layout to avoid permanent reclamation and enable removal of existing pump station building.
Kiwi Esplanade	AS 7	Revised site location to reduce visibility of permanent works and impact on open space – previous location at western end of Kiwi Esplanade replaced with site further east on Kiwi Esplanade (toilet block). Decision to proceed with Kiwi Esplanade option rather than Ambury Park.
Mangere Pump Station	WS 3	Nil*
Motions Road	L1S1	Nil*
Western Springs Depot	L1S2	Site location shifted west to reduce impact on "back of house" activities during stadium events.
Rawalpindi Reserve	L2S1	Nil*
Norgrove Avenue	L2S2	Nil*
Pump Station 25 (Miranda Reserve)	L3S1	Nil*
Miranda Reserve	L3S2	Nil*
Whitney Street	L3S3	Site location shifted to road reserve to avoid impact on private property.
Dundale Avenue	L3S4	Nil*
Haycock Avenue	L3S5	Nil*

\* At these sites the designation area is of sufficient size to retain flexibility for the final site layout. In addition, a condition is included in the proposed designation which requires a detailed reinstatement plan to be developed for each site in consultation with the landowner.

The layout and design of the works at construction sites will continue to be refined during the detailed design process and development of the construction methodology.

### 8.13 Summary

Generally, parties consulted in the Auckland isthmus area have been supportive of the overall project, particularly the benefits associated with reduced overflows to the environment. In the Manukau area, there has been opposition to the project from residents and organisations consulted – key strategic issues being the future of the Mangere WWTP and the need to consider long term alternatives to the treatment plant and the discharge into the Manukau Harbour.

In all areas there have been concerns raised about the location and details of some construction sites. Where practicable, these issues have been addressed, as noted in the summary table above, or will be addressed in the ongoing development phases of the project.



Discussions with owners of land required for the construction sites will also continue and owners of land above the main tunnel and link sewers will be formally notified during the RMA statutory process and the LGA notification process.

Ongoing consultation with the wider community during the pre-construction and construction phases will also be critical to project delivery given the scale and location of the works and the scope of construction management required. The details of the consultation / communications process in those phases will be developed at a later date.

## 9.0 Existing environment

The following sections provide a general description of the environment across the geographical extent of the main project works. It draws on information contained in the technical reports in Part D. The existing environment at the construction sites is described for each site in Part B.

### 9.1 Land Use

The Central Interceptor main tunnel and link tunnel alignment passes through the urban environment of the Auckland Isthmus. Land use in the general vicinity of the project is predominantly suburban residential, with some higher density residential, commercial and retail and urban parks.

The alignment of the main project works is described in Section 5.2.2 and the land uses above the route of the tunnels are described for each tunnel section in Table 5-2 and Table 5-3. It passes through the CMA under the Manukau Harbour between Hillsborough on the northern side and Mangere Bridge on the southern side. The alignment is west of the Port of Onehunga and the SH20 Manukau Harbour Crossing.

On the southern side of the Harbour the alignment passes under the residential area of Mangere Bridge and the rural/reserve area of Ambury Park.

The main tunnel and three of the link sewers will be well below ground level. Above ground structures and construction activities will be located at the construction sites and for Link Sewer 4 between Kiwi Esplanade and Witla Court which will be trenched. More specific information about the land use in the area of each of the construction sites is provided in Part B.

### 9.2 Communities

The alignment of the main project works passes through a number of Auckland suburbs, from Western Springs in the north to Mangere Bridge in the south, and from New Windsor in the west to Mount Roskill in the east.

The communities are represented by four Wards and five Local Boards:

**Table 9-1 Auckland Council Wards and Local Boards in main project works area**

Ward	Local Board
Waitemata and Gulf	Waitemata
Whau	Whau
Albert-Eden-Roskill Ward	Albert-Eden Puketapapa
Manukau	Mangere-Otahuhu

### 9.3 Watercourses, catchments and receiving environment – Waitemata Harbour

There are four streams within the Central Interceptor catchment – Motions Creek, Oakley Creek, Meola Creek and Whau Creek. The streams and their catchments are shown in Figure 9-1.

The coastal receiving environments lying adjacent to the Central Interceptor catchment are Whau River Estuary, Waterview Embayment, Pollen Island, Point Chevalier Beach, Meola Creek estuary and Te Tokaroa (Meola) Reef, and Motions Creek estuary. These coastal areas form part of the Central Waitemata Harbour. The Central Waitemata Harbour extends from the Upper Harbour Bridge and Henderson Creek in the west to the harbour entrance between North Head and Bastion Point in the east.

The freshwater environments are summarised below.

### **9.3.1 Oakley Creek**

Oakley Creek is classified under Section 3.5 of the ARP: ALW as primarily a Type 4 (highly disturbed urban stream), with some Type 5 (artificial or concrete channelised urban stream) reaches in the upper catchment (e.g. Keith Hay Park). Oakley Creek is a large stream with deep pools suitable for large eels. Downstream of New North Road it has a relatively low level of channel modification, although hydrological changes due to urbanisation have probably affected the channel form.

Ecological surveys of Oakley Creek (not undertaken as part of this project) have shown macroinvertebrate community metrics are indicative of degraded water quality and degraded habitat opportunities. Fish communities have been found to vary at different sampling points, with a more diverse community below the waterfall at Waterview Glades.

### **9.3.2 Motions Creek**

Motions Creek is a Type 4/5 urban stream under the ARP: ALW classification. Sections of Motions Creek have been piped and significant erosion protection is in place. Motions Creek is identified as a degraded urban stream in the ARPS (Map 5 Sheet 2).

The open channel of Motions Creek is approximately 1.6 km long from Western Springs Lake to its mouth downstream of Meola Road, on the eastern side of Te Tokaroa (Meola) Reef. The upper reaches of the stream have been piped and emerge just upstream of the point at which the stream is joined by outflows from Western Springs Lake.

### **9.3.3 Meola Creek**

Meola Creek is a Type 4 urban stream due to the high percentage of impervious catchment. Meola Creek is identified as a degraded urban stream in the ARPS (Map 5 Sheet 2). It is approximately 2.6 km long. The headwaters are entirely piped. Through Chamberlain Park Golf Course the riparian zone is generally open, and below the motorway the stream is shaded by exotic vegetation with an understory of weed species.

An ecological survey (1998) downstream of the SH16 motorway crossing found the creek was typical of an urban stream, with a relatively high degree of habitat modification and low water quality.

### **9.3.4 Whau Creek**

Whau Creek is a Type 4 urban stream due to the high percentage of impervious catchment. Whau Creek is a short tributary (3.8 km long) of the Whau River estuary. The creek originates south of Mount Roskill and flows to the west through Blockhouse Bay and then north west through New Lynn.



Waitemata Harbour



Motions Stream

Motions

Meola Creek

Meola

Oakley Creek


Oakley


Whau

Whau

Manukau Harbour

**Legend**

 Streams

 CI Catchment Boundary

Notes:  
This map is confidential and shall only be used for the purpose of this project.  
Map features depicted in terms of NZTM projection.

Data Sources:  
NZ Topographical Features - LINZ NZ National Topo Dataset 2010  
Cadastral Boundaries - LINZ NZ Cadastral Dataset 2011

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**CENTRAL INTERCEPTOR**  
Freshwater Receiving Environments

**AEE AUGUST 2012**



Map No: 60102004\_08\_002\_05

Scale: 1:35,000 (A4 size)



Drawing No: **FIGURE 9.1**

Rev: **E**

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## 9.4 Manukau Harbour coastal environment

Works will occur in the CMA in Manukau Harbour. These are the construction platform at PS 23 (Frederick Street), the main tunnel crossing beneath the seabed, and the EPR structure at Mangere WWTP.

The Manukau Harbour, located on the south western fringes of the Auckland metropolitan area, is the second largest harbour in New Zealand. It has a surface area at high spring tide of 340 km<sup>2</sup> and a shoreline length of over 100 km. Geological processes over several million years have created the harbour in its present state as a drowned river valley formation. The main body of the harbour is shallow, with about one-third of its surface area exposed at low tide. The harbour receives drainage from an 870 km<sup>2</sup> catchment, comprising mainly small streams with catchments typically extending some 10 km landward of the water's edge. Predominant catchment land uses are the Auckland urban area in the north east with rural and agricultural land in the east and south, and forested hill country in the north west and south east (T&T, 1986).

Table 9-2 contains tidal and extreme water level information from the Port of Onehunga.

**Table 9-2 Tide levels from the Port of Onehunga (LINZ, 2010)**

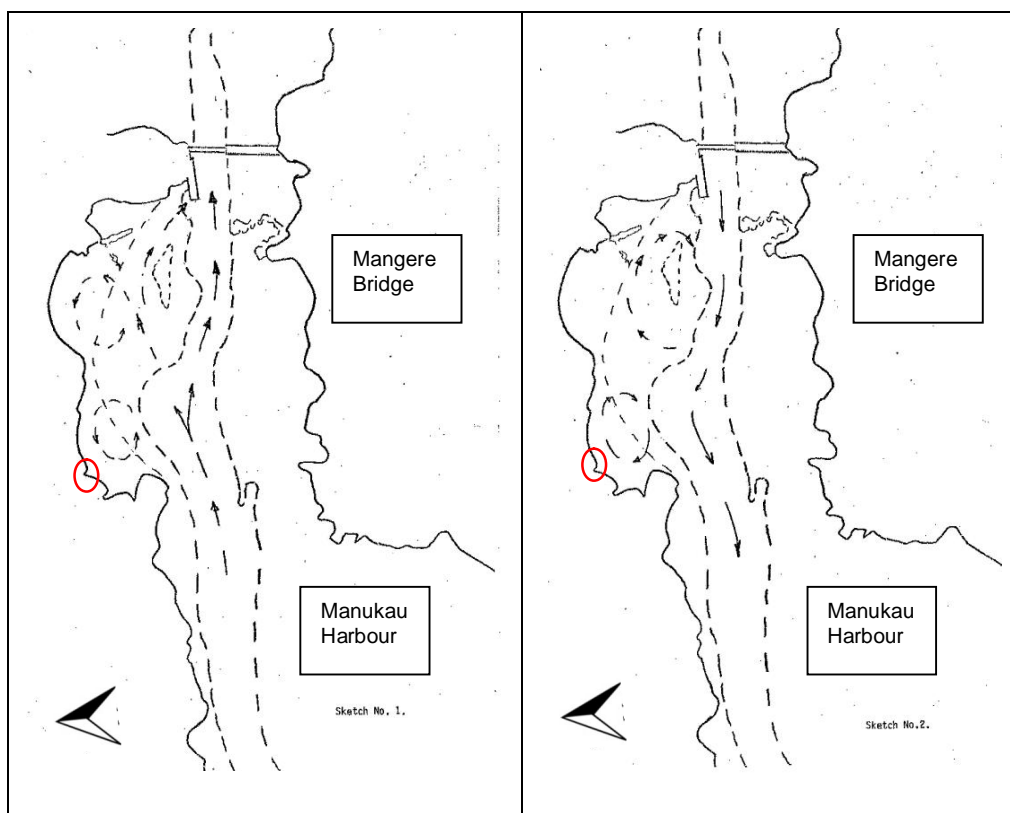
Event		CD, m	RL (LINZ) m
Highest recorded level (21/06/1947, 31/07/1965)	HRT	4.95	2.75
Recent storm (24 Jan 2011)		4.67	2.47
Highest Astronomic Tide	HAT	4.54	2.34
Engineering High Water	EHW	4.4	2.20
Mean High Water Springs	MHWS	4.20	2.00
Mean High Water Neaps	MHWN	3.38	1.18
Mean Sea Level	MSL	2.42	0.22
AVD-46 (Auckland 1946) datum	RL	2.201	0.00
Mean Low Water Neaps	MLWN	1.37	-0.83
Mean Low Water Springs	MLWS	0.49	-1.71
Lowest Astronomic Tide	LAT	0.09	-2.08
Chart Datum	CD	0	-2.20
Notes: CD = Chart Datum at Onehunga			
AVD - 46 datum = 1946 Mean Sea Level			
MHWS = level exceeded by 10 to 12 % of high tides			
HAT = Highest predicted to occur under average meteorological conditions during the period 1/01/2000 to 31/12/2018			
EHW established prior to 1983			

The Manukau Harbour is a large, tidally controlled inlet that opens to the sea via a relatively narrow and deep channel. The tide range in the harbour is around 1.9 m (neaps) and 3.8 m (springs) and the volume which flows out of the harbour between low and high tide is 450 million m<sup>3</sup> (neaps) and 690 million m<sup>3</sup> (springs). Tidal flows dominate over freshwater inflows and the mean residence time of water in the harbour is in the order of 20 days (T&T, 1986).

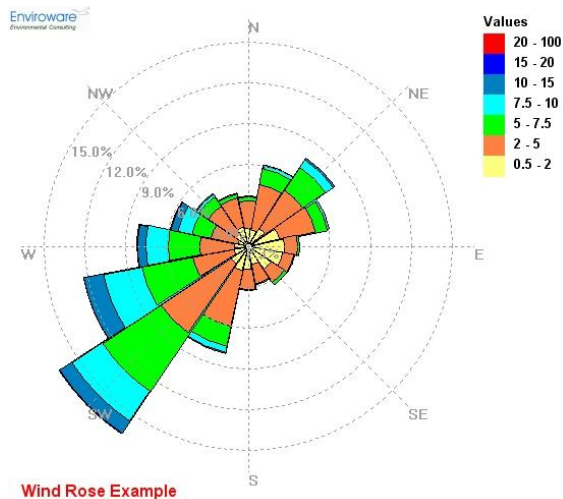
Tidal circulation within the Manukau Harbour is dominated by five major channels draining extensive intertidal and sub-tidal shallows. The Papakura Channel is the central major channel flanked to the north and south by smaller drainage basins. Wairopa Channel is the main navigation channel to Onehunga and is the shallowest of the major channels. Flow is confined mainly to the channel and is dominantly parallel to the channel margins. At Onehunga Wharf tidal velocities are higher during flood conditions than during ebb tides (T&T, 1986).

A hydrographic study was carried out within Onehunga Bay by the University of Auckland for the original motorway study (Raudkivi, 1975). Tidal currents were assessed based on observation and float testing. It was identified that the currents in the shallow tidal flats were controlled largely by the flows in the main channel to the Mangere Inlet and typically an order of magnitude lower. Figure 9-2 shows the sketches of the resulting flood (1) and ebb (2) tide situation.

Raudkivi noted that the currents in the Manukau Harbour are very low and significantly affected by wind stress.



**Figure 9-2 Recorded flood (1) and ebb (2) tide flow patterns in the Manukau Harbour (source: Raudkivi 1975) (Approximate location of PS 23 site shown in red circle)**



**Figure 9-3 Wind rose from Auckland Airport hourly wind data from April 2002 to January 2010. (Source: NIWA Cliflo database)**

## 9.5 Geology

The geology and hydrogeology within the project area is described in the Groundwater and Surface Settlement Assessment (Part D Technical Report J) and is summarised below.

### 9.5.1 Geological setting

The geology of the Auckland Isthmus is dominated by the weak sandstones and mudstones/siltstones of the Waitemata Group. The most common is the East Coast Bays Formation (ECBF) of the Warkworth Subgroup. Tauranga Group alluvium deposits are typically located within the base and flanks of present day and paleo-drainage channels. The various deposits of the Auckland Volcanic Field (AVF) occur over a wide area, but are largely limited to basalt flows or a mantling of tuff and ash. Mesozoic basement rocks underlie the entire Auckland urban area; although within the isthmus it is at a depth of approximately 400 m to 500 m.

A number of boreholes have recently been drilled in the area of the proposed tunnel corridor and results, along with historic investigation data and published geological information, provide information on the geology along the tunnel route. Sources of data included information from the Waterview Connection, SH20 Motorway extension, and Project Manukau (Mangere WWTP upgrade) projects.

### 9.5.2 Alignment geology overview

The geology of the main tunnel alignment can be divided into three distinct zones:

1. **A Northern Zone** (Western Springs to Mount Roskill) with ECBF at tunnel level and surface geology dominated by Auckland Volcanic Field (AVF) basaltic flows, together with a variable cover of tuff. Depending upon the pre-eruptive topography, the AVF deposits either directly overlie Waitemata Group rocks or Tauranga Group alluvium. The main tunnel and link sewers 1 and 2 are within this zone.
2. **A Central Zone** (Mount Roskill to Hillsborough) with ECBF at tunnel level and outcropping ECBF rocks and minor Tauranga Group cover at the surface. The main tunnel and Link Sewer 3 is within this zone.
3. **A Southern Zone** (Manukau Harbour and Mangere) with ECBF as well as Kaawa and Puketoka Formation deposits at tunnel level, and surface geology dominated by AVF eruptive centres. The main tunnel and Link Sewer 4 are within this zone.



### 9.5.3 Geological units

A geological long section, showing the geology along the tunnel alignments, is provided in the drawing set (Part C) Drawing AEE-MAIN-20 to AEE-MAIN-22. The eight geological units of significance along the route are described in summary below:

#### A. Auckland Volcanic Field (AVF) Basalt

This consists of hard rock lava flows. In the Northern Zone basalt is from Mount Albert and Mount Roskill and in the Southern Zone from Mangere Mountain. The basalt overlies extensive reaches of the tunnel alignment, up to 30 m in thickness. The basalt is typically well jointed with a relatively high permeability rock mass.

#### B. AVF Tuff

Tuff comprises clayey to sandy silts with some gravels through to silty gravels. It is present in the Northern and Southern zones but is much less extensive than the basalt. It is present along the tunnel route in significant thicknesses around Mount Roskill and at Mangere, most notably forming the tuff ring around the Mangere Lagoon.

#### C. Estuarine sediments

Estuarine sediments are found in and around the Manukau Harbour and consist typically of silts and sands with variable shell, gravel and organic content.

#### D. Undifferentiated Tauranga Group Alluvium (TGA) and Upper (fine grained) Puketoka Formation (UPF)

On the Auckland Isthmus the alluvium is typically derived directly from the weathering and erosion of ECBF. Within the Manukau Lowlands much of the material is from non-ECBF sources. The alluvium typically consists of silts or clays with variable sand content.

The Puketoka Formation sediments are generally alluvial to shallow marine in origin. They occur extensively throughout the low-lying areas adjacent to the Waitemata and Manukau Harbours. They include a wide variety of material types ranging from clays to gravels, though the upper Puketoka Formation is generally silts and clays with variable sand content.

#### E. Lower (coarse grained) Puketoka Formation (LPF)

Lower, coarse grained (predominantly sand) deposits of Puketoka formation have been identified in the Southern Zone at Mangere.

#### F. Kaawa Formation

The Kaawa Formation deposits consist of poorly cemented sandstone and sands. They are only found at the southern end of the Southern Zone in the vicinity of the Mangere WWTP.

#### G. East Coast Bays Formation Rock

The ECBF rock is typically extremely weak to weak interbedded siltstones and sandstones. It underlies the entire route. The ECBF rock is generally volcanic-poor however it includes mixed volcanic-rich beds as well.

In some areas ECBF is more fractured than others. Generally ECBF close to explosion craters is expected to be more significantly fractured than material further away. Route investigations to date close to Mount Albert and Mount Roskill have not found this to be the case, but testing close to Mangere Lagoon indicates a zone of higher permeability ECBF.

#### H. Residually to Highly Weathered East Coast Bays Formation

Where the uplifted and eroded ECBF has been exposed at the surface a residual soil is present, typically less than 5 m thick. This material is typically a firm to stiff silt or clay with a variable sand content.

## **9.6 Groundwater regime**

The Auckland Isthmus is characterised by perched transient groundwater levels closer to the surface and a deeper more stable regional groundwater level within the ECBF. Groundwater measurements along the route indicate that conditions are broadly hydrostatic in most areas. The ECBF regional groundwater level typically reflects surface topography (in a subdued manner), with levels increasing at gradients in the order of 2-5% from the coast.

Within the ridges, groundwater seepage is typically dominated by vertical seepage patterns (including cascading perched systems), percolating to the deeper regional water table. In gullies seepage from ECBF rock supports stream base flow, or where historic gullies have been in-filled by more recent alluvial or volcanic deposits, groundwater concentrates in directional seepage along the paleo-valleys. Basalt deposits form surface aquifers within ancient gully systems and are typically permanently saturated only in the lower zones near the coast.

### **9.6.1 Existing groundwater resource**

There is a surface aquifer from Western Springs to Mount Albert. Aquifer uses include groundwater for potable supply, groundwater for industrial use, disposal of stormwater and springs for recreational use. Within 280 m of the tunnel alignment there are four consented groundwater takes, for irrigation of golf courses (Auckland Council and Akarana Golf Club), irrigation of a garden centre (Kings Plant Barn), and irrigation, washing and general use at Auckland Zoo.

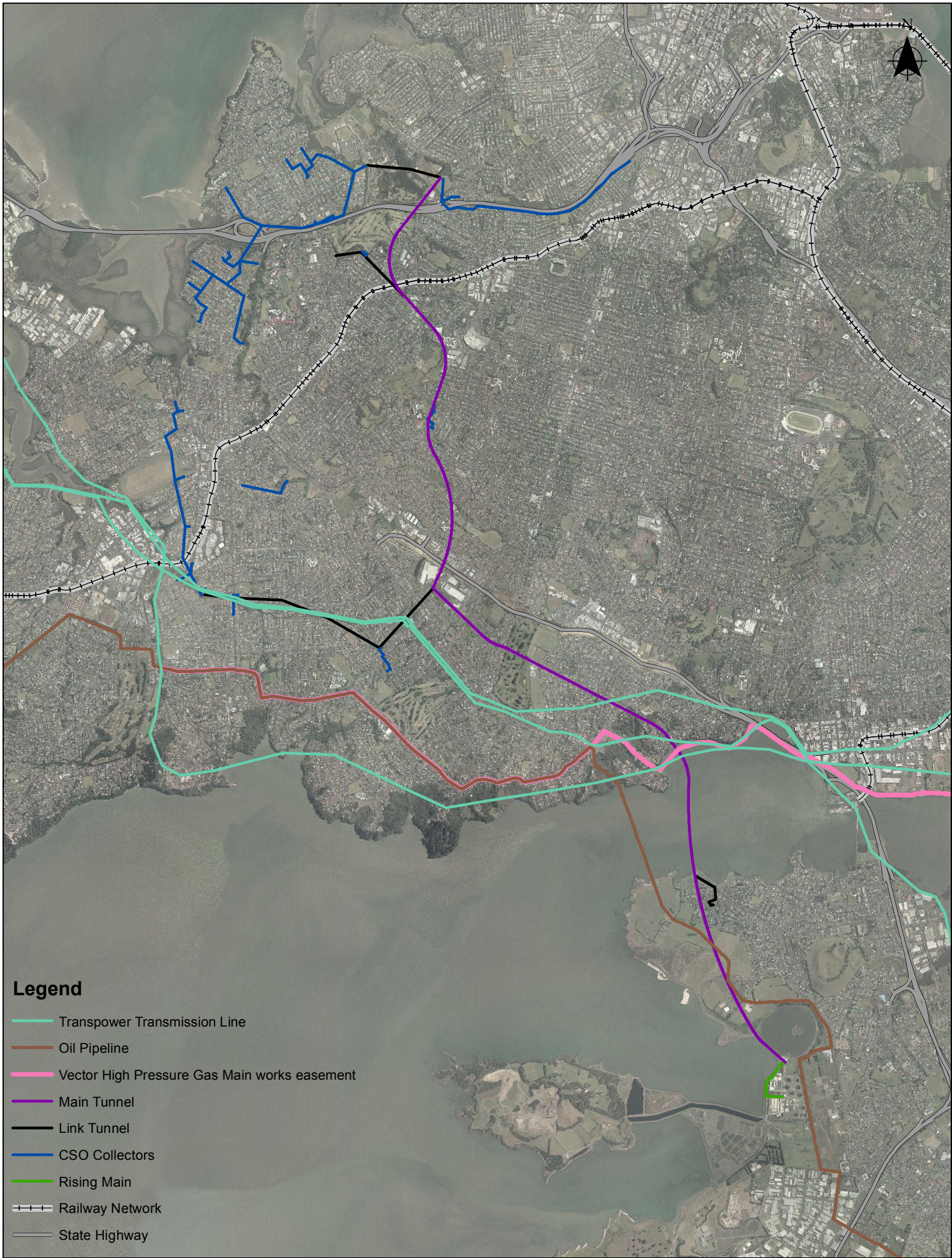
The Manukau Kaawa Aquifer is located in the Mangere area and the tunnel alignment terminates at the edge of this mapped regional aquifer. There are consented water takes (by Watercare) approximately 1100 m from the tunnel alignment for industrial/commercial uses.

## **9.7 Infrastructure and services**

Key infrastructure in the area above the tunnels includes SH 16, SH 20, the western rail line, the future Avondale-Southdown rail line (designated corridor), a Vector gas pipeline, and NZRC's Refinery to Auckland Pipeline. There are overhead power lines in the vicinity of the PS 23 (Frederick Street), PS 25 (Miranda Reserve) and Miranda Reserve sites. Other infrastructure and services at the construction sites will be identified and any issues addressed prior to construction where necessary. Key infrastructure is shown on Figure 9-4.



Path: P:\0538 - Central Interceptor Drawings\GIS\Map\05\_Consent\AEE AUGUST 2012\0102004\_08\_010\_01 and Major Infrastructure.mxd



### Legend

- Transpower Transmission Line
- Oil Pipeline
- Vector High Pressure Gas Main works easement
- Main Tunnel
- Link Tunnel
- CSO Collectors
- Rising Main
- Railway Network
- State Highway

Notes: This map is confidential and shall only be used for the purpose of this project. Map features depicted in terms of NZTM projection.	
Data Sources: NZ Topographical Features - LINZ NZ National Topo Dataset 2010 Cadastral Boundaries - LINZ NZ Cadastral Dataset 2011	
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Approved	A. Cederman Date: 17/08/2012
Designed	P. Fearon Drawn: P. Fearon
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## CENTRAL INTERCEPTOR and Major Infrastructure

AEE AUGUST 2012



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Map No:	60102004_08_010_01
Scale:	1:40,000 (A4 size)
Drawing No:	FIGURE 9.4
Rev:	A



## **9.8 Archaeological and cultural heritage**

Tangata whenua have a strong historical and cultural relationship with the land, water and harbours traversed by the Central Interceptor scheme. Watercare has identified 15 iwi groups with a potential interest in the project. Consultation has been occurring with iwi on the project and is ongoing, as described in Section 8 of this AEE.

Three key areas of archaeological interest have been identified along the route: Western Springs, Mount Roskill, and Ambury (refer Archaeological Assessment, Part D Technical Report D). It should be noted that, apart from at the construction sites, the works will be located at a significant depth below ground.

The first area of archaeological interest is Western Springs. Recorded sites relate to both Maori and European heritage. In this area there are five archaeological sites, one maritime heritage site, three military heritage sites, four historic structures, a brick findspot, and three Maori Heritage Sites (Wai Orea (Western Springs main lake), Nga Kauaewhati and Te Rehu), with other sites located in the wider area. Nga Kauaewhati and Wai Orea are scheduled Maori Heritage sites in the Auckland City District Plan.

The second area is Mount Roskill. Mount Roskill volcanic cone (Puketapapa) is a pa site with surviving pits and terraces. However, the surrounding area has been intensively developed and the only recorded evidence of occupation are a midden and a findspot. Mount Roskill is near the tunnel route but will not be directly impacted by the proposed work.

The third area is the Ambury area. It has a history of Maori and later Pakeha use. Evidence of Maori occupation and horticulture in the Ambury Park area is represented by numerous shell middens, stone heaps/mounds, stone rows, caves, terraces and platforms. There are over 70 archaeological sites within Ambury Regional Park recorded on the NZAA site database with 23 recorded sites close to the route of the main tunnel. The Ambury Park Stonefields are a scheduled Waahi Tapu in the Manukau District Plan (item 10, Schedule 6F) and the Ambury Park stone structures and stone walled enclosures are scheduled archaeological sites (items 6 and 8, Schedule 6G). Mangere Mountain is near the main tunnel route but will not be directly impacted by the proposed work. It is a pa site with visible terraces, ditches and banks and is part of the wider Maori archaeological landscape which includes Ambury Regional Park to the west.

There are two other sites located near the tunnel alignment; these are a maritime heritage site (Sheerlegs, CHI 269) in Hillsborough Bay, and a (destroyed) burial site in Mount Albert (R11/139).

Recorded archaeological sites are addressed for each construction site in Part B. It is noted that the only recorded archaeological site at the construction sites is at May Road, and this is recorded as having been destroyed. Effort has been made to avoid locating construction sites where they would disturb known heritage sites.

## **9.9 Ground contamination**

A desk top ground contamination study has been undertaken for the construction sites (refer Part D Technical Report I). Potentially contaminating activities that may have occurred at the sites have been identified through a review of Auckland Council files, historic aerial photos, and historic certificates of title. No known potentially contaminating activities have occurred at the Norgrove Avenue, Whitney Street, Dundale Avenue, or Haycock Avenue sites. At the other sites, potentially contaminating activities are known to have occurred and are likely to have affected shallow soils within the construction sites. Contaminants of concern will typically be metals and petroleum hydrocarbons, including any contaminants specific to industry type, e.g. volatile organic compounds if solvents have been stored on site, pesticides for horticultural sites, nitrates for wastewater overflows and asbestos containing material (ACM) for landfilled areas. Contaminant levels are unlikely to be at concentrations that would exceed human health criteria for recreational and/or commercial/industrial

land use. However, for some sites, contaminant concentrations could be above published background concentrations and/or the permitted activity acceptance criteria for the ARP: ALW.

Where refuse/landfill is likely to be present (Western Springs and Western Springs CSO Collector Sewer site, May Road, Motions Road, and Mangere WWTP), advance investigation has been undertaken to define the nature and extent of the material present. The key findings of testing at these sites are outlined for each site in Part B. In summary, an assessment against the applicable standards shows that at the Mangere Pump Station site metals concentrations in some samples exceeded ARP: ALW criteria and at Motions Road and Western Springs CSO Collector sites samples exceeded the criteria for benzo(a)pyrene equivalent concentrations. At all five sites the test results were below the applicable National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health (NES) contaminant standards but levels of some contaminants were recorded above defined background concentrations. Contamination at these five sites is further addressed in the site specific assessments in Part B and in Technical Report I of Part D.

The potential for contamination from the tunnelling works is extremely low because soils at the proposed tunnelling depths are likely to comprise natural ground. There is a low potential for works within the road corridors to encounter contaminated ground and/or groundwater (e.g. migration from neighbouring industrial or service station sites onto the adjacent road corridors). Confirmatory testing and management procedures if contaminated materials are encountered are provided in the SMP (Part D Technical Report I).

#### 9.10 Zoning and planning limitations

The zoning and planning limitations at the construction sites are set out in Table 9-3 below. The planning maps are contained in Technical Report D to this report. As designations are proposed at these sites the district plan notations are not relevant to determining resource consent requirements, but are noted because the zoning indicates the type of activity expected to occur at the site and the notations indicate the presence of particular features and existing designations.

**Table 9-3: Zoning and planning limitations at construction sites**

Site	District Plan Map	District Plan Zone	District Plan Notations	Regional Plan Notations
Western Springs	ACDPI C06	Open Space 3 Open Space 5 Open Space 2	C06-08 Council carpark designation C05-08 Concept Plan for Western Springs Stadium	ARP: ALW - Urban Air Quality Management Area
Western Springs (southern side of Great North Road)	ACDPI D06	Special Purpose 3 Business 1	A07-01 Motorway D05-04 Interchange control area	ARP: ALW - Urban Air Quality Management Area
Mount Albert War Memorial Reserve	ACDPI D05	Open Space 4	-	ARP: ALW - Urban Air Quality Management Area
Lyon Avenue	ACDPI E06	Special Purpose 2 Business 4	E05-24 Mount Albert Grammar School designation	ARP: ALW - Urban Air Quality Management Area

Site	District Plan Map	District Plan Zone	District Plan Notations	Regional Plan Notations
			E06-06 Wastewater purposes	
Haverstock Road	ACDPI E06	Special Purpose 2	E05-05 Mount Albert Research Centre E05-29 View Protection – Volcanic Cones	ARP: ALW - Urban Air Quality Management Area
Walmsley Park	ACDPI F06	Open Space 2	E05-29 View Protection – Volcanic Cones	ARP: ALW - Urban Air Quality Management Area
May Road	ACDPI G06	Business 4	-	ARP: ALW - Urban Air Quality Management Area
Keith Hay Park	ACDPI G07	Residential 5 Open Space 3 Road Reserve Special Purpose 3	F05-05 Proposed motorway/railway/road G08-05 railway purposes B08-04 Public roads	ARP: ALW - Urban Air Quality Management Area
PS 23	ACDPI H08	Open Space 2	H08-02 Wastewater purposes H05-04 Airport Approach Height Control B04-01 Coastal Management Area	ARP: ALW - Urban Air Quality Management Area  ARP: C (Map Series 1 Sheet 12) - General Management Area - Regionally Significant Landscape
Kiwi Esplanade	MDP 5	Public Open Space 2 Public Open Space 3	-	ARP: ALW - Urban Air Quality Management Area
Mangere	MDP 6	Mangere	Designation 144A	ARP: ALW

Site	District Plan Map	District Plan Zone	District Plan Notations	Regional Plan Notations
WWTP		Puhinui Rural		- Industrial Air Quality Management Area ARP: C - General Management Area
Motions Road	ACDPI C05	Open Space 4 Open Space 2	C05-10 Council carpark designation	ARP: ALW - Urban Air Quality Management Area
Western Springs Depot	ACDPI C05	Open Space 2		ARP: ALW - Urban Air Quality Management Area
Norgrove Avenue	ACDPI D05	Road Open Space 2	B08-04 Public roads	ARP: ALW - Urban Air Quality Management Area
Rawalpindi Reserve	ACDPI D05	Open Space 2	-	ARP: ALW - Urban Air Quality Management Area
PS 25 (Miranda Reserve)	ACDPI G03	Open Space 2	G03-03 Wastewater purposes	ARP: ALW - Urban Air Quality Management Area
Miranda Reserve	ACDPI G04	Open Space 2	-	ARP: ALW - Urban Air Quality Management Area
Whitney Street	ACDPI G04	Road	B08-04 Public roads -	ARP: ALW - Urban Air Quality Management Area
Dundale Avenue	ACDPI G05	Road	B08-04 Public roads	ARP: ALW - Urban Air Quality Management Area
Haycock Avenue	ACDPI G05	Residential 5 Road	B08-04 Public roads	ARP: ALW - Urban Air Quality Management Area
Link Sewer 4	MDP 5	Public Open Space 2 Public Open Space 3	-	ARP: ALW - Urban Air Quality Management Area



Site	District Plan Map	District Plan Zone	District Plan Notations	Regional Plan Notations
		Road		

The main tunnel will cross underneath the Manukau Harbour between the PS 23 site off Frederick Street on the northern side of the harbour to Kiwi Esplanade on the southern side. The Auckland Council Regional Plan: Coastal (ARP: C) Map Series 1 – Sheet 12 identifies the coastal edge around Hillsborough Bay as a Regionally Significant Landscape (Rating 5). Most of the area of the Harbour that the main tunnel crosses beneath is identified as General Management Area, with the southern area of the harbour adjacent to Kiwi Esplanade identified as a Coastal Protection Area 1 (No. 23b). As described in Schedule 3, this is due to the area's importance as a roost and feeding ground for international migratory and New Zealand endemic wading birds and the pahoehoe lava flows. For these reasons the Manukau Harbour (ID 7) and Mangere Mount Foreshore (ID 59) are identified as Areas of Significant Conservation Value. The ARPS identifies the Mangere Lagoon explosion crater (Map 2a Sheet 4) and the Manukau foreshore lava flows (Map 2a Sheet 1) as significant volcanic features. It also identifies (on Map 2 Sheet 3) the Manukau Foreshore (ID 134) and Mangere Lagoon (ID 138) as significant natural heritage areas. Ambury Park is identified in the ARPS as having a landscape sensitivity value 5 (Map 3 Sheet 3) and the Ambury Park Stonefields are on Schedule 6F of the Manukau District Plan.

The zoning of land above the tunnels (within the 40 m horizontal corridor) within the Auckland City District Plan area includes sites zoned Business 1 and 4, Open Space 1-5, Residential 2b, 5, 6a and 6b, and Special Purpose 2 and 3. Within the Manukau District Plan area sites above the tunnel are zoned Residential Heritage 6, and Public Open Space 2, 3, 4 and 5.

#### **9.11 Construction sites**

The existing environment in and around the construction sites is described for each site in Part B of this report.

## 10.0 Assessment of effects on the environment – overview and positive effects

### 10.1 Overview and structure of assessment

Sections 10 to 12 of this report provide an assessment of the potential effects of the Central Interceptor main project works on the environment. The sections are structured as follows:

Section 10: Positive effects.

Section 11: Effects arising from construction and ongoing physical presence of the tunnels.

Section 12: A summary of potential effects for each of the construction sites. The detailed assessment for these sites is contained in Part B.

Section 13: Mitigation and monitoring.

The assessment of effects draws on information contained in the following technical reports included in Part D Appendices A to K:

- Landscape and Visual Assessment (Boffa Miskell, Technical Report A)
- Arboricultural Assessment (Arborlab, Technical Report B)
- Assessment of Ecological Effects (Boffa Miskell, Technical Report C)
- Archaeological Assessment (Clough & Associates, Technical Report D)
- Traffic Impact Assessment (Traffic Design Group, Technical Report E)
- Noise Impact Assessment (Marshall Day Acoustics, Technical Report F)
- Vibration Assessment (Tonkin & Taylor, Technical Report G)
- Odour Assessment (Beca, Technical Report H)
- Ground Contamination Assessment (Tonkin & Taylor, Technical Report I)
- Groundwater and Surface Settlement Assessment (Tonkin & Taylor, Technical Report J)
- Erosion and Sediment and Stormwater Control Plans (SKM, Technical Report K)

### 10.2 Assessment of the positive effects on the environment

The Central Interceptor scheme presents an integrated and cost effective solution for the network, addressing capacity, asset duplication and overflow mitigation needs, and providing a framework for the ongoing operation of the network for the next 50 years and beyond.

Once completed, the Central Interceptor main project works will provide the following key benefits:

- Positive effects on public health and the environment through the effective operation of the wastewater network generally;
- The provision of capacity in the wastewater network for future growth and development on the Auckland Isthmus for the next 50 years and beyond;
- Asset security through the duplication of the lower section of the ageing Western Interceptor;
- Significant reduction of the major wastewater overflows into the Meola Creek catchment;
- Opportunity to further reduce existing wastewater overflows from the combined sewer system into urban streams and the Waitemata Harbour.

### **10.2.1 Benefits of the wastewater network**

Prior to the construction of the wastewater system in Auckland, untreated wastewater was discharged directly to freshwater and coastal receiving environments, resulting in considerable adverse effects on public health and degradation of the environment.

The development of a wastewater system, and subsequent significant improvements made over the years to the wastewater network and treatment systems have resulted in a significant reduction in the incidence of water-borne diseases, considerable improvements in water quality of freshwater and coastal environments, and avoidance of adverse effects on amenity caused by untreated wastewater.

The ongoing operation of the wastewater network has significant positive public health, social, environmental and cultural effects.

### **10.2.2 Network capacity**

The Three Waters Strategic Plan (Watercare, 2008) identified the need for additional trunk sewer capacity to provide for Auckland's growth.

Watercare has adopted the Auckland Council's medium growth population scenario (issued 9 May 2011) for its long-term strategic planning purposes. This scenario forecasts a population increase across the Auckland region from 1.48 million people to 1.75 million by 2022 and 1.95 million by 2031. There are around 1.26 million people connected to Watercare's metropolitan wastewater system. This is forecast to grow to 1.65 million people by 2031.

The capacity of the existing network is insufficient to cater for this predicted population growth. Based on current projections, the capacity of the Orakei Main Sewer will be insufficient to convey the normal daily wastewater flow in dry weather (dry weather flow) within 10 – 15 years. Additional interceptor capacity is required to provide for future population growth and to minimise the risk of daily dry weather overflows into the environment. The Central Interceptor main project works will provide the required network capacity for growth and development on the Auckland Isthmus for the next 50 years and beyond. This will support regional strategies to intensify urban development within the urban limits.

### **10.2.3 Asset duplication**

The main project works will duplicate the lower section of the Western Interceptor. As described in Section 4.2, the Western Interceptor has been subject to deterioration due to sulphide attack of the concrete. In particular, the lower section of the Western Interceptor through the Hillsborough Tunnel and the Manukau Siphon is showing serious signs of deterioration and is estimated to have between 15-25 years of life left before it needs to be replaced. As this part of the Western Interceptor continues to deteriorate, the risk of failure increases. The Central Interceptor tunnel replaces the Western Interceptor and therefore will provide Watercare with asset security for this critical infrastructure.

### **10.2.4 Overflow reduction**

Within the Central Interceptor catchment area there are some 122 active overflows which currently discharge in the order of 2,200,000 m<sup>3</sup> of untreated diluted wastewater to the environment each year. These overflows affect the natural and ecological values of Motions Creek, Meola Creek, Oakley Creek, Whau Creek, and the coastal waters around Point Chevalier and the Waterview Inlet, creating potential public health risks for recreational users, and reducing the amenity and cultural values of the waterbodies. With ongoing growth and development these overflow quantities and the associated effects will continue to increase.

The Central Interceptor main project works will achieve significant overflow reduction in the Meola Catchment. The works will address Watercare's largest overflows, which are located on the

transmission network in the Meola catchment. In summary, the overflow reductions achieved by the main project works will provide the following environmental benefits:

- **Public health** - The significant reduction in wastewater overflows will reduce potentially harmful pathogens reaching the Meola Creek and Meola Creek estuary and associated coastal waters.
- **Ecological values** – The significant reduction in network overflow discharges will result in a range of ecological benefits in Meola Creek and Meola Creek estuary. These will include reduced nutrient and organic loads, improvements in water quality, and reduction in the likelihood of conditions that cause ecological stress and adverse ecological change.
- **Amenity values** - Watercare's two largest network overflows discharge to the head of Meola Creek, adjacent to Mount Albert Grammar School and the Roy Clements Treeway walkway. Other significant overflows occur further downstream. These overflows adversely affect the amenity values of these public areas, reducing aesthetic and recreational values. The main project works will significantly reduce the level of overflow to the Meola Creek, and will enhance amenity values.
- **Cultural values** – Watercare recognises the importance of land and water resources to tangata whenua. The proposed Central Interceptor main project works will result in a significant reduction in the volume and frequency of network overflows and will significantly reduce the volume of wastewater contaminants reaching Meola Creek and the associated degradation of this waterway. The works will greatly assist in the restoration of the mauri of this waterway and associated coastal waters.

The Central Interceptor main works also enable the construction of the CSO Collector Sewers, which in turn generates public health, ecological, and amenity benefits for Whau, Oakley, and Motions Creeks.

The proposed Central Interceptor main works will be integral to the ongoing operation of wastewater network on the Auckland Isthmus over the next 50 years and beyond. The wastewater network enables the communities of Auckland to provide for their ongoing health and wellbeing, and for continued economic growth and development across Auckland.

## 11.0 Assessment of effects on the environment – tunnels

### 11.1 Introduction

This section assesses the effects arising from construction and ongoing physical presence of the tunnels. The identified potential effects are:

- Hydrogeology and ground settlement effects;
- Effects on ground stability;
- Vibration effects;
- Noise effects;
- Effects on services;
- Effects on land use and property above the tunnels;
- Archaeological effects;
- Geological effects;
- Maori and cultural heritage effects;
- Effects of earthworks; and
- Effects in the CMA.

The effects at each of the construction sites are addressed in Section 12.0 and Part B. The technical reports in Part D provide further detail in relation to potential effects.

### 11.2 Hydrogeology and ground settlement effects (Part D, Technical Report J)

The hydrogeology and ground settlement effects are addressed in detail in Technical Report J of Part D. The findings of that assessment are summarised below.

#### 11.2.1 Tunnels

##### 11.2.1.1 General assessment

Groundwater modelling has been carried out to predict the likely extent and magnitude of effects of the proposed tunnelling on groundwater and a summary of these results is contained within the following sections. The modelling allows for the estimation of effects including potential for lowering of the groundwater table and changes to groundwater pressures. The models also estimate the quantity of flow that will be collected by the tunnels during construction and when complete.

The tunnels will be constructed through different materials along the route and at different depths. A range of conditions and construction options have been assessed to consider the extent and magnitude of groundwater effects in different ground conditions.

To calibrate the models, data from the site investigations outlined in Section 9.5.1 have been used, along with data gathered from other projects, including the recently completed Hobson Bay and Rosedale Sewer tunnels and the Vector tunnel project. The latter involved tunnelling through similar geological environments as that expected for much of the Central Interceptor main tunnel and link tunnels. Data collected during dewatering of the Three Kings Quarry, also in a similar geological environment has also been used.

In summary, tunnels of similar configuration to those proposed for the Central Interceptor main project works have been constructed in the Auckland Isthmus recently without significant groundwater or surface settlement effects. The construction of the Central Interceptor tunnels is likely to be undertaken in a manner that results in similar effects given the tunnel size and geological conditions in this area.

Data from previous projects and the results of analyses carried out for the Central Interceptor main works project identify that the magnitude and extent of groundwater effects and resulting surface settlements are a function of tunnel design and tunnel construction methodology. The ground conditions, permeability of the tunnel liner, and the length of time between excavation and installation of the liner are relevant factors.

Estimates of groundwater seepage into the tunnels for the different types of ground conditions are set out in Table 11-1 below. The modelling indicates that particular construction methods may be necessary in some ground conditions, but this is consistent with the proposed construction methods described in Section 6, with the tunnel liner being installed behind the TBM or MTBM as it moves forward, and the use of an EPB TBM or similar method for the main tunnel construction.

Computer models indicate that in typical ECBF with the proposed methodology which involves construction of the liner simultaneously with excavation, there is likely to be little impact on existing groundwater levels above the tunnel alignment, both during construction and long term during operation. A measurable effect on groundwater pressures is expected to be limited to the material immediately adjacent to the tunnels.

Where the main tunnel is excavated in Kaawa sands and Puketoka Formation (in the Manukau Lowlands i.e. Kiwi Esplanade to Mangere Pump Station), modelling indicates that it may be necessary to excavate the tunnel using an Earth Pressure Balanced TBM or similar methodology to limit groundwater effects during construction. This methodology is proposed for the Central Interceptor main tunnel, with a low permeability liner being installed behind the tunnelling machine.

If highly fractured ECBF is encountered, models indicate seepage rates could be significantly higher than for typical ECBF materials. Should significant lengths of the tunnel encounter highly fractured ECBF (potentially present near Mangere Lagoon), the proposed construction methodology, with a low permeability liner being installed behind the tunnelling machine, would limit the magnitude and extent of groundwater effects.

Estimates of groundwater seepage into the tunnels are set out in Table 11-1 below.

**Table 11-1 Estimate of potential seepage into tunnel**

<b>Tunnel liner type</b>	<b>Tunnel in typical ECBF (Northern and Central Zone) (m<sup>3</sup>/day/m of tunnel)</b>	<b>Tunnel in highly fractured ECBF (Southern Zone) (m<sup>3</sup>/day/m of tunnel)</b>	<b>Tunnel in Kaawa sands and Puketoka Formation (Southern Zone) (m<sup>3</sup>/day/m of tunnel)</b>
Proposed liner design (i.e. low permeability)	0.02 - 0.04 <sup>1</sup>	0.02 - 0.04	0.02
Medium permeability	0.1 - 0.2 <sup>1</sup>	0.1 - 0.2	0.1
Unlined	0.2 - 0.4 <sup>1</sup>	40	0.6

1 - Range reflects ECBF at 40 m to 100 m below ground water level.

The total estimated long term (post construction) groundwater inflow for the 18 km of tunnels is estimated to be approximately 200 to 400 m<sup>3</sup> per day (excluding inflows associated with shafts).

#### **11.2.1.2 Settlement**

Settlement of the ground surface above a tunnel can sometimes result from changes in the groundwater pressure around it. As discussed above, models indicate that the level of the groundwater table above the main project works tunnels is unlikely to be significantly affected, but groundwater pressures may be subject to some limited change.



The magnitude and extent of any surface settlement will be directly related to the magnitude and extent of groundwater pressure changes around the tunnels. Computer models have been used to estimate the range of possible settlements that may occur, allowing for:

- Expected variability in geological conditions; and
- The range of groundwater effects predicted for different tunnel construction options, including the proposed construction method described in Section 5.2 and 6.5.

The nature of settlement of the ground surface may range from:

- Imperceptible (settlement within measurement error or masked by seasonal surface movements);
- Uniform over large areas (effects of groundwater change spread over wide area within uniform geology); or
- Locally variable (significant changes in groundwater response over short distances, or where locally highly variable geology is affected by groundwater changes).

The potential for settlement to result in damage to structures depends primarily on the differential settlement, not the total settlement. Differential settlement represents the change in ground surface slope between any two given locations that are settling by different amounts. For damage to occur to a structure it must be subject to differential settlement resulting in distortion of the structure. The greatest potential for distortion is at the centre of the trough (typically near the tunnel centre line).

A summary of estimated settlement for construction of the main project works tunnels with the proposed liner installed by the TBM (i.e. in a short timeframe as proposed) is presented in Table 11-2 below. The settlements presented are the highest estimated settlement on the analysis section (typically near the tunnel centre line, but this is somewhat dependent on the distribution of compressible materials in the analysis section). The figures presented in Table 11-2 are maximum predicted settlements. Where an EPB TBM is operating in closed mode, the potential for settlement would be reduced even further.

**Table 11-2 Estimated surface settlement due to groundwater changes for tunnel with low permeability liner<sup>3</sup>**

<b>Analysis Section<sup>1</sup></b>	<b>Estimated maximum surface settlement - low permeability liner installed by the TBM<sup>2</sup> (mm)</b>
Tunnel in ECBF (Northern Zone, between Western Springs and Mount Albert War Memorial Reserve) - main tunnel, chainage <sup>1</sup> 11,000 m	10
Tunnel in ECBF (Northern Zone, between Walmsley Park and May Road) - main tunnel, chainage 14,750 m	20
Tunnel in ECBF (Southern Zone, between Kiwi Esplanade and Mangere Pump Station) - main tunnel, chainage 21,500 m	5
Tunnel in Kaawa Sands in Manukau Lowlands (Southern Zone, vicinity of Mangere Pump Station) - main tunnel, chainage 23,200 m	50
Tunnel in ECBF (Central Zone – Link Sewer 3, between Miranda Reserve and PS 25) - link sewer 3, chainage 100 m	20
Tunnel in ECBF rock with mantle of residual ECBF. Tunnel at 40 m below groundwater level. (Central Zone)	10
Tunnel in ECBF rock with mantle of residual ECBF. Tunnel at 100 m	10

Analysis Section <sup>1</sup>	Estimated maximum surface settlement - low permeability liner installed by the TBM <sup>2</sup> (mm)
below groundwater level. (Central Zone)	
<p><sup>1</sup> Chainages are as shown on Drawing AEE-MAIN-20/21. The analysis sections cross the tunnel alignment at these points. Northern, Central and Southern Zones are described in Section 9.5.2.</p> <p><sup>2</sup> Use of an EPB TBM would be expected to reduce estimated maximum settlements.</p> <p><sup>3</sup> Additional settlement due to ground loss address below.</p>	

Differential settlement associated with the settlements is typically 1:2000 or flatter. The exception to this is the section through the Manukau Lowlands where higher differentials are indicated for a small area to the north of the main tunnel alignment near the WWTP associated with the geological boundary between volcanic surface deposits and Tauranga Group deposits. At this boundary differentials are estimated at approximately 1:600.

Another potential cause of settlement in some ground conditions is due to the ground settling around the space between the excavation and lining. In the Northern and Central zones (Western Springs to Hillsborough), with excavation in ECBF, settlement associated with ground loss during excavation is not expected to be measurable (1 – 6 mm). In the Southern Zone (Manukau Harbour and Mangere), through Tauranga Group materials, the proposed construction methodology is expected to be capable of limiting settlement that could potentially arise from ground loss during excavation to less than 10 mm (additional settlement on top of groundwater related settlement).

### 11.2.1.3 Effects of settlement on properties and structures

In the proposed location and with the proposed construction methodology, there is negligible risk of structural damage to buildings and services due to tunnel excavation and operation. The effects of settlement on buildings and other structures above the tunnel alignment will depend on the location of the structure within the settlement zone and on the differential settlements that affect the structure at that location. For damage to occur, the structure must be subject to distortions or tilting associated with differential settlements greater than the structure can tolerate. The historically accepted limit for more than minor damage to sensitive buildings is total settlements of more than 50 mm, with differentials of steeper than 1:1000. The tolerance of services, such as pipelines above the tunnel route, will depend on considerations such as gradient, material, and joint design.

Maximum estimated differential settlements over the width of the expected settlement zone are generally flatter than 1:2000 and are well below the levels that may be expected to cause structural damage, even to sensitive structures. Where higher differentials are expected north of the WWTP in the vicinity of the Mangere Lagoon, these levels are still below a level that would cause issues and no significant effects are expected as there are no surface structures in this area. Where the main tunnel is constructed in Kaawa Formation or Puketoka sands (Manukau Lowlands), it is expected that construction with the proposed EPB TBM (or similar machine) will control settlements to less than 50 mm. Similarly, sensitivity studies show that if significant zones of highly fractured ECBF are encountered, as is proposed, it may be necessary for the liner to be constructed within 7 days to limit surface settlement to less than 40 mm. With EPB TBM use, settlement in these conditions could be limited further.

Given the similar tunnel size, construction method, and geological conditions, the surface settlement effects are likely to be of similar magnitude to those from other projects undertaken in the Auckland Isthmus recently. For example, the Hobson Tunnel (tunnel diameter 3.5 m) resulted in mean measured settlements of less than 10 mm and maximum measured settlement of 30 mm. Similar mean measured settlement values were achieved for the Vector Tunnel and Rosedale Outfall projects, with maximum measured settlements all less than the 50 mm “limit”.

## 11.2.2 Shafts

### 11.2.2.1 General assessment

The Central Interceptor shafts are of varying size and depth, and pass through variable ground conditions. Modelling has been undertaken for a range of shaft sizes and ground conditions to predict the potential effects of shaft construction on groundwater. Analyses were undertaken for the shafts at each of the three primary sites. For the secondary sites, analyses were based on specific shaft sites (AS3 (Haverstock Road), AS4 (Walmsley Park) and AS7 (Kiwi Esplanade)) and a generic analysis representing a typical ECBF only model, that are considered representative of the range of geological conditions expected. Based on ground conditions, shafts at Western Springs Depot, Norgrove Avenue, Keith Hay Park, PS 25 (Miranda Reserve), Miranda Reserve, Whitney Street and Dundale Avenue are comparable to the Haverstock Road shaft. Shafts at Motions Road, Mount Albert War Memorial Reserve and Lyon Avenue are comparable to the shaft at Walmsley Park. Shafts at Rawalpindi Reserve, PS 23 (Frederick Street) and Haycock Avenue are comparable to the generic analysis.

Groundwater analysis has considered inflows in each shaft model and flows have been estimated for a lined excavation (i.e. with secant piles, diaphragm walls, or a caisson). Based on analyses of estimated groundwater inflows for a range of liner permeabilities, estimates of maximum potential short term construction inflows, and maximum long term operational inflows have been made for the shaft sites. Table 11-3 shows estimated long term groundwater inflows at the shaft sites.

**Table 11-3 Estimated long term groundwater inflows to shafts**

Shaft site <sup>1</sup>	Estimated long term groundwater inflows, (m <sup>3</sup> /day) for lined shafts (permeability 10 <sup>-09</sup> m/s)
WS1	25
WS2	65
WS3	25
AS1	20
AS2	20
AS3	15
AS4	20
AS5	15
AS6	15
AS7	10
L1S1	20
L1S2	15
L2S1	15
L2S2	15
L2S3	20

Shaft site <sup>1</sup>	Estimated long term groundwater inflows, (m <sup>3</sup> /day) for lined shafts (permeability 10 <sup>-09</sup> m/s)
L3S1	15
L3S2	15
L3S3	15
L3S4	15
L3S5	15

<sup>1</sup> Based on representative analyses as described earlier

For the shafts sites associated with the main tunnel (WS and AS shafts), maximum construction groundwater inflows are expected to be in the order of 50 to 220 m<sup>3</sup> per day if the shafts are unlined during excavation. If the lining is installed in concert with excavation, flows are likely to lower - in the order of 10 to 65 m<sup>3</sup> per day per site. At Western Springs (WS1), May Road (WS2), and AS7 (Kiwi Esplanade) the shafts will be lined in concert with excavation or some other appropriate methodology, to control inflows to 10 – 60 m<sup>3</sup> per day. For the shafts sites associated with the link sewer tunnels, maximum construction groundwater inflows are expected to be in the order of 50 to 150 m<sup>3</sup> per day if the shafts are unlined during excavation. If lining is installed in concert with excavation, flows are likely to be reduced to 10 to 20 m<sup>3</sup> per day per site.

#### 11.2.2.2 Effects of settlement on properties and structures

A summary of estimated settlement for construction of the shafts with and without a low permeability liner and with and without groundwater control construction techniques is presented Table 11-4 below.

**Table 11-4 Estimated maximum surface settlement for shafts**

Analysis Section	Settlement estimates without groundwater-control construction techniques (mm)		Maximum settlement estimates with groundwater-control construction techniques (mm)	Differential settlement flatter than: (all cases)
	No permanent low permeability lining installed	Low permeability lining installed within a year of excavation		
WS1 Western Springs	20	20	10	1:2000
WS2 May Rd	100	70	10	1:1000
WS3 Mangere Pump Station	N/A	N/A	40	1:2000
AS3 Haverstock Rd)	100	60	30	1:1500
AS4 (Walmsley Park)	90	90	10	1:1000
AS7 (Kiwi Esplanade)	100	100	10	1:1000
Generic	50	30	10	1:2000

As noted earlier in Section 11.2.1.3, for there to be risk of more than minor damage to sensitive buildings, it is estimated that total settlements of more than 50 mm, with differentials of steeper than 1:1000, would be required. The above results show maximum calculated differential settlements over the width of the expected settlement zone are all flatter than or equal to 1:1000 and are below the levels that may be expected to cause structural damage, even to sensitive structures.

As illustrated in Table 11-4, which shows estimated maximum settlement with and without groundwater control construction techniques, in some instances construction methodologies that allow control of groundwater effects are likely to be required. For WS3 (Mangere Pump Station) the anticipated construction methodology of diaphragm walling through the Kaawa sands unit to the underlying ECBF is expected to control potential settlement to less than 50 mm. Where shafts are excavated in ECBF overlain by Puketoka Formation within approximately 200-300 m of settlement sensitive structures (WS2 (May Road), AS 3 (Haverstock Road), AS 4 (Walmsley Park), and AS7 (Kiwi Esplanade), construction methodologies that allow control of groundwater effects are likely to be required. Design and construction methodologies have been proposed (e.g. secant piling, diaphragm walling, open caisson and/or basalt grouting or a combination of such methods) for shaft construction to provide the level of control on groundwater effects required. These measures will mitigate any potential effects on settlement sensitive structures.

### **11.2.3 Link Sewer 4**

Link Sewer 4 will be constructed by shallow (1 – 3 m depth) open excavations above groundwater level in basalt. As such there is no potential for groundwater drawdown, or associated surface settlement.

### **11.2.4 Potential effect on users of groundwater in the area**

Four groundwater users have been identified close to the proposed tunnel alignment - within 100 m of Link Sewer 1, and within 200 m of the main tunnel. All these users take water from high capacity basalt surface aquifers. Analyses indicate that groundwater drawdown within the ECBF as a result of tunnelling is very unlikely to have a measureable effect on flows in the aquifers, and by inference on the existing groundwater users. Observations from the monitoring of actual draw down that occurred during the Vector tunnel project support this finding.

As the tunnelling is unlikely to measurably affect flows in the aquifers it is also unlikely to affect waterbodies in the catchments. Link Sewer 1 passes near Western Springs Lake, which is not expected to be affected by groundwater level changes in the ECBF associated with tunnelling.

The Western Springs shaft WS1 and five access shafts in the northern part of the project are proposed to be excavated through, or in the vicinity of, the Western Springs Volcanic Aquifer. Groundwater modelling indicates that for shaft construction without any specific groundwater exclusion measures, groundwater drawdown in the aquifer could be expected for a distance of 200 m-300 m during construction, and in the long term. However, methods such as grouting will be employed to mitigate potential groundwater effects at sites where this is a potential issue.

Watercare operates three bores approximately 1 km south of proposed shaft WS3 at the WWTP, taking water from the Kaawa aquifer. If any element of the proposed works is to have an effect it would most likely be the shaft construction. However, the construction methodology proposed for the WS3 shaft will limit groundwater inflows and groundwater effects on wells at this distance are very unlikely.

The potential for seawater intrusion in aquifers has been considered and the modelling shows that the potential to establish an inland hydraulic gradient is extremely low. In the unlikely event of temporary sea water intrusion due to construction, effects on groundwater users are not expected. Groundwater users in the northern and central zones typically draw water from the surface aquifers in basalt flows and these aquifers would not be affected even in the event that such temporary sea water intrusion occurred, as they are well above sea level. Where water is extracted from deep ECBF bores, they are significantly inland from the coast and would not be expected to be affected by temporary inland migration of the sea water/fresh water boundary.

### **11.2.5 Effect on groundwater quality post-commissioning**

The tunnels will be only partially full for most of the time the tunnel is in operation and the internal pressure will be lower than external groundwater pressure, therefore groundwater will tend to seep from the surrounding ground into the tunnel through the low permeability liner rather than out of the tunnel. Under these normal conditions there is no potential for wastewater to flow out of the tunnel and mix with groundwater.

The potential for an adverse effect on regional groundwater quality is considered negligible.

## **11.3 Effects on ground stability**

The tunnels may pass beneath land that has been identified by Auckland Council as being subject to instability. However, given that the tunnels will be located at depth and the results of the ground settlement assessment indicate very little settlement is expected, the proposed tunnels are not expected to have adverse effects on ground stability.



#### **11.4 Vibration effects (Part D, Technical Report G)**

The vertical alignment of the main tunnel has been located to remain in ECBF ground conditions along the route, maintaining clearance beneath the strong basalt lava flows and remote from any known volcanic vents. On the southern side of the Manukau Harbour, the geology is more complex and Kaawa sands and Puketoka Formation are present. All these materials are relatively low strength. In the ECBF rock and Puketoka Formation the TBM equipment will generally produce low level vibrations that would be expected to attenuate quickly and be below the perception threshold within 10 m for most people. The main tunnel is generally at a depth of over 25 m so there is unlikely to be any vibration effects on properties above the tunnel from tunnel boring. The rate of excavation is also expected to be high, averaging around 12 m per day. The time that any sensitive receiver would be subject to any vibration is therefore very short.

The link sewer tunnels (link sewers 1, 2 and 3) are expected to be excavated within weak ECBF rock. As for the main tunnel construction, the micro tunnelling methods proposed to be used for the excavation of these tunnels are expected to generate only low levels of vibration.

The vibration effects due to tunnelling are expected to be less than minor. Vibration effects are more likely to have the potential to occur at the construction sites and these potential effects are addressed in Section 12.9 and Part B.

#### **11.5 Noise effects (Part D, Technical Report F)**

Structure borne noise or reradiated noise is caused by vibrations travelling through structures and manifests as a rattle or hum. It is heard rather than felt, but is often difficult to distinguish from felt vibration. The effect depends on each structure and varies with building properties and material and ground type. It therefore varies considerably and it is not possible to predict with any accuracy where this may occur. In the rock expected to be encountered during tunnelling, the TBM will generally produce low level vibrations that would be expected to attenuate quickly and be below the perception threshold at the ground surface. Given the rate of tunnelling and the limited duration at any one location and the separation distances, any noise effects from tunnelling, including reradiated noise, would be no more than minor.

It is considered that the appropriate way to manage any effects of structure borne/reradiated noise, if experienced, is case by case through the complaint management procedures in the CNMP.

#### **11.6 Effects on services**

As noted in Section 9.7, infrastructure in the area above the tunnels includes SH 16, SH 20, the western rail line, the future Avondale-Southdown rail line (designated corridor), a Vector gas pipeline, and the NZRC Refinery to Auckland Pipeline. Due to the depth of the main tunnel and link tunnels underground, the tunnels are unlikely to occupy space in close proximity to other infrastructure and services. Potential settlement effects on services are discussed earlier and there is considered to be a negligible risk of structural damage. Due to the depth of the tunnels below ground the tunnels are not expected to have effects on future services, such as a future rail corridor. Consultation with network utility operators and transport authorities is underway, as outlined in Section 8.

#### **11.7 Effects on land use and property above the tunnels**

The main tunnel and link sewer tunnels will pass under properties in the Auckland Isthmus and Mangere Bridge. Due to the depth of the tunnels, the use and enjoyment of property above the alignment will not be affected.

#### **11.8 Archaeological effects (Part D, Technical Report D)**

As noted in Section 9.8 there are areas of archaeological or heritage significance in the vicinity of the tunnel alignment in some places (the Western Springs, Mount Roskill and Ambury Park areas). The

depth of the tunnels along the entire length is such that they are well below where archaeological remains are likely to be encountered.

### **11.9 Geological features**

The alignment of the main tunnel avoids the scheduled Mount Roskill (Puketapapa) site (Auckland City District Plan reference G06-04). The main tunnel corridor passes in the order of 20 to 25 m below the edge of the Mangere Lagoon and beneath the pahoehoe lava flow in the Mangere Bridge area. Geological features of interest are generally expressed at the surface. There are no geological features scheduled in the district plans on land at the construction sites. The tunnel will pass beneath the basalt and will not adversely affect geological heritage features. Geological features in the CMA are addressed in Section 11.12 below.

### **11.10 Maori and cultural heritage effects**

Mana whenua have a strong historical and cultural relationship with the land, water and harbours traversed by the Central Interceptor scheme. As noted earlier in Section 8 of this report, Watercare is engaging with iwi to discuss the wider Central Interceptor scheme and the potential effects.

Watercare's current understanding of the potential cultural effects associated with the Central Interceptor scheme (including tunnelling activities) is summarised in Section 12.6 of this report.

### **11.11 Effects of earthworks**

While the tunnelling may technically fall under the definition of "earthworks" in the Auckland City District Plan (and for the avoidance of doubt, resource consent is being sought), the only exposed surfaces will be at the construction sites. These effects are addressed in Section 12.13 and will be managed through the implementation of erosion and sediment control measures.

### **11.12 Effects of tunnel in the CMA**

The main tunnel will be located around 15 - 20 m below the seabed in the Manukau Harbour and Mangere Lagoon. At this depth the tunnel will not have any effect on shipping or public access.

There is potential for construction of the tunnel to result in some settlement of the seabed. The magnitude of sea floor settlement would be expected to be similar or less than that predicted on dry land (for equivalent construction methodologies) as the body of water above the sea bed is expected to provide recharge that is likely to buffer groundwater depressurisation in the compressible marine deposits on the sea floor. Any settlement that does occur is likely to be of an order that is not locally noticeable on mud flats, and there is not expected to be any impact on the natural processes within the intertidal or sub-tidal areas. Sediment redistribution as a result of wave action and tidal currents would be expected to rapidly fill in any minor feature that develops.

In the CMA adjacent to the Kiwi Esplanade site the area is identified as a CPA 1 and the pahoehoe lava flows are a noted feature. The main tunnel will be tunnelled under this, with approximately 10 m between the top of the tunnel and the bottom of the lava flow. Therefore effects on this geological feature are not expected. The tunnel alignment is near a recorded maritime heritage site (Sheerlegs, CHI #269) in Hillsborough Bay, but the works will not affect this site.

The CPA 1 area is also noted as a bird roost and feeding ground. The tunnel will be at depth through this area and therefore will not have adverse effects on avifauna. Given that marine organisms typically do not inhabit a depth of greater than about 0.5 m, the tunnel is not expected to have adverse ecological effects.

As noted in Section 11.6 the main tunnel crosses beneath the Vector gas pipeline in the Manukau Harbour. Due to the depth of the main tunnel underground the tunnel is not expected to occupy space in close proximity to these services. Potential settlement effects on services are discussed earlier and there is considered to be a negligible risk of structural damage.

### **11.13 Summary of effects**

The Central Interceptor main project works will have significant positive effects in providing network capacity for growth and development, addressing asset risk due to the ageing Western Interceptor, and reducing overflows to the stream environments in the catchments it serves.

The tunnels are not expected to affect properties above the alignment or archaeological or geological features and there is negligible risk of structural damage to buildings and services due to tunnel excavation and operation. The main tunnel will pass under the seabed of the Manukau Harbour, but will be at depth and any effects in the CMA will be negligible.

## 12.0 Assessment of effects on the environment – effects at construction sites

The assessment of effects for each of the 19 construction sites is contained in Part B, and is supported by the drawing set (Part C) and the technical reports (Part D). A summary of the effects at the construction sites across the project are outlined below. The effects at each site depend on the nature and size and duration of the construction activity, the proximity of the construction site to nearby properties and the nature of surrounding land uses. A number of the sites are in reserves and therefore give rise to potential effects on recreation and public access. Two sites (PS 23 (Frederick Street) and Mangere Pump Station) involve some works within the CMA.

Key actual or potential adverse effects that have been identified in relation to the construction sites are:

- Visual and landscape effects;
- Recreation and public access effects;
- Vegetation effects;
- Ecological effects;
- Archaeological effects;
- Maori and cultural heritage effects;
- Traffic effects;
- Noise effects;
- Vibration effects;
- Odour effects;
- Effects of works in the CMA;
- Contaminated sites effects
- Effects of stormwater during construction;
- Effects of permanent stormwater discharges;
- Effects of construction related discharges;
- Effects of activities in potential flood areas;
- Effects on ground stability; Effects on services; and
- Effects of Link Sewer 4 trenching.

Watercare has undertaken a number of other large projects, including Project Hobson, which involved similar tunnelling operations, and most recently, the South Western Interceptor extension in Manukau which involved micro tunnelling methods similar to those to be used for the link sewer tunnels.

Watercare routinely undertakes infrastructure works throughout the urban and coastal environments and as such, has significant experience with the management of construction activities, including the management of traffic and noise effects so as to minimise disruption during the construction phase.

### 12.1 Visual and landscape effects (Part D, Technical Report A)

The main visual and landscape effects will be temporary, resulting from the removal of vegetation, construction activity and vehicle movements. In most cases temporary adverse visual effects associated with the construction works will be able to be effectively screened by fencing around the perimeter of the construction area. At some sites structures will be visible above the fence, e.g. the noise enclosures at Western Springs and May Road. Vegetation removal will be mitigated by replanting and relocation of trees where practicable. At some sites (particularly Lyon Avenue and PS

25 (Miranda Reserve)) vegetation removal is more extensive and will require a period of establishment during which adverse visual effects will continue for a period, but will not be permanent. Temporary effects of a more than minor nature are expected on visual amenity and/or landscape character due to construction works at some sites (Western Springs, Lyon Avenue, Keith Hay Park, PS 23 (Frederick Street), Rawalpindi Reserve, PS 25 (Miranda Reserve), and Miranda Reserve). The effects at the other sites will be minor or less than minor.

Permanent structures will mostly be covers that are flush with the ground, but at sites where above ground structures such as air treatment facilities are, or may be, required (Western Springs, May Road, PS 23 (Frederick Street), and PS 25 (Miranda Reserve)), design principles will be taken into account during detailed design to mitigate adverse visual effects. Measures will also be taken to incorporate raised shafts and air vents into the landscape where these are required at PS 23 (Frederick Street) and Kiwi Esplanade. At Kiwi Esplanade this is proposed to be done by mounding and planting around the raised shaft and incorporating the vent into a new toilet block facility. Photomontages for key sites are contained in Part D Technical Report A. The effects of the permanent works will be neutral or less than minor at all sites apart from Lyon Avenue and PS 23 (Frederick Street). At Lyon Avenue there will continue to be minor adverse visual effects for a period of time while replanting matures. At PS 23 (Frederick Street) adverse effects on open space and landscape character will be minor and with appropriate design and planting the permanent works would be integrated into this setting over time.

## **12.2 Recreation and public access effects**

A number of the construction sites are within reserves or public open space. At these sites there will be some temporary effects on recreation and public access during construction. The site locations and layouts have been developed to minimise disruption within the reserves and where the construction sites impact on pedestrian accessways alternative access will be provided during the construction period. Generally the construction areas will only occupy a small proportion of each reserve. The impact will generally be in areas of passive use. However at Rawalpindi Reserve the works will occupy a large portion of the reserve, and at Miranda Reserve the works will involve the temporary removal of the playground. There will be limited impact on sports fields, for example at Western Springs, where the works will occur outside of the marked fields except for a short section of trenching.

Reinstatement of the parks and reserves will occur in discussion with the owners Auckland Council and Regional Facilities Auckland. Due to the long lead time for the project there is sufficient time to work with these owners and align reinstatement works with long term plans for the parks and reserves.

The permanent works will occupy space within the reserves but will not prevent the long term recreational and open space use of the reserves. Generally, visible permanent structures will involve covers that are flush with the ground. The sites where above ground permanent structures will be visible are Western Springs (air treatment facility), Kiwi Esplanade (raised shaft and air vent), and Pump Station 25 (Miranda Reserve) (air treatment facility).

CPTED principles will be considered in the development of the detailed design. Consideration will be given both to permanent facilities, such as the design of air treatment facilities in reserves, and to construction features such as layout of site fencing and management of graffiti.

The permanent works will have no more than minor adverse effects on recreation and public access.

## **12.3 Vegetation effects (Part D, Technical Report B)**

Some vegetation removal will be required to enable the construction works. Generally this will involve the removal of individual or small groups of trees, although at Lyon Avenue and PS 25 (Miranda Reserve) the removal of larger areas of vegetation will be required. At some sites works may occur in

close proximity to trees and pruning may be required. Where practicable, trees will be pruned rather than removed. None of the trees are individually scheduled in the district plans.

Tree protection measures will be identified as part of the Construction Management Plan (CMP). Relocation of some trees may be considered where practicable and agreed with the landowner. Site reinstatement will involve replanting at most sites, with details to be developed as part of the detailed design process in consultation with landowners.

#### **12.4 Ecological effects (Part D, Technical Report C)**

Most of the sites have low ecological value and the proposed works are expected to have less than minor ecological effects.

At PS 25 (Miranda Reserve) and PS 23 (Frederick Street) native skinks were observed and May Road, Mount Albert War Memorial Reserve, Lyon Avenue, and Motions Road are potentially of value as habitat for native lizards. With appropriate skink salvage operations in place the effects on native lizards are unlikely to be more than minor.

Three sites, Lyon Avenue, PS 23 (Frederick Street), and PS 25 (Miranda Reserve) contain areas of native vegetation of some botanical interest (although somewhat compromised by their generally weedy nature). No vegetation was identified as being significant in terms of s6(c) of the RMA. At these sites the ecological effects are expected to be greater than minor (moderate). However, with appropriate mitigation measures in place, including replanting and/or enhancement (e.g. infill planting) of existing bush areas, these effects can be mitigated.

Potential effects on bird life may occur through direct impacts (e.g. loss or degradation of habitat) or indirect impacts (e.g. effective loss of habitat as a result of noise). The PS 23 (Frederick Street) and Kiwi Esplanade sites provide some habitat for coastal birds, including some "At Risk" species. However, there is ample habitat outside of the construction footprints, and the proposed works are expected to result in no more than minor adverse effects on these species. At Kiwi Esplanade the potentially most disruptive construction activities, including trenching works, to the extent practicable, will be programmed to occur when shore bird numbers are at their lowest (August to early December).

Three sites (Lyon Avenue, PS23 (Frederick Street) and PS 25 (Miranda Reserve)) contain native vegetation, the loss of which could possibly affect birds at these sites. However, it is considered that ample alternative bush habitat is available at the latter two sites and the proposed works are expected to result in less than minor effects upon birds. At Lyon Avenue the proportion of the wider bush area to be removed is greater, although it is considered likely that the effects of displacement of resident birds would be minor.

There will be a temporary loss of intertidal habitat at PS 23 (Frederick Street) during construction due to the creation of a construction platform in the CMA. However, the area is small in comparison with the wider area and the effect can be mitigated by reinstating the CMA following construction with appropriately sized sediment. The works in the CMA at the Mangere Pump Station site are relatively limited in extent and are expected to have less than minor effect.

#### **12.5 Archaeological effects (Part D, Technical Report D)**

There are three areas of high archaeological or heritage significance (the Western Springs, Mount Roskill, and Ambury Park areas) in the vicinity of the proposed works. However, no known archaeological sites will be affected by the proposed works. There is one identified archaeological site (R11/57) at May Road, but this is noted as having been destroyed. At the construction sites within or near these areas, impacts on unrecorded subsurface remains are considered to be possible. Most works are within landscaped or modified reserves and roads where the discovery of unrecorded subsurface remains is considered unlikely.

Watercare intends to apply for a general authority to modify for the project overall under the Historic Places Act as a precaution and an Accidental Discovery Protocol will be prepared to set out



procedures to be followed if any archaeological remains, taonga or koiwi tangata (human remains) are discovered. Overall, the effects of the proposed works on archaeological values are likely to be less than minor.

## **12.6 Maori and cultural heritage effects**

### **12.6.1 Overview**

Mana whenua have a strong historical and cultural relationship with the land, water and harbours traversed by the Central Interceptor scheme.

Watercare is engaging with iwi to discuss the wider Central Interceptor scheme and the potential effects. The aim has been to share information to enable mana whenua to make informed decisions on the project based on a sound understanding of the works and the potential cultural effects, and to consider possible measures to avoid, remedy or mitigate potential adverse effects.

During the consultation process, iwi have been invited to provide feedback on the effects either verbally or in written form.

Watercare's current understanding of the potential cultural effects associated with the Central Interceptor scheme (as summarised below) is based on:

- Consultation with tangata whenua to date (refer Section 8 of this report);
- Advice received from the project's cultural advisors; and
- Archaeological Assessment in Technical Report D of Part D.

### **12.6.2 Potential effects on cultural values**

Potential effects on cultural values are summarised below. The issues noted may be expanded upon by iwi during further consultation and in any feedback provided. It is understood that the potential effects on cultural values include:

- Potential effects on the cultural values and significance of the Manukau Harbour, including its mauri, health, water quality and fisheries. Potential effects arising from:
  - Additional inflow of wastewater to the Mangere WWTP;
  - Ongoing discharges of treated wastewater from Mangere WWTP;
  - Ongoing overflow discharges from the wastewater network;
  - Ongoing discharges of urban stormwater contaminants;
  - Emergency pressure relief discharges from Mangere Pump Station to the Manukau Harbour foreshore;
  - Discharge of wastewater if existing Western Interceptor is damaged;
  - The location of a tunnel across the Manukau Harbour between Hillsborough and Mangere Bridge;
  - The location of an air vent in Mangere Bridge;
  - Construction works and permanent structures in Hillsborough Bay;
  - Discharges of contaminants during construction;
- Potential effects on the cultural values and significance of the Waitemata Harbour, including its mauri, health, water quality and fisheries. Potential effects arising from:
  - Ongoing overflow discharges from the wastewater network;
  - Ongoing discharges of urban stormwater contaminants;
  - Discharges of contaminants during construction.

- Potential effects on the cultural values and significance of freshwater streams, including their mauri, health, water quality and fisheries. Potential effects arising from:
  - Ongoing overflow discharges from the wastewater network;
  - Ongoing discharges of urban stormwater contaminants;
  - Discharges of contaminants during construction;
  - Reduced natural stormwater flows into streams;
  - Leakage from ageing wastewater pipes.
- Potential effects on the cultural values and significance of land resources. Potential effects arising from:
  - Works in cultural heritage and archaeological sites;
  - Accidental discovery of archaeological remains;
  - Ongoing overflow discharges from the wastewater network;
  - Leakage from ageing wastewater pipes.

Discussions with iwi have also canvassed positive effects arising from the Central Interceptor scheme including:

- The reduction of wastewater overflows into streams in the Waitemata Harbour catchment by approximately 80%;
- The replacement of the existing Western Interceptor under the Manukau Harbour between Hillsborough and Mangere Bridge, significantly reducing the risk of pipe failure once the existing pipe has been decommissioned ;
- Installation of new wet weather treatment facilities at Mangere WWTP to improve the quality of wet weather flows discharged to Manukau Harbour;
- Opportunities for stream daylighting / naturalisation at sites adjacent to Meola and Oakley Creek.

### **12.6.3 Discussion**

The future of the Mangere WWTP and the long term discharge of treated wastewater to the Manukau Harbour is understood to be the most significant cultural concern.

The Central Interceptor scheme provides increased capacity in the network to accommodate future urban growth and also enables existing wet weather overflows from the network to be collected and conveyed to the Mangere WWTP for treatment. The increase in flow arising from the collection of wet weather overflows via the Central Interceptor scheme represents less than approximately 2% of the existing volume treated at the Mangere WWTP.

As noted earlier in this report, the Mangere and Rosedale WWTPs will continue to be the main regional facilities for Auckland for the foreseeable future.

During development of the Mangere WWTP upgrading works (Project Manukau) in the mid to late-1990s, consideration was given as to how to manage the effects of the Mangere WWTP on the Manukau Harbour. At that time, there were no feasible options available to remove the discharge from the harbour altogether. Alternative options to the current discharge were assessed but were not technically feasible, unacceptable to the community, or unaffordable, and that remains the case today.

With no practical option but to continue to discharge to the harbour, Watercare committed to work progressively to restore the harbour by improvements at the Mangere WWTP and surrounding areas. Since the treatment plant upgrade in 2002, considerable success has been achieved and the condition of the harbour is now significantly improved. A specialist Microbiological Review Group, which reports independently to both Auckland Council and Watercare, has recently confirmed this.

Further improvements will continue to be made including the addition of new wet weather treatment facilities, as noted earlier in this report.

In the longer term, technology may allow treatment to sufficiently high standards that use for general urban supply may be possible, which could allow a start to be made to reduce volumes of discharge to the Manukau Harbour. Although use of treated wastewater for urban supply is technically feasible and has been adopted in some other countries (e.g. Singapore), it is acknowledged that there are social, cultural and economic constraints to this approach being readily accepted in New Zealand, at least for the present. At the current time, there is no certainty on any programme for implementation of this or any other alternative use or disposal of treated wastewater. Therefore discharges of highly treated wastewater will continue to the Manukau Harbour for the foreseeable future.

A further significant cultural effect that has been identified is the ongoing discharge of wastewater overflows from the network into freshwater streams and coastal waters. Existing overflows adversely affect the quality, amenity and mauri of the streams and coastal waters.

The reduction in wastewater overflows is an integral component of the Central Interceptor scheme. Once the overflows are reduced, the existing adverse effects will also be reduced. The project will provide important water quality benefits and therefore has positive effects on cultural values in this regard.

Many of the other matters noted in the bullet point summary on the previous page relate to the potential environmental effects of the physical works. Those environmental effects are assessed throughout this AEE. Watercare acknowledges the need to ensure that adverse environmental effects of its works are minimised. A number of measures to achieve this are either integrated into the project works (e.g. avoiding construction impacts on known archaeological sites) or will be implemented (e.g. erosion and sediment control measures to avoid discharge of potentially sediment laden or contaminated water into waterways).

Areas of significant cultural value located along or in the vicinity of the route include Western Springs, Ambury Park and the maunga of Owairaka (Mount Albert), Puketapapa (Mount Roskill) and Mangere. Tunnelling activities will occur at Western Springs and Ambury Park – in these locations the tunnel will be around 30 – 40 metres below ground level. The main tunnel will not pass beneath the maunga because the material beneath them would be difficult for the TBM to operate in.

The main tunnel will pass under the significant cultural landscape of Ambury Park. Nearby Mangere Mountain was once the site of large fortified Māori pa and the area within Ambury Park was used by Māori for gardening. The area also provided access to seafood (kaimoana) and canoe launching sites for the various iwi who lived in and around the pa. The proposed Central Interceptor tunnel will pass at depth well below the ground and the known archaeological features of Ambury Park.

Although there are no recorded archaeological sites at the proposed surface construction areas, there is also a potential for accidental discovery during works at those sites. Prior to construction, Watercare will prepare accidental discovery protocols in consultation with iwi and the Historic Places Trust. Surface construction sites where archaeological and kaitiaki monitoring are required will also be identified and monitoring implemented at those sites during surface works.

As the works proceed, there will be opportunities to recognise the cultural significance of sites in the reinstatement of the construction areas. For example, opportunities that have been identified include:

- Stream daylighting / naturalisation (in conjunction with others) at sites adjacent to Meola Creek (e.g. at Mt Albert War Memorial Reserve, Haverstock Road) and Oakley Creek (e.g. Walmsley Road, Keith Hay Park);
- Reinstatement planting with native species to link in with adjacent reserves or bush areas (e.g. at Western Springs, Lyon Avenue);
- Mitigation planting to improve riparian edges;
- Inclusion of interpretive signage to acknowledge site cultural history;

- Architectural design of permanent above ground structures.

At the time of finalising this AEE, discussions had not reached the stage of considering specific options that might address cultural issues associated with the Central Interceptor scheme. These discussions are continuing with the intention of fairly and reasonably recognising the kaitiaki interests of the mana whenua of this area.

## **12.7 Traffic effects (Part D, Technical Report E)**

There is potential for effects to occur due to traffic generated by construction activities. Traffic will be generated by activities such as delivery of materials and construction equipment, removal of spoil, and construction worker movements. Traffic movements will vary according to the activities that will occur at the site e.g. whether it is used as a launch or retrieval site for the TBM or MTBM, and the permanent structures to be constructed at the site. Movements will also vary during the phases of construction e.g. shaft excavation, tunnel excavation, and construction of permanent works. The types of vehicles expected include standard vehicles (such as worker vehicles) and heavy vehicles (typically large truck and trailer units for primary sites and single unit trucks with some large truck and trailer units at secondary sites).

Access arrangements and site layouts have been developed for the concept design, taking into account truck tracking curves and manoeuvrability. The effects of traffic movements at each of the construction sites have been considered and a range of site specific traffic management provisions have been proposed at sites to manage traffic effects. Prior to construction commencing, CTMPs will be prepared to address the detailed provisions for each site. Draft traffic management measures for those sites where the construction area extends into the road reserve (Whitney Street, Haycock Avenue, and Norgrove Avenue) have been prepared and are contained within the traffic impact assessment in Part D. With these measures in place, the proposed works are expected to have no more than temporary and/or minor effects on the surrounding roading network.

## **12.8 Noise effects (Part D, Technical Report F)**

Noise will be generated by construction equipment and activities at the construction sites. Noise generating activities will depend on the type of construction site and will vary throughout the construction period depending on what activities are taking place. Noise sources include machinery used for site establishment (e.g. for access roading, excavations etc), piling for shaft construction, shaft excavation, crane operation, removal of spoil, truck movements, and generator operation. Trenching activities are also likely to generate some noise but for relatively short periods of time. Construction noise levels have been assessed against the Construction Noise Standards. There will be periods of time, due to certain construction activities, where noise levels are expected to exceed the Construction Noise Standards. Where necessary, noise management measures will be employed in accordance with the Construction Noise Management Plan(s) (CNMP) to mitigate the effects of construction noise.

Mitigation measures mainly comprise noise barriers where necessary. At the May Road and Western Springs primary sites measures also include the use of noise enclosure sheds over shafts. Permanent buildings enclosing facilities including the Mangere Pump Station and air treatment facilities will require acoustic treatment to the walls, roofs and vents and will be designed so that openings face away from noise sensitive receivers as far as possible. Where blasting is necessary, controlled blasting techniques will be used to mitigate noise and vibration effects to acceptable levels.

Operational noise levels will typically be low. Potential noise sources include air treatment facilities (e.g. operation of fans), and the operation of drop shafts (the movement of water). Very little noise is expected from access shafts, though it may be possible to hear a slight noise in the immediate vicinity of the shaft from the flow in the tunnel or through the connection tunnel from the drop shaft.

As there are different operational noise standards applying across the different district and regional plans, one set of consistent standards combining the different plans is proposed and the operational

noise levels have been assessed against these (see noise impact assessment in Part D and the proposed designation conditions). Operational noise levels are predicted to be compliant with the noise limits at all sites with recommended noise mitigation measures in place where necessary.

## **12.9 Vibration effects (Part D, Technical Report G)**

Construction activities at the site have the potential to generate vibrations at a range of levels. The types of activities that may generate vibrations at the construction sites include digger and truck movements, building construction, site access construction, piling, shaft excavation, and trenching. The methods of construction and types of equipment selected will impact on the level of vibrations generated by the proposed works. Generally construction activities will produce low vibration levels. Shaft and manhole excavation is likely to generate some vibrations.

Excavation of basalt is expected to be the principal cause of vibrations in shafts. This could include vibrations from activities such as drilling, blasting and rock breaking. Basalt is likely to be present at Mount Albert War Memorial Reserve, Lyon Avenue, Walmsley Park, May Road, Kiwi Esplanade, Motions Road and Western Springs Depot, and may be present at Western Springs and Haverstock Road. Other activities at the construction sites include the construction of deaeration tunnels and excavations for the below ground permanent works such as chambers and connecting pipelines. The deaeration tunnels are at the same depth as the main tunnel/link tunnels and vibration levels are expected to be low. The other below ground works at the construction sites will in most cases require excavation in soft ground conditions. Some piling may be necessary for ground retention in some places.

Operational vibrations from drop shafts (based on measurements taken at the Victoria Avenue drop shaft) are expected to be generally low and not discernible to people beyond the shaft.

With suitable separation distances between source and receiver environments (as identified in vibration assessment in Part D) the vibrations are likely to be within the recommended vibration limit criteria. Activities such as piling and excavating through hard rock (basalt) require a greater separation distance. At those sites where this type of activity is required in relatively close proximity to structures or people, Watercare will implement appropriate measures to ensure that the effects of vibration are minor. Appropriate mitigation measures will be identified in the CMP and possible mitigation options are outlined in Section 13.1.8.

## **12.10 Odour effects (Part D, Technical Report H)**

### **12.10.1 Odour generation**

Wastewater odour is caused by a variety of chemical species, including hydrogen sulphide (H<sub>2</sub>S), organic sulphur compounds (e.g. mercaptans), organic amines and volatile organic compounds. Concentrations of these tend to increase with the age of the wastewater, especially under anaerobic conditions. During wet weather events, the wastewater will tend to be more diluted, causing less significant odour.

Odour can be released under turbulent flow conditions, for example at junctions, drop shafts and pump stations. If these are released to the atmosphere, odour issues can occur. The odour management strategy for the Central Interceptor works is described in Section 5.5.

In considering the potential odour effects of the works the "FIDOL" factors have been taken into account: frequency, intensity, duration, offensiveness and location. The operational facilities at each site and the proximity of sensitive receivers have been considered. The types of facilities and their potential for generating odour are set out in Table 12-1:

**Table 12-1 Odour potential at site facilities**

Facility	Potential for odour
Drop shafts	Low potential for adverse effects.
Access shafts	Low potential for adverse effects.
Connection and control chambers	Low potential for adverse effects.
Grit chambers	Overall potential for adverse effects moderate to high, but intermittent (around four times per year) and of short duration.
Air intakes	Overall potential for adverse effects low to moderate. Air normally goes into the system via these vents, but discharge of air may occur during wet weather events around 6 – 8 times per year.
Pressure relief air vent	Infrequent operation, around twice in five years, for short duration. Wastewater heavily diluted and less likely to generate odour than dry weather flow.
Air treatment facilities	Designed to mitigate potential odour effects from other parts of the system.
Pump station	Low potential for adverse effects.

### 12.10.2 Odour assessment

Overall, both during normal operation and during wet weather events, adverse effects due to discharges of odour from the main project works are expected to be less than minor. There are two exceptions to this where minor localised adverse effects may occur at times.

The first circumstance is where the discharge of moderately odorous air occurs at air intakes during moderate to severe wet weather events (if ATFs at May Road, PS 25 (Miranda Reserve) and Western Springs are not installed). As described in Section 5.5, Watercare proposes a staged approach to the installation of ATFs. Only the Mangere Pump Station and PS 23 (Frederick Street) facilities are proposed to be installed initially and Watercare will assess the need for facilities at May Road, PS 25 (Miranda Reserve) and Western Springs after an initial period of scheme operation, so if there is a problem, there is a plan to address this. This is consistent with the approach taken for Project Hobson, where an air treatment facility was installed at the pump station site but it has not been necessary to date to install additional air treatment facilities.

The second circumstance is during the routine emptying of grit traps when, due to the nature of the material being removed, odour discharges may occur for a short period of time. Grit traps are proposed for Motions Road, Western Springs, and PS 25 (Miranda Reserve) and there is an existing grit trap at Rawalpindi Reserve. This activity is of a short duration (only a few hours) and infrequent, and measures will be taken where practicable to minimise effects on receivers (such as programming timing of cleaning to minimise the number of people potentially affected).

Watercare has extensive experience in managing odour and operates numerous air treatment facilities and grit traps across the wastewater network. There are systems in place for managing the cleaning of grit traps to minimise odour effects. In this regard, the main project works are in many respects no different from Watercare's existing business-as-usual operations.

## 12.11 Effects of works in the CMA

There are two sites where works will occur in the CMA. These are at PS 23 (Frederick Street) where a temporary construction platform will be formed to facilitate construction works, and at the Mangere Pump Station site where an EPR structure will be constructed.

At PS 23, due to constraints in site size and layout a temporary construction platform is needed in order to construct the main tunnel and permanent site works. The platform will be removed following construction and the CMA reinstated and a seawall constructed. The works will not interfere with any existing public walkways and access will still be possible around the site at low tide. The coastline in this area is identified as a Regionally Significant Landscape and temporary adverse visual and landscape effects of a more than minor nature are expected to occur during the construction period. However, the platform will be removed and the CMA reinstated to remedy these effects in the long term. The ecological effects, as summarised in Section 12.4, can be mitigated through reinstatement. The effects of the construction platform on coastal processes<sup>6</sup>, apart from the temporary occupation of the seabed, are expected to be less than minor. The impacts of the temporary occupation can be managed as long as all the construction material is removed upon completion of the works.

The EPR structure in the CMA at Mangere will be located in a highly modified coastal edge environment and the effects of the structure on coastal processes are expected to be less than minor. As explained in Section 5.11.5 the likelihood of a discharge occurring is very low as it would require two low risk events to coincide i.e. a pump station failure combined with a significant storm event that used all available storage in the tunnel. If it does operate, flows are likely to result in the formation of a scour hole seaward of the outlet structure. This is expected to be a localised and relatively small scale effect and therefore of a less than minor nature. The ecological effects of the construction of the structure are also expected to be less than minor.

If the discharge occurs, the event would be expected to cause short term deterioration in ecological, aesthetic and public health water quality characteristics. No long term significant adverse effects would persist, and any effects would be expected to be quickly remedied through tidal flushing and natural degradation processes.

## 12.12 Contaminated sites effects (Part D, Technical Report I)

Desk top study results suggest that at five of the construction sites (Kiwi Esplanade, Norgrove Avenue, Whitney Street, Dundale Avenue, and Haycock Avenue) no known potentially contaminating activities have occurred. Potentially contaminating activities have occurred at the remainder of the sites and have likely affected shallow soils. Contaminant levels are unlikely to be at concentrations that would exceed human health criteria for recreational and/or commercial/industrial landuse. Hence, the potential for risk to construction workers and the general public is likely to be low. However, for some sites, contaminant concentrations could be above published background concentrations and/or the permitted activity acceptance criteria for the ARP: ALW. Measures such as testing of soil to establish contaminant levels and determine spoil disposal requirements prior to bulk excavation work will be undertaken so that construction work is undertaken safely and securely with minimal risks to the environment at the potentially contaminated sites. A draft SMP for the project has been prepared and is contained in Part C Technical Report I.

Samples have already been taken at the Western Springs, Western Springs CSO Collector, May Road, Mangere Pump Station and Motions Road sites. These are the sites where refuse/landfill was identified as being potentially present. The samples were found to contain contaminant concentrations above background levels. At the Mangere Pump Station site metals concentrations in some samples exceeded ARP: ALW criteria and at Motions Road and Western Springs CSO Collector sites samples exceeded the criteria for benzo(a)pyrene equivalent concentrations. Comparison of the analytical results from all five sites against the NES land use scenarios indicates that there would be no significant risk to construction workers during the proposed development works

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<sup>6</sup> Coastal process assessment completed by Tonkin & Taylor Ltd



and future on-site users. The works can be appropriately managed to mitigate effects using the procedures identified in the draft SMP.

### **12.13 Effects of earthworks and stormwater during construction**

Most of the earthworks undertaken for this project will be located below ground, and will not result in erosion and sediment control effects on surface receiving environments.

Surface disturbance will occur at the construction sites and where connections are made to the existing network. Impervious surfaces will also be created during construction for temporary access roads and building/laydown areas. Draft erosion and sediment and stormwater control plans have been prepared to manage works at the sites during construction. These are contained in Part B Technical Report K.

In considering appropriate treatment for each site, consideration has been given to the different phases of work (i.e. establishment and construction, as described in Section 6.9) and TP 90 guidelines, as well as TP 10 guidelines, have been considered. Appropriate treatment has been proposed accordingly, depending on the physical nature of the site, the duration of works, and the activities to be undertaken.

The construction sites are generally flat, minimising the potential for accelerated erosion from surface site disturbance. Further, level spreaders at the point of discharge to receiving environments will be used where required to minimise bank scouring / erosion effects on streams, estuaries and harbours. Sediment control and/or stormwater management devices will be appropriate for the area of works undertaken on each site, and will meet TP90 or TP10 standards as appropriate, ensuring suspended sediment and/or contaminant loadings are reduced to the extent practicable.

Further information on the potential effects at each surface construction site are detailed in Part B and Part D Technical Report K. Universal Soil Loss Equations (USLE) and stormwater volume calculations are contained in Part D Technical Report K.

Sites with significant temporary impervious areas (e.g. Mangere Pump Station and May Road) will use retention ponds to reduce peak runoff volumes and to allow for settlement of sediment. Where stormwater reticulation is available and runoff is likely to be significant, temporary discharges will be connected to the local stormwater pipe following treatment.

The following sites are near watercourses, and appropriate sediment control measures will be used to minimise effects on these. These sites are:

- Lyon Avenue (Meola Creek);
- Haverstock Road (Meola Creek, partly piped);
- Walmsley Park (Oakley Creek);
- May Road (connects to Oakley Creek);
- Keith Hay Park (Oakley Creek);
- Rawalpindi Reserve (Meola Creek);
- Norgrove Avenue (Meola Creek);
- PS 25 (Miranda Reserve) (Whau Creek); and
- Miranda Reserve (Whau Creek).

Three sites (PS 23 (Frederick Street), Kiwi Esplanade, and Mangere Pump Station) are near the CMA (Manukau Harbour).

For several sites, temporary discharges to streams will be required. These include Lyon Avenue, Motions Road, Rawalpindi Reserve, Norgrove Avenue, PS25 (Miranda Reserve), and Miranda Reserve. In each of these sites, the anticipated runoff volume discharged to the streams is not

expected to be significantly greater than existing overland flow. The sediment control measures will minimise sedimentation of these waterways. Where point discharge volumes have potential to cause erosion, a level spreader will be used.

Temporary stormwater discharge is also proposed to the Manukau Harbour (PS23, Kiwi Esplanade, and Mangere Pump Station). A level spreader will also be used for these discharge locations if required to minimise the risk of scouring and erosion.

Emergency spillways will be constructed to safely convey storm exceedance events, except where anticipated stormwater runoff volumes will be insignificant. This will reduce any potential flooding.

Further information for each site is provided in Part B and Part D Technical Report K.

#### 12.14 Effects of stormwater discharges from permanent works

While the permitted impervious area threshold will be exceeded by permanent works at some sites, the ground surfaces will be subject to low vehicle traffic volumes and there will be limited sources of contaminants. Appropriate devices meeting TP 10 requirements will be provided as outlined in Section 5.9 to ensure that the sediment and contaminant loading in stormwater discharge from these sites will be within appropriate limits (e.g. 75% TSS removal on a long term average basis). Stormwater volumes from these sites have been calculated for storm events:

**Table 12-2 Stormwater volumes during storm events**

Construction site	Discharges to	2 yr ARI V24 (m <sup>3</sup> )	10 yr ARI V24 (m <sup>3</sup> )	100 yr ARI V24 (m <sup>3</sup> )
May Road (WS2)	Existing open channel	401	686	1000
Mangere Pump Station (WS3)	Existing storm water pipe discharging to Manukau Harbour	715	1223	1783
PS25 (L3S1)	Stormwater reticulated service	120	205	299
Western Springs (WS1)	Stormwater reticulated service	176	301	439
Haverstock Road (AS3)	Existing open channel and overflow	81	138	201

The above volumes are not significant at the two year storm event, and are likely to be accommodated by the existing stormwater network. Larger storm events are also unlikely to generate significant stormwater flows from the sites. Detention systems are proposed where necessary to minimise peak flows. Scouring at any point of discharge is unlikely, but erosion protection works will be undertaken in the future should significant scouring be identified as an issue.

Permanent works from all other sites will generate negligible additional runoff compared to the existing situation. Stormwater runoff will be either discharged to adjacent grass or the road, entering existing overland flow paths captured by the stormwater network.

#### 12.15 Effects of construction related discharges

Some groundwater inflow into the tunnels and shafts is expected to occur during construction and will have to be removed and disposed of. Water used or exposed to any construction process (e.g. wheel wash, etc.) will be directed to a water treatment facility located on the site. As described in Sections 6.5.4 and 6.7, this will be disposed of either to a local watercourse, the stormwater reticulation or sewer. If necessary the groundwater will be treated to neutralise it or to reduce suspended solid levels prior to discharge, such as through the use of settlement tanks or flocculation if necessary.

In summary, the effects of the construction related discharges are expected to be no more than minor.

### **12.16 Effects of activities in potential flood areas**

The following construction sites are known to be located within flood hazard areas:

- Mount Albert War Memorial Reserve (10 year flood);
- May Road (10 year flood);
- Keith Hay Park (10 year flood, 100 year flood, potential overland flow path or low hazard flooding);
- Rawalpindi Reserve (10 year flood area adjacent to Meola Creek); and
- Norgrove Avenue (10 year flood area adjacent to Meola Creek).

Works at Walmsley Park will occur in close proximity to Oakley Creek. The construction works will be managed to prevent flooding of the tunnels or shaft excavations, e.g. through the use of sand bags around exposed excavations in storm conditions. Where necessary, permanent works will incorporate features to prevent water entering structures (such as ensuring chambers are sufficiently sealed). Any specific measures required will be developed during the detailed design phase.

### **12.17 Effects on ground stability**

Some of the construction sites have been identified on the Auckland Council Hazard Maps as having unstable/suspected ground. These sites are:

- Western Springs;
- PS 23 (Frederick Street);
- PS 25 (Miranda Reserve); and
- Dundale Avenue.

At the detailed design stage any specific engineering requirements will be worked out and implemented. Any proposed works will be undertaken following best practice engineering. At PS 23 (Frederick Street) and PS 25 (Miranda Reserve), it is proposed to install retaining walls as part of the proposed works.

Any ground stability issues will be addressed so that the works do not result in adverse effects on ground stability.

### **12.18 Effects on services**

The location of existing services has been considered during the development of the design to date and will be considered in more detail during the detailed design stage. Existing services at construction sites will be located prior to construction and avoided or relocated as necessary. At Miranda Reserve, PS 25 (Miranda Reserve), and PS 23 (Frederick Street) there are overhead transmission lines in the vicinity. The majority of the works will occur outside of the overhead line 12 m corridor. Where works are required within the corridor (e.g. connections to the existing network), measures will be implemented where required such as the use of smaller equipment, additional safety measures, and coordination with Transpower. Works will be undertaken in accordance with Transpower guidelines for managing activities near high voltage transmission lines and operating plant in the vicinity of Transpower power lines.

### **12.19 Effects of Link Sewer 4 trenching**

Link Sewer 4 is a smaller pipe required to connect the main tunnel to the existing network at Witla Court. Unlike the other link sewers which are proposed to be constructed using micro tunnelling techniques, Link Sewer 4 is proposed to be constructed using trenching methods. On the Link Sewer 4 route in the road reserve the works may occur in the vicinity of street trees, depending on the final location.

Link Sewer 4 is to be trenched through Kiwi Esplanade reserve and via road reserve to Witla Court. Due to the presence of basalt, where the trenching occurs in close proximity to houses mitigation measures will be implemented to control vibrations and minimise the risk of damage or disturbance at nearby properties. Potential mitigation measures are identified in Section 13.1.8. Vibration management measures will be addressed in the CMP described in Section 6.17.2.

The construction noise levels are predicted to comply with the Construction Noise Standard, but a mobile noise barrier may be required where trenching is in close proximity to dwellings.

The location of existing services will be determined prior to construction to avoid effects on other services within the road reserve.

Traffic management measures will be undertaken in order to minimise the effects on people and traffic. This will include providing alternative vehicle and pedestrian routes where necessary.

Part of Link Sewer 4 will cross the Kiwi Esplanade Reserve. This will result in temporary and short term effects on recreation and public access, and alternative pedestrian access will be maintained around the works. As the area provides roosting habitat for coastal birds, the trenching works will be programmed to occur when shore bird numbers are at their lowest (August to early December). With these measures in place, the effects on birds are expected to be no more than minor.

No evidence of midden was found in the vicinity of the proposed Link Sewer 4 at Kiwi Esplanade. If any archaeological deposits are present they would be beneath the fill. As for the other construction works, accidental discovery protocols will be prepared to set out procedures to be followed in the event of the uncovering of archaeological remains.

## **12.20 Summary of effects**

The Central Interceptor main project works will have significant positive effects in providing network capacity for growth and development, addressing asset risk due to the ageing Western Interceptor, and reducing overflows to the stream environments in the catchments it serves.

During work at the construction sites there will be a range of adverse effects within the immediate vicinity of the works areas, but these will generally be temporary and/or can be mitigated to an appropriate level with appropriate construction management or in the longer term. Once completed, the Central Interceptor and associated features will be predominantly underground, and temporary work areas will be reinstated in an appropriate manner. The ongoing effects of the permanent works will be no more than minor.

Where possible, adverse effects have been avoided or minimised through the design development process described in Section 7.3.2, by considering alternative site locations and layouts. Where adverse effects cannot be avoided or minimised through alternative sites, those effects will be remedied or mitigated. The following section summarises the proposed mitigation measures.

## 13.0 Mitigation and monitoring of effects

### 13.1 Mitigation

A number of measures are proposed to mitigate potential adverse effects and these differ for each construction site. Prior to commencement of works, a construction management plan or plans will be prepared which will address construction issues and mitigation measures and cover vibration management, noise management, traffic management, tree protection, archaeological site discovery protocols, erosion and sediment control, contaminated land management, and communications management.

Mitigation measures more specific to particular effects are addressed below. Site specific mitigation is set out in Part B.

#### 13.1.1 Landscape and visual

A number of measures are proposed to mitigate landscape and visual effects. The specific measures to be implemented will depend on the site, but generally include:

- Site reinstatement works, including regrassing, revegetation, landscaping, and reinstatement of facilities (such as park furniture) where these have been removed for construction;
- Where practicable, use of grass cell or similar for permanent access areas to provide all weather vehicle access whilst reducing visual impacts;
- Perimeter fences around main construction works areas to screen construction activities and protect public health and safety. These fences may themselves have some visual effects and where appropriate it may be possible to incorporate measures such as murals or information boards to mitigate these effects;
- Incorporation of appropriate urban design and CPTED (Crime Prevention Through Environmental Design) principles in the design of temporary pedestrian accessways and permanent facilities such as air treatment facilities;
- Removal of the temporary construction platform at PS 23 (Frederick Street).

Reinstatement works in parks and reserves will be developed in conjunction with Auckland Council and Local Boards (or Regional Facilities Auckland at Western Springs and the Crown at Lyon Avenue) and the Landscape and Visual Assessment (Part D Technical Report A) contains potential options as a starting point.

#### 13.1.2 Recreation and public access

The construction sites have been designed to minimise effects on recreation and public access, for example by as far as possible locating sites outside of areas of high use or active recreation. Further mitigation measures generally include:

- Consideration of CPTED principles in design of construction site layouts and permanent works;
- Provision of alternative pedestrian/cycle pathways where existing pathways are impacted by construction works;
- Consideration of retention of mature trees where possible;
- Reinstatement works will be developed in conjunction with Auckland Council and Local Boards (or Regional Facilities Auckland at Western Springs and the Crown at Lyon Avenue) and seek to coordinate with long term plans for the parks and reserves. This will depend on the site, but may include replanting, restoration of pedestrian linkages, and/or integration with Auckland Council stream enhancement projects.

### **13.1.3 Vegetation**

Measures for mitigating effects of vegetation removal will depend on the circumstances and effects at each site. Mitigation may include the following measures, or a combination of these:

- Pruning rather than removing trees where practicable;
- Replacement planting at sites where trees have been removed;
- Where works are in close proximity to retained trees, use of tree protection measures where appropriate;
- Relocation of trees e.g. within council reserves, where practicable.

### **13.1.4 Ecology**

At sites identified as having or potentially having native lizards present (Mt Albert War Memorial Reserve, Lyon Avenue, May Road, PS 23 (Frederick Street), Motions Road, and PS 25 (Miranda Reserve)), a skink salvage operation is proposed to trap and relocate native skinks prior to construction commencing.

At Lyon Avenue, PS 23 (Frederick Street), and PS 25 (Miranda Reserve) replanting and/or enhancement (e.g. infill planting) of existing bush areas, is proposed to mitigate the ecological effects of vegetation removal. Options are addressed in the Ecology Report (Part D Technical Report C).

The temporary construction platform at PS 23 (Frederick Street) is proposed to be removed following construction.

### **13.1.5 Archaeology**

To manage the potential for the discovery of unrecorded archaeological remains, accidental discovery protocols will be developed to set out procedures in the event that archaeological remains, taonga, or koiwi tangata (human remains) are exposed during the works.

### **13.1.6 Traffic**

Construction traffic movements for each of the sites are described in Part B of the AEE. A range of site specific traffic management provisions have been proposed at sites to manage traffic effects. Mitigation measures to be generally implemented at each site are:

- Restricting heavy vehicles to the largest allowable truck size shown on the truck tracking curve diagrams;
- Ensuring construction truck routes generally avoid right turns and follow arterial routes as described in the traffic impact assessment report (Part D Technical Report E);
- Limiting truck movements outside of normal working hours; and
- Preparing a Construction Traffic Management Plan(s).

### **13.1.7 Noise**

Various measures are proposed to manage construction noise. Noise barriers will be installed at some construction sites where appropriate. These will be constructed early in the project where practicable. A construction noise management plan will be prepared to assist with the management of noise during construction. Mitigation measures that may be employed include managing construction hours for noisier activities, communication with neighbours, and use of less noisy construction methods where practicable. At the May Road and Western Springs sites enclosures will be constructed over the construction shafts to reduce construction noise levels. Where blasting is required, controlled blasting techniques will be used to keep noise to acceptable levels.

### **13.1.8 Vibration**

Mitigation of vibration will generally be through the management of construction to limit generation at the source. This would include measures such as maintenance of access roads to limit vibration from heavy vehicles, use of best practice controlled blasting methods, maintenance of equipment etc. If it is necessary to further limit the magnitude of vibrations, methods will depend on the situation, but may include measures such as:

- Use of an alternative method of construction;
- Isolation of the source (e.g. use of elastic or rubber packers beneath rails over critical section of rail);
- Construction of a vibration attenuation barrier between the source and receiver e.g. excavation of a trench, installation of a barrier or series of piles or open holes;
- Possible relocation of residents for the period when vibrations exceed tolerances;
- Modification of the affected building structure to change the response characteristics e.g. installation of bracing to modify the building response frequency; and
- Isolation of very sensitive equipment such as utilising an airbag or floating slab.

### **13.1.9 Groundwater and settlement**

The effects of the proposed works on groundwater and ground settlement will be largely managed through the use of appropriate construction methodology:

- Use of an Earth Pressure Balanced TBM or similar methodology (and/or ensure a suitably water tight liner is installed quickly following excavation) will help to limit groundwater effects during construction where the main tunnel is excavated in Kaawa sands and Puketoka Formation (in the Manukau Lowlands, just to the north of the Mangere Pump Station site) or in high permeability ECBF;
- Installation of tunnel liner to minimise groundwater infiltration into the tunnel;
- Use of appropriate shaft construction methodologies e.g. secant piling, diaphragm walling, open caisson and/or basalt grouting or a combination of such methods; and diaphragm walling methodology at WS3 Mangere Pump Station;
- Monitoring (refer Section 13.2).

### **13.1.10 Odour**

A combination of methods will be used to mitigate the effects of odour, as identified throughout the report. In summary these are:

- Maintaining the system under negative pressure during normal operating conditions;
- Installing primary air treatment facilities at Mangere WWTP and secondary air treatment facilities at PS 23 (Frederick Street) with provision for facilities to be installed later at Western Springs, May Road, and PS 25 (Miranda Reserve) if determined to be needed;
- Designing air intakes to minimise the potential for winds blowing across the vent creating venturi effects within the duct and drawing out odorous air;
- Managing the cleaning of grit traps, to reduce the potential for odour generation. Management measures could include:
  - Cleaning up of any spilt materials rapidly.
  - Timing maintenance to minimise disruption to nearby receivers (e.g. during the daytime in residential areas).



- Transportation of material removed from grit chambers in an enclosed vehicle to appropriately authorised disposal facilities.

### **13.2 Monitoring**

Monitoring measures, and contingency procedures and measures in the event of issues arising, will be included in the relevant sections of the CMP. Noise and vibration levels will be measured during critical phases of construction. Groundwater and settlement monitoring will be undertaken to measure the effects that construction has on the groundwater system around the shafts, tunnels and on ground surface levels above the tunnels. The CMP would contain procedures in the event that groundwater/settlement responses behave differently than expected or approach or exceed set trigger levels. Contingency measures will be identified and implemented as necessary.

## 14.0 Statutory context and assessment

### 14.1 Overview

The scope of the Notices of Requirement to designate land and the resource consents sought are set out in Section 2.0 of this report.

This section of the report assesses the proposed Central Interceptor main project works against the key provisions of the Resource Management Act 1991 (RMA) and comments on other relevant legislation. This section also assesses the project against the relevant provisions of the following statutory policy statements and plans:

- New Zealand Coastal Policy Statement 2010 (NZCPS);
- Auckland Regional Policy Statement 1999 (ARPS);
- Auckland Council Regional Plan: Coastal 2004 (ARP: C);
- Auckland Council Regional Plan: Sediment Control 2001 (ARP: SC);
- Auckland Council Regional Plan: Air, Land, and Water (ARP: ALW);
- Auckland Council District Plan (Auckland City Isthmus Section) 1999 (Auckland City District Plan); and
- Auckland Council District Plan (Manukau Section) 2002 (Manukau District Plan).

Other legislative provisions relevant to the project are discussed in Section 14.4. Other relevant documents are discussed in Section 14.6.

### 14.2 Resource Management Act 1991

The RMA sets out the legal framework for the sustainable management of natural and physical resources in New Zealand. The directly relevant sections of the RMA in relation to the assessment of the Central Interceptor project and the Notice of Requirement and consent processes are:

- Part 2 – Purpose and principles: sections 5 – 8 which establish the overriding purpose of the RMA and matters which all decision makers and persons exercising powers must provide for or have particular regard to;
- Part 6 – Resource consents: s104 which prescribes matters to be taken into account when considering resource consent applications and sections 105 and 107 which relate to discharge permits and coastal permits for discharges to the CMA; and
- Part 8 – Designations and heritage orders: specifically s168 which sets out the provisions for making a Notice of Requirement and s171 which sets out matters to be taken into account by the territorial authority when considering a Notice of Requirement.

An assessment against these parts of the RMA is presented on the following pages. In all cases, the assessment is based on the information presented earlier in this report and supported by the accompanying technical reports.

#### 14.2.1 Part 2 Purpose and Principles

##### 14.2.1.1 Section 5 – Purpose

Section 5(1) states that the purpose of the RMA is to promote the sustainable management of natural and physical resources, with sustainable management defined in s5(2). It is concluded that construction of the Central Interceptor will have significant positive effects, along with some adverse effects, most of which are only temporary or are minor, and that overall, the project will achieve the purpose of the Act. The reasons for this assessment are summarised below:

- The Central Interceptor main project works will form part of the bulk wastewater network of the Auckland Region and are therefore directly related to enabling the people and communities of the region to provide for their social, economic and cultural well-being and for their health and safety.
- In determining the preferred solution, a wide range of technical, environmental, social, economic and cultural matters were considered. This approach will also be taken in developing and finalising the detail of the proposed works, in consultation with key stakeholders.
- The development of detailed methodologies for construction and a CMP will ensure that the life-supporting capacity of air, water, soil and ecosystems are safeguarded.
- Any potential adverse effects arising from the construction, physical presence and operation of the Central Interceptor can be avoided, remedied or mitigated, as outlined in earlier sections of this report.
- Once commissioned, the Central Interceptor main project works will help to sustain the potential of natural and physical resources to meet the foreseeable needs of future generations by significantly reducing the overflow of wastewater into the natural environment and by providing for continued population growth to ensure that overflows do not increase in the future.

#### **14.2.1.2 Section 6 – Matters of National Importance**

Matters of national importance, which are to be recognised and provided for, are set out in s6 of the RMA. Relevant matters are:

- (a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:
- (e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.

The proposed surface works in the coastal environment (at the PS 23 (Frederick Street), Kiwi Esplanade and Mangere Pump Station sites) are located in modified environments. There will be temporary effects during construction but in the long term it is expected that the design of the permanent features will result in these features being appropriately integrated into the site settings.

Through reducing overflows the project will address one of the key concerns of tangata whenua groups, namely water quality. Watercare is engaging with iwi with an interest in the area to help identify any issues of importance to tangata whenua in relation to the proposed works. The issues raised are summarised in Section 8 of this AEE.

Reducing overflows into the natural environment will not only help to preserve the natural character of streams and the coastal environment, but also help to increase the quality of those environments in the future.

These matters are addressed in the objectives and policies of the relevant RMA plans and these are assessed in summary in Section 14.5 and in full in Technical Report B.

#### **14.2.1.3 Section 7 – Other Matters**

Section 7 sets out other matters to which particular regard must be had when exercising functions and powers under the RMA. The following matters are relevant to the project:

- (a) kaitiakitanga;
- (aa) the ethic of stewardship;
- (b) the efficient use and development of natural and physical resources;
- (c) the maintenance and enhancement of amenity values:

- (d) intrinsic values of ecosystems;
- (f) maintenance and enhancement of the quality of the environment.

Having regard to these matters, the following points are noted:

- Watercare is engaging with tangata whenua to help identify and address any potential effects of the project on tangata whenua. Selection of construction sites has considered the potential sensitivity of sites and tried to avoid any such sites as much as possible.
- The planning and design process has considered the efficient use and development of natural and physical resources and has resulted in the Central Interceptor main project works as the best practicable option.
- The project will help to ensure the efficient use and development of natural and physical resources by providing capacity to support growth within the existing urban Auckland area and through improving asset security of the regionally significant wastewater network infrastructure.
- Selection of surface construction sites and arrangement of layouts has considered effects on amenity and tried to avoid adverse effects where practical. Measures such as noise barriers and site fencing will help to mitigate construction effects on amenity, and design of permanent features and site reinstatement will also seek to maintain and/or enhance amenity values.
- The project will have significant positive effects on amenity values and on the values of stream ecosystems by reducing overflows of wastewater to the environment. This will help to maintain and enhance the quality of the environment and protect the intrinsic values of ecosystems.
- Measures are proposed at construction sites so that temporary effects on amenity values during construction and ongoing effects arising from permanent works are minimised or mitigated (refer Section 12.0 and 13.0 above and Part B).

#### **14.2.1.4 Section 8 – Treaty of Waitangi**

Section 8 requires those exercising powers or functions under the RMA to take into account the principles of the Treaty of Waitangi.

As described above, Watercare is engaging with iwi to help to identify any potential effects of the project on tangata whenua or cultural heritage matters. This consultation is ongoing.

#### **14.2.2 Part 6 Resource consents**

##### **14.2.2.1 Section 104 Consideration of resource consent applications**

Section 104(1) of the RMA requires a consent authority, when considering an application for resource consent, to have regard to any actual and potential effects on the environment of allowing the activity and the relevant provisions of statutory documents, along with any other relevant matters. The resource consents being sought for the Central Interceptor main project works are listed in Section 2.0 of this report.

Having regard to the matters outlined in s104(1) of the RMA, the following points are noted:

- Sections 10.0 to 12.0 and Part B consider the actual and potential effects on the environment. Those parts of the report address the positive effects of the project, potential adverse effects on the environment during construction and potential adverse effects occurring during operation of the Central Interceptor main project works.
- It is considered that with the implementation of the proposed management plans and mitigation measures as outlined in this report and the technical reports in Part D, these effects can be avoided, remedied or mitigated as required by the RMA to the extent that the effects are anticipated to be either of a no more than minor nature or are able to be appropriately mitigated in the long term.

- Capacity for future growth, security of the wastewater network, and reduced wet weather overflows are significant positive effects of the project.

The following sections of this report provide an assessment of the project against the relevant provisions of the applicable planning documents. In summary the proposed works give effect to or are considered to be generally consistent with the relevant objectives, policies and assessment criteria set in the relevant statutory and non-statutory documents referred to in s104(1)(b) of the RMA.

The resource consents can therefore be granted under s104.

#### 14.2.2.2 s104D

Before Auckland Council can reach a decision on an application for a non-complying activity under the provisions of s104, it must first address whether one of the two tests under s104D of the RMA can be met. These tests (in summary) are:

- s104D(1)(a) – that the adverse effects on the environment will be minor; or
- s104D(1)(b) – that the proposal will not be contrary to the objectives and policies of relevant plans.

Having regard to these tests, Table 14-1 contains an assessment in relation to the activities identified as non-complying activities in Table 2-2. These are the earthworks associated with the tunnel beneath the open spaces zones in the Auckland City District Plan area and the tunnel in the CPA 1 in the Manukau Harbour.

**Table 14-1 s104D assessment of non-complying activities**

Plan	Comment
Auckland City District Plan	<p>Earthworks associated with the tunnel excavation that will occur outside of the designation and that are not a permitted activity (i.e. trenching or works in the road reserve) in the Auckland City District Plan area are non-complying due to the rules in the Open Space chapter regarding earthworks volumes. However, the tunnels are located at a significant depth below ground and the earthworks will not have an adverse effect on the Open Space zoned sites above the tunnel alignment. The proposed tunnels are not expected to have adverse effects on ground stability. Effects of ground settlement are addressed by the provisions of the ARP: ALW.</p> <p>Overall, the works requiring resource consents under the Auckland City District Plan will not have more than minor effect and are not contrary to the objectives and policies of relevant plans as assessed in Section 14.5 and Appendix B of this Part A.</p> <p>Therefore, this application passes the tests of s104D(1)(a) and (1)(b).</p>
Auckland Council Regional Plan: Coastal	<p>The main tunnel passes beneath a CPA 1 and therefore becomes a non-complying activity. As assessed in Section 11.12 the tunnel will be located at depth below the seabed and is not expected to have adverse effects.</p> <p>The likelihood of a discharge occurring from the EPR is very low and it is necessary for safety and operational purposes.</p> <p>The works in the CMA at PS 23 (Frederick Street) involve the construction, use and removal of a temporary construction platform, the reinstatement of the CMA and placement of a permanent seawall, and associated disturbances and discharges. These works are expected to have a temporary effect of a more than minor nature, but this will be mitigated following construction of the tunnel and the ongoing effects are not expected to be more than minor.</p> <p>Overall, the works are not contrary to the objectives and policies of relevant plans as assessed in Section 14.5 and Appendix B of this Part A.</p> <p>Therefore, this application passes the test of s104D(1)(b).</p>

As the applications pass the test of s104D, the consent authority may grant the resource consents sought.

#### **14.2.2.3 Sections 105 and 107 matters relevant to certain applications**

Section 105(1) relates to matters relevant to applications for a discharge permit or for a coastal permit to discharge into the CMA. In summary, in considering an application to which s105 relates, the consent authority must have regard to the sensitivity of the receiving environment, the applicant's reason for the proposed choice and any alternatives. The discharge permits being sought for the project are set out in Section 2.3. The construction site related discharges, discharge of stormwater, discharges from works in contaminated sites, and discharges to air are of a minor nature and necessary to undertake the proposed works. The effects are addressed in sections 10.0 to 12.0 and alternatives are considered under Section 7.0 of this report. The likelihood of a discharge occurring from the EPR structure is very small and it is necessary for safety and operational purposes.

A wide range of alternatives have been considered as part of the process of developing the Central Interceptor scheme. In this regard, it is not possible for the discharges to occur to alternative receiving environments.

Section 107(1) provides that a discharge permit or coastal permit shall not be granted if, after reasonable mixing, the contaminant or water discharged is likely to give rise to any effects in receiving waters that would: cause conspicuous oil or grease films, scums or foams, or floatable or suspended materials; a conspicuous change in colour or visual clarity; emit objectionable odour; render fresh water unsuitable for farm animals; or have a significant adverse effect on aquatic life. As noted above, the discharges are generally of a minor nature and stormwater and construction site related discharges will go through some form of treatment prior to discharge. The likelihood of the discharge occurring from the EPR structure at Mangere Pump Station is very low and is necessary so that pressure can be safely released from the tunnel without causing damage to the pump station or tunnel structures or causing uncontrolled overflows from shafts along the tunnel alignment. If the emergency pressure relief discharge occurs, the event would be expected to cause a short term deterioration in ecological, aesthetic and public health water quality characteristics. No long term significant adverse effects would persist, and any effects would be expected to be quickly remedied through tidal flushing and natural degradation processes.

#### **14.2.3 Part 8 Designations**

##### **14.2.3.1 Section 168 Notices of Requirement to territorial authority**

Section 168 provides that a requiring authority may give notice in the prescribed form to a territorial authority of its requirement for a designation for a project or work. The scope of the Notices of Requirement are set out in Section 2.2 of this report. The notices have been prepared in accordance with s168 of the RMA.

##### **14.2.3.2 Section 171 Recommendation by territorial authority**

Section 171 sets out matters to be taken into account by Auckland Council when considering a Notice of Requirement. Having regard to these matters, the following points are noted:

- a) Relevant provisions of policy statements and plans: Refer Section 14.5 of this report.
- b) Consideration of alternatives: Refer Section 7.0 of this report.
- c) Necessity of the work and designation for achieving the objectives of the requiring authority: Refer Section 6 of the Notice of Requirement.
- d) Other matters: Various other matters are addressed within this report and the supporting documentation.

### 14.3 Notification sections 95A to F and 169

Sections 95 to 95F are relevant when a consent authority is considering whether a resource consent application should be considered with or without public or limited notification. These sections are also relevant to whether to notify a Notice of Requirement (s169).

The starting point under s95A is that a consent authority may, at its discretion, publicly notify an application. However, a consent authority must publicly notify an application if:

- a) it decides (under s95D) that the activity will have or is likely to have adverse effects on the environment that are more than minor; or
- b) the applicant requests public notification of the application; or
- c) a rule or national environmental standard requires public notification of the application.

In addition, a consent authority may publicly notify an application if it decides that special circumstances exist in relation to the application.

In accordance with s95A(2)(b), due to the nature and extent of the project, Watercare requests that the notices of requirement and applications for resource consent for the main project works are publicly notified.

### 14.4 Other relevant legislation

#### 14.4.1 Reserves Act 1977

The Reserves Act 1977 is administered by the Department of Conservation and provides for the acquisition of land for reserves, and the classification and management of reserves (including leases and licences). There are eight classes of reserve. Two of the most common in the Auckland urban area are local purpose reserves, which are held for the particular local purposes specified, and recreation reserves. The main purpose of recreation reserves is the provision of areas for recreation and sporting activities and for the physical welfare and enjoyment of the public and protection of the natural environment and beauty. The Minister of Conservation may, by gazette notice, vest the reserve in a local authority to hold and administer the land for the purpose for which the reserve is classified. The reserves at which works will take place, and their classifications are outlined in Table 14-2. These reserves are all owned by Auckland Council.

**Table 14-2 Reserve classifications**

Reserve	Classification*
Mt Albert War Memorial Reserve	For municipal buildings
Walmsley Park	Recreation reserve
Keith Hay Park	Recreation reserve
Kiwi Esplanade Reserve	Recreation reserve
Motions Road Reserve	Local purpose esplanade reserve
Rawalpindi Reserve	Recreation reserve
Norgrove Avenue	Recreation reserve
Miranda Reserve	Recreation reserve Local purpose esplanade reserve

\*as shown on Certificate of Title and/or Gazette Notice

Watercare will be separately seeking any other approvals required under the Reserves Act 1977.



#### **14.4.2 Historic Places Act 1993**

The purpose of the Historic Places Act 1993 is to promote the identification, protection, preservation, and conservation of the historical and cultural heritage of New Zealand. The Act regulates the modification of archaeological sites and makes it unlawful for any person to destroy, damage or modify the whole or part of an archaeological site knowing or having reasonable cause to suspect that it is an archaeological site. This is the case whether a site is registered or not. It provides for applications to be made to destroy, damage or modify an archaeological site(s). Under s12 a general authority can be applied for to cover all archaeological sites or class of sites within a specified area.

Although no known archaeological sites are expected to be affected by the works, a s12 authority will be sought as a precaution in case any unrecorded subsurface remains are exposed during earthworks or works in the CMA.

#### **14.4.3 Wildlife Act 1953**

The Wildlife Act 1953 protects most species of wildlife (including mammals, birds, reptiles and amphibians), native or introduced, and provides that no-one may kill or have in their possession any such bird or animal, unless they have a permit. As set out in this report, potential effects on wildlife, specifically birds and lizards, have been considered and mitigation measures provided where necessary.

#### **14.4.4 Hauraki Gulf Marine Park Act 2000**

The Hauraki Gulf Marine Park Act 2000 (HGMPA) recognises the national significance of the Hauraki Gulf and sets out objectives for the management of the Gulf, its islands and catchments. Under s9 a consent authority must have regard to s7 and s8.

Section 7 of the HGMPA provides that the interrelationship between the Hauraki Gulf, its islands, and catchments and the ability of that interrelationship to sustain the life-supporting capacity of the environment of the Hauraki Gulf and its islands are matters of national significance. Section 8 contains the objectives for the management of the Gulf.

The Central Interceptor main project works are partly within the Hauraki Gulf catchment and partly within the catchment of the Manukau Harbour. The project will result in environmental improvements in the Hauraki Gulf through the reduction in wastewater overflows to streams within the Hauraki Gulf catchment. With erosion and sediment controls in place the construction works are not expected to have an adverse effect on the Hauraki Gulf.

#### **14.4.5 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health**

The National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health came into effect on 1 January 2012. The NES sets planning controls and soil contaminant values that territorial authorities must give effect to and enforce. A ground contamination desk top study relating to the Central Interceptor main project works sites has been produced and further investigations have been undertaken at some sites (those suspected to contain landfill/refuse). A project wide resource consent is sought for the works as identified in Section 2.3.

While there are likely to be activities which are identified on the Hazardous Activities and Industries List (HAIL) on the surface of land above the tunnel alignment, these activities will be vertically remote from the proposed tunnelling activities. The NES applies to the particular piece of land affected by, or likely to be affected by, contamination. Accordingly, considering the separation distance of the proposed tunnelling from any actual or potential source of contamination within previously undisturbed ground, the NES requirements are not triggered in these circumstances.

#### **14.4.6 Utilities Access Act 2010**

The Utilities Access Act 2010 establishes a framework for a national code of practice to regulate how utility operators (including water and wastewater operators) and corridor managers (local councils, regional councils, New Zealand Transport Agency and KiwiRail) coordinate their activities relating to access to transport corridors. Under the Act, the National Code of Practice for Utility Operators' Access to Transport Corridors has been developed and came into effect on 1 January 2012. The Code seeks to minimise disruptions to roads, motorways, and railways caused by work by utility operators and maintain safety.

The proposed Central Interceptor works will be undertaken in accordance with the requirements of the Code and Corridor Access Requests will be sought from Auckland Transport, NZTA, and KiwiRail.

#### **14.4.7 Local Government Act**

Under the Local Government (Auckland Council) Act 2009 s64, Watercare has the powers under s181 of the Local Government Act 2002 for construction of works on private land. The Act sets out a process to follow prior to the exercise of this power.

The proposed Central Interceptor works will be undertaken in accordance with the requirements of s65 of the Local Government (Auckland Council) Act 2009 which gives Watercare powers to undertake works on roads and public land for the purposes of providing wastewater services.

### **14.5 Relevant RMA statutory documents**

This section of the report contains an assessment of the Central Interceptor main project works against the relevant statutory documents, as identified by s104(1)(b) and s171(1)(a). The relevant policy statements and plans are described, followed by an assessment against the key themes arising from each of these documents. This is supported by a full assessment of objectives and policies contained in Appendix B.

Many of the themes in the statutory documents reflect matters in Part 2 of the RMA or higher level statutory documents discussed above.

In all cases, the assessment is based on the information presented earlier in this report and supported by the accompanying technical reports.

#### **14.5.1 New Zealand Coastal Policy Statement**

The New Zealand Coastal Policy Statement 2010 (NZCPS), prepared by the Minister of Conservation, sets out objectives and policies in order to achieve the purpose of the RMA in regards to the coastal environment of New Zealand. The NZCPS 2010 took effect on 3 December 2010 and replaces the NZCPS 1994. It contains objectives and policies which include those aimed at safeguarding the integrity, form, functioning and resilience of the coastal environment and sustaining its ecosystems, and preserving the natural character of the coastal environment. Local authorities are required by the RMA to give effect to the NZCPS through plans and policy statements.

The NoRs and applications have been assessed against the objectives and policies of the NZCPS. The key objectives and policies in relation to the Central Interceptor scheme are identified below.

- To safeguard the integrity, form, functioning and resilience of the coastal environment and sustain its ecosystems by maintaining coastal water quality, and enhancing it where it has deteriorated from what would otherwise be its natural condition, with significant adverse effects on ecology and habitat, because of discharges associated with human activity (Objective 1);
- To preserve the natural character of the coastal environment and protect natural features and landscapes (Objective 2 and Policy 13);
- To enable people and communities to provide for their social, economic, and cultural wellbeing and their health and safety, through subdivision, use, and development, recognising that

functionally some uses and developments can only be located on the coast or in the coastal marine area (Objective 6);

- Recognise that the provision of infrastructure, the supply and transport of energy including the generation and transmission of electricity, and the extraction of minerals are activities important to the social, economic and cultural well-being of people and communities (Policy 6);
- Promote restoration or rehabilitation of the natural character of the coastal environment including by identifying areas and opportunities for restoration or rehabilitation and recognising that where degraded areas of the coastal environment require restoration or rehabilitation, possible approaches include reducing or eliminating discharges of contaminants (Policy 14);
- In managing discharges to water in the coastal environment, have particular regard to the sensitivity of the receiving environment, the nature of contaminants to be discharged and the capacity of the receiving environment to assimilate the contaminants. In managing the discharge of human sewage do not allow the discharge of human sewage directly to the coastal environment without treatment (Policy 23).

The effects of construction of the Central Interceptor main project works are addressed throughout this report and construction will be managed so as to minimise effects on the coastal environment.

Wastewater overflows have contributed over time to the degradation of coastal environments. Future wastewater discharges will be significantly reduced through the implementation of the Central Interceptor main project works and other network improvements made possible by those works. Therefore, direct discharges to the coast will be significantly reduced as a consequence of the proposed network improvements, assisting in safeguarding the integrity, form and functioning of coastal environments, sustaining ecosystems and maintaining coastal water quality. An EPR structure is required at Mangere Pump Station as a safety measure and is necessary so that pressure can be safely released from the tunnel without causing damage to the pump station or tunnel structures or causing uncontrolled overflows from shafts along the tunnel alignment. The likelihood of the EPR structure operating is very low. Works at PS 23 (Frederick Street) will have temporary effects during construction, but the existing pump station building will be removed and in the long term the permanent structures will be designed to minimise adverse effects on the natural character of the coastal environment.

Overall, the proposed works are not contrary to the objectives and policies of the NZCPS.

#### **14.5.2 National Policy Statement on Freshwater Management 2011**

The National Policy Statement on Freshwater Management (NPSFM) 2011 sets out the objectives and policies which direct local government to manage water in an integrated and sustainable manner. Local authorities are required by the RMA to give effect to the NPSFM through plans and policy statements.

Objective A1 refers to the need to safeguard the life-supporting capacity of freshwater environments by sustainably managing the use and development of land and the discharge of contaminants. Policy A4 directs regional councils to amend regional plans to include the following policy on applications for discharges into freshwater environments:

When considering any application for a discharge the consent authority must have regard to the following matters:

*1. a) the extent to which the discharge would avoid contamination that will have an adverse effect on the lifesupporting capacity of fresh water including on any ecosystem associated with fresh water; and*

*b) the extent to which it is feasible and dependable that any more than minor adverse effect on fresh water, and on any ecosystem associated with fresh water, resulting from the discharge would be avoided.*

2. This policy applies to the following discharges (including a diffuse discharge by any person or animal):

a) a new discharge or;

b) a change or increase in any discharge – of any contaminant into fresh water, or onto or into land in circumstances that may result in that contaminant (or, as a result of any natural process from the discharge of that contaminant, any other contaminant) entering fresh water.

The matters have been considered in preparing the NoRs and resource consent applications. A detailed assessment of effects on the environment has been provided in Sections 11.0 and 12.0 of this report and in Part B. Overall, the works will enable improvements to fresh water environments and more than minor adverse effects due to the discharges during construction are not anticipated. Therefore the works are consistent with this policy.

### 14.5.3 Auckland Council Regional Policy Statement

The ARPS became operative on 31 August 1999 and sets in place policies for promoting the sustainable management of resources in the Auckland Region. The ARPS addresses a number of regional issues which are of relevance to this project including (but not limited to): matters of significance to iwi, coastal environment, water quality, and infrastructure.

Features on the ARPS maps relevant to the NoRs and consent applications are identified in Section 9.10. An assessment against the objectives and policies is included in Appendix B and incorporated into the key themes assessments for the regional and district plans in Sections 14.5.4 to 14.5.8.

### 14.5.4 Auckland Council Regional Plan: Coastal

The ARP: C provides the framework to promote the integrated and sustainable management of the Auckland Region's coastal environment. It contains objectives, policies and methods, including rules, which establish the framework within which certain uses within the coastal marine area are permitted and proposals for development can be assessed. The plan was made operative in part in October 2004 with Variation 1 (stormwater and wastewater network discharges) currently awaiting resolution of appeals.

Features on the ARP: C maps relevant to the applications are identified in Section 9.10. Table 14-3 summarises the key themes of the relevant objectives and policies of the plan and provides an assessment against these themes, drawing on the assessment in Appendix B of this report.

**Table 14-3 Auckland Council Regional Plan: Coastal – objectives and policies key themes**

Key theme	Relevant objectives/policies	Comment
Use and development and management of the CMA	ARPS: objective 7.3.3, policy 7.4.10.2  ARP: C: objectives 5.3.3, 9.3.1, 10.3.1, 10.3.2, 11.3.1, 11.3.2, 12.3.1, policies 9.4.1, 10.4.4, 10.4.8, 10.4.13, 10.4.14, 11.4.1, 12.4.1, 12.4.4, 12.4.7, 12.4.9, 12.4.13	<ul style="list-style-type: none"> <li>• The proposed works will provide regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>• The infrastructure has a functional need to locate in the CMA in order to connect the network between the Auckland Isthmus and Mangere.</li> <li>• The tunnel will be located at a significant depth below the seabed in the CPA 1 and will not affect its values.</li> <li>• The proposed works are an appropriate use of the CMA for multiple use/ community benefit.</li> <li>• Construction method and management measures (contained in a CMP) will be undertaken to avoid, remedy, and mitigate adverse effects during construction.</li> </ul>

Key theme	Relevant objectives/policies	Comment
		<ul style="list-style-type: none"> <li>The works are not expected to result in more than minor long term adverse effects on character and amenity of the coastal environment.</li> </ul>
Coastal recreation and public access	APR:C: policies 7.3.1, 7.4.1, 7.4.2, 10.4.1, 10.4.2, 10.4.10, 13.4.4	<ul style="list-style-type: none"> <li>The temporary construction platform at PS 23 (Hillsborough Bay) will affect only a small area and will not interfere with any existing public walkways. Access will still be available along the foreshore at low tides.</li> <li>At the Mangere Pump Station site it will be necessary to restrict public access to the coastal walkway for a short period, but other walkways in the area will remain open.</li> </ul>
Infrastructure	ARPS: objectives 2.6.1, 7.3.4, policies 2.6.14.1, 2.6.14.2, 2.6.14.5, 7.4.19.1 ARP: C: objective 9.3.2, policy 10.4.16 (Var 1)	<ul style="list-style-type: none"> <li>The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the relevant plans.</li> <li>The project will mitigate asset risk by duplicating part of the ageing Western Interceptor.</li> <li>The project will provide regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</li> <li>The proposed works are expected to cause some, mainly temporary, adverse effects due to construction activities but are expected to avoid significant long term adverse effects. Construction methodology and management procedures will aim to avoid, minimise or mitigate adverse effects.</li> <li>The infrastructure has a functional need to locate in the CMA in order to connect the network.</li> </ul>
Discharge of stormwater and wastewater to the CMA	ARP: C objectives 20.3.1, 20.3.2, policies 20.4.3, 20.4.4	<ul style="list-style-type: none"> <li>The EPR structure at Mangere Pump Station is required as a safety measure, but the likelihood of it operating is very low (refer Section 5.11.5).</li> <li>The effects of stormwater runoff from the temporary construction platform at PS 23 will be managed through erosion and sediment control measures. A draft erosion and sediment control plan is contained in Part D Technical Report K.</li> </ul>
Treaty of Waitangi, tangata whenua and cultural heritage	ARPS: objectives 3.3.1, 3.3.3, 7.3.9, policies 3.4.1, 3.4.10, 7.4.7.6 ARP: C: objectives 6.3.1, 6.3.2, policies 6.4.1, 6.4.2, 7.4.3	<ul style="list-style-type: none"> <li>The project will provide important water quality benefits through the reduction in overflows to the environment.</li> <li>Watercare is engaging with iwi to identify any potential effects of the project on tangata whenua or cultural heritage matters.</li> </ul>
Natural character, features and ecosystems	ARPS: objectives 2.6.10, 7.3.1, policies 7.4.4.1, 7.4.10.8, 7.4.10.9	<ul style="list-style-type: none"> <li>The proposed surface works are located in modified environments and not in areas of high natural character.</li> <li>The infrastructure will provide significant environmental</li> </ul>

Key theme	Relevant objectives/policies	Comment
	ARP: C: objectives 3.3.1, 3.3.2, 5.3.1, 5.3.2, policies 3.4.1, 3.4.2, 3.4.3, 3.4.4, 5.4.2, 5.4.5, 5.4.6, 10.4.3, 10.4.5, 10.4.6, 10.4.7, 10.4.9, 12.4.12	<p>benefits through the reduction in overflows to the environment.</p> <ul style="list-style-type: none"> <li>• The tunnel will be well below the seabed in the CPA 1 in Manukau Harbour.</li> <li>• The detailed design of permanent above ground structures will seek to incorporate features into sites as appropriate for the settings e.g. through the use of visually recessive materials. Adverse landscape and visual effects are not expected to be more than minor in the long term.</li> <li>• The effects of the construction platform on coastal processes, apart from the temporary occupation of the seabed, are expected to be less than minor. The impacts of the temporary occupation can be managed with all construction material removed upon completion of the works.</li> </ul>
Landscape and amenity	ARPS: policy 7.4.7.1, 7.4.7.3, ARP: C: objectives 4.3.1, 4.3.2, 10.3.3, policies 4.4.2, 4.4.3, 4.4.4, 4.4.5, 12.4.3	<ul style="list-style-type: none"> <li>• The existing landscape within which the surface works are located is generally a highly modified environment. The landscape is an urban one that has largely been modified through development over time.</li> <li>• Following completion of the works it is proposed to reinstate the work sites and return them to their previous appearance.</li> <li>• The coastal edge around the northern shore of Hillsborough Bay is a Regionally Significant Landscape (Rating 5) in the ARP: C. With appropriate design and treatment of the permanent features (e.g. use of recessive materials, use of basalt or similar to sheath above ground portion of access shafts) it is considered that there would be no permanent adverse effects on the landscape quality, aesthetic value and landscape sensitivity of the Manukau Harbour.</li> </ul>
Disturbance and deposition	ARP: C: objective 16.3.1, policies 16.4.1, 16.4.2, 16.4.7, 16.4.9, 16.4.10, 17.4.2, 17.4.6	<ul style="list-style-type: none"> <li>• The construction of the temporary construction platform will require the deposition of cleanfill material. This material will be removed on the completion of construction and the CMA reinstated.</li> <li>• Works in the CMA will involve some disturbance. The surface works will occur in reasonably confined areas and the construction works areas will be minimised to keep disturbance to a minimum.</li> <li>• Removal of mangroves may be required for the works in the CMA at PS 23 (Frederick Street) and for the construction of the EPR structure at Mangere Pump Station. This will be in a small area and will not involve the removal of significant areas of mangroves.</li> </ul>

The proposed works give effect to, or are generally consistent with, the relevant objectives and policies in the ARP: C.

Table 14-4 assesses the proposed works against the relevant assessment criteria contained in the ARP: C.

**Table 14-4 Auckland Council Regional Plan: Coastal – Assessment Criteria**

Rule	Criteria	Comment
12.5.17 – occupation of the CMA	<p>The ARC will restrict the exercise of its discretion to the matters specified in Rule 10.5.7 a, d, e, f and g.</p> <p>(a) the spatial and temporal extent of the physical occupation; and</p> <p>(d) the effect the proposal may have on existing resource consent holders of occupation or those able to occupy as of right, within the same locality or the vicinity; and</p> <p>(e) navigation and safety; and</p> <p>(f) the cumulative effects of the occupation; and</p> <p>(g) the duration of the occupation consent;</p>	<p>The main tunnel will occupy an area of General Management Area in the CMA. It will be located well below the seabed and its occupation is not expected to have adverse effects.</p>
16.5.17.1 – disturbance of CMA	<p>The ARC will restrict the exercise of its discretion under Rules 16.5.16 and 16.5.17 to the following matters:</p> <p>(a) the quantity and area of the disturbance, including disturbance associated with the removal of Pacific Oyster shells, or vegetation, with reference to likely environmental effects;</p> <p>(b) navigation and safety matters;</p> <p>(c) the effect of the disturbance, or vegetation removal on any cultural heritage site, building, place or area scheduled for preservation or protection in Cultural Heritage Schedules 1 or 2;</p> <p>(d) the effect of the disturbance, or vegetation removal, on the ecological or geological values, physical processes, and natural character;</p> <p>(e) the practicable alternatives to the disturbance or vegetation removal activity, including locating or undertaking the activity outside of the coastal marine area;</p> <p>(f) the effect of the disturbance, or vegetation removal, on public access;</p> <p>(g) the relevant conditions of the permitted activity with which the proposed activity fails to comply;</p> <p>(h) the appropriateness of mangrove removal activities in terms of policy 16.4.7 and 16.4.8;</p> <p>(i) the timing and method of the removal or disturbance, and the disposal of any removed material;</p> <p>(j) the measures proposed to avoid, remedy or mitigate any adverse effects from the disturbance or vegetation removal activity;</p>	<p>The disturbance of the CMA associated with construction of the main tunnel will not involve disturbance at the surface of the seabed. The works at PS 23 and Mangere Pump Station in the CMA involve a modest area of disturbance, as described in Part B.</p> <p>The works are not expected to adversely affect navigation and safety and no cultural heritage sites will be affected.</p> <p>The effects of the works on ecology, coastal processes, and public access have been assessed in Sections 11 and 12 of this report and in Part B Sections 8 and 10. The effects will be of a temporary nature and able to be appropriately mitigated.</p> <p>At PS 23 the CMA will be reinstated upon completion of construction works, with appropriate sediment where necessary.</p>



Rule	Criteria	Comment
	(k) the duration of the resource consent; and (l) monitoring of the resource consent.	

#### 14.5.5 Auckland Council Regional Plan: Sediment Control

The ARP: SC addresses the issue of sediment discharge, and defines the mechanisms Auckland Council has chosen for avoiding, mitigating or remedying adverse effects on the environment due to sediment discharge from bare earth surfaces. The ARP: SC became operative in November 2001. It controls land disturbing activities and contains rules relating to land uses (under s9 of the RMA) and discharge, damming, and diversion (under sections 14 and 15 of the RMA).

Table 14-5 summarises the key themes of the relevant objectives and policies of the plan and provides an assessment against these themes, drawing on the assessment outlined in Appendix B of this report.

**Table 14-5 Auckland Council Regional Plan: Sediment Control – objectives and policies key themes**

Key theme	Relevant objectives/policies	Comment
Land disturbance	ARPS: policy 8.4.7.3 ARP: SC: objectives 5.1.1, 5.1.2, policies 5.2.1, 5.2.2	<ul style="list-style-type: none"> <li>Erosion and Sediment Control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical Report K.</li> </ul>
Treaty of Waitangi, tangata whenua and cultural heritage	ARPS: objectives 3.3.1, 3.3.3, 7.3.9, policies 2.5.2.8, 3.4.1, 3.4.10, 7.4.7.6 ARP: SC: objective 5.1.2	<ul style="list-style-type: none"> <li>The project will provide important water quality benefits through the reduction in overflows to the environment.</li> <li>Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.</li> </ul>

The proposed works give effect to the relevant objectives and policies in the ARP: SC.

Table 14-6 assesses the proposed works against the relevant assessment criteria contained in the ARP: SC.

**Table 14-6 Auckland Council Regional Plan: Sediment Control – Assessment Criteria**

Rule	Criteria	Comment
5.4.3.2	(i) Techniques used to restrict or control sediment being transported from the site and the effects or impacts of sediment on water quality from the techniques chosen, including the practicality and efficiency of the proposed control measures; (ii) The proportion of the catchment which is exposed; (iii) The proximity of the operation to the receiving environment; (iv) The concentration and volume of any sediment	<p>At some sites earthworks will occur within the sediment control protection area. Draft Erosion and Sediment Control Plans have been prepared which will manage effects from the earthworks (refer Technical Report K of Part D).</p> <p>The large majority of the works will be done using tunnelling methods, so the amount of earth exposed as part</p>

Rule	Criteria	Comment
	<p>that may be discharged;</p> <p>(v) The time during which the bare earth surface is exposed;</p> <p>(vi) The time of year when the activity is undertaken;</p> <p>(vii) The duration of the consent;</p> <p>(viii) Monitoring the volume and concentration of any sediment that may be discharged;</p> <p>(ix) Administrative charges under Section 36 of the RM Act;</p> <p>(x) Bonds under Section 108(1)[A](b) of the RM Act;</p> <p>(xi) Provisions for obtaining Environmental Benefits (Financial Contributions – Refer to Section 5.7 of this Plan).</p>	<p>of the overall project is relatively low.</p> <p>It is intended that earthworks will be undertaken throughout the calendar year and the consent for earthworks is sought on this basis.</p>

#### 14.5.6 Auckland Council Regional Plan: Air, Land and Water

The ARP: ALW provides for the management of air, land and water resources in the region including: air, soil, rivers and streams, lakes, groundwater, wetlands and geothermal water. The ARP: ALW was made operative in part on the 21st October 2010. Further parts, including parts of Chapter 5: Discharges to Land and Water, and Land Management provisions relating to issues, objectives and policies in relation to stormwater and wastewater, became operative on 30 April 2012.

Features on the ARP: ALW maps relevant to the NoRs and consent applications are identified in Section 9.10. Table 14-7 summarises the key themes of the relevant objectives and policies of the plan and provides an assessment against these themes, drawing on the assessment outlined in Appendix B of this report.

**Table 14-7 Auckland Council Regional Plan: Air, Land and Water – objectives and policies key themes**

Key theme	Relevant objectives/policies	Comment
Infrastructure	<p>ARPS: objectives 2.6.1, 7.3.4, policies 2.6.14.1, 2.6.14.2, 2.6.14.5, 7.4.19.1</p> <p>ARP: ALW: objectives 2.2.3.4, 2.2.3.5, policies 2.2.4.4, 5.3.7</p>	<ul style="list-style-type: none"> <li>• The proposed works will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the relevant plans.</li> <li>• The proposed works will mitigate asset risk by duplicating part of the ageing Western Interceptor.</li> <li>• The project will provide regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>• The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</li> <li>• The proposed works are expected to cause some, mainly temporary, adverse effects due to construction activities but are expected to avoid significant long term adverse effects. Construction methodology and</li> </ul>

Key theme	Relevant objectives/policies	Comment
		management procedures will aim to avoid, minimise or mitigate adverse effects.
Groundwater take and diversion	ARP: ALW: objectives 6.3.3, 6.3.8, policies 6.4.1, 6.4.2, 6.4.5, 6.4.50,	<ul style="list-style-type: none"> <li>• Construction methodology and management will be undertaken so as to minimise effects of groundwater drawdown due to the tunnel excavation. The effects of the groundwater take and diversion due to tunnel and shaft construction have been considered in Section 11.2.</li> </ul>
Stormwater and construction related discharges	ARPS: policy 8.4.7.1 ARP: ALW: objectives 5.3.1, 5.3.3, 5.3.5, 5.3.8, policies 5.4.2, 5.4.4, 5.4.4A, 5.4.4B, 5.4.4C, 5.4.44,	<ul style="list-style-type: none"> <li>• While the impervious area threshold will be exceeded by permanent works at some sites, the surfaces will be subject to low vehicle traffic and there will be limited sources of contaminants. Appropriate devices meeting TP 10 and TP 90 requirements will be provided.</li> <li>• The proposed works will provide regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>• Where necessary, process water and groundwater from dewatering will be treated prior to discharge at the site water treatment facilities.</li> </ul>
Air quality	ARP: ALW: objectives 4.3.1, 4.3.2, 4.3.4, 4.3.5, 4.3.10, policies 4.4.1, 4.4.3, 4.4.5, 4.4.6, 4.4.7, 4.4.9, 4.4.10, 4.4.15, 4.4.25	<ul style="list-style-type: none"> <li>• The potential effects of the discharge of odour from the operation of the scheme have been assessed, taking into account FIDOL factors. Air treatment facilities are proposed for the scheme at some sites. Overall, both during normal operation and during wet weather events, adverse effects due to discharges of odour from the Central Interceptor are expected to be less than minor. The exception to this is where temporary localised effects of a no more than minor nature are expected at some sites during cleaning of grit traps and where discharge of moderately odorous air occurs at air intakes during moderate to severe weather events.</li> <li>• Additional ATFs are proposed in the event that any air quality issues occur.</li> </ul>
Contaminated land	ARP: ALW: objectives 5.3.15A, 5.3.15, 5.3.16, policies 5.4.36, 5.4.37, 5.4.37A, 5.4.37B,	<ul style="list-style-type: none"> <li>• A draft site management plan has been prepared to address the management of contaminated soils.</li> </ul>
Treaty of Waitangi, tangata whenua and cultural heritage	ARPS: objectives 3.3.1, 3.3.3, 7.3.9, policies 3.4.1, 3.4.10, 7.4.7.6 ARP: ALW: objectives 2.3.3.1, 2.3.3.2, policies 2.3.4.1, 2.3.4.2, 2.3.4.4	<ul style="list-style-type: none"> <li>• The project will provide important water quality benefits through the reduction in overflows to the environment.</li> <li>• Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.</li> </ul>
Use and development of natural and physical resources	ARP: ALW: objectives 2.2.3.1, 2.2.3.2, 2.2.3.3, policies 2.2.4.1, 2.2.4.8, 2.2.4.11, 2.2.4.12	<ul style="list-style-type: none"> <li>• The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the relevant plans.</li> <li>• Construction method and management measures</li> </ul>

Key theme	Relevant objectives/policies	Comment
		(contained in a CMP) will be implemented to avoid, remedy, and mitigate adverse effects during construction.
Natural character, features and ecosystems	ARPS: objectives 2.6.10, 7.3.1, policies 7.4.4.1, 7.4.10.8, 7.4.10.9 ARP: ALW: objectives 2.1.3.2, 2.1.3.4, 7.3.3, policy 2.1.4.1	<ul style="list-style-type: none"> <li>The proposed surface works are located in modified environments and not in areas of high natural character.</li> <li>The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</li> </ul>
Landscape and amenity	ARPS: policy 7.4.7.1, 7.4.7.3, ARP: ALW: objective 2.2.3.7, policy 2.2.4.13	<ul style="list-style-type: none"> <li>The existing landscape within which the surface works are located is generally a highly modified environment. The landscape is an urban one that has largely been modified through development over time.</li> <li>Following completion of the works it is proposed to reinstate the work sites and return them to their previous appearance, or as agreed with the landowner.</li> </ul>

The proposed works give effect to, or are generally consistent with, the relevant objectives and policies in the ARP: ALW.

Table 14-8 assesses the proposed works against the relevant assessment criteria contained in the ARP: ALW.

**Table 14-8 Auckland Council Regional Plan: Air, Land and Water – Assessment Criteria**

Rule	Criteria	Comment
5.5.2A - stormwater	<p>The ARC shall exercise its control over the following matters in rule 5.5.2:</p> <p>(a) The provision of methods to avoid downstream channel erosion;</p> <p>(b) The methods to achieve Rule 5.5.2 (c), (d) and (e) and erosion control, including the extent and type of vegetation and/or re-vegetation cover on site;</p> <p>(c) The location of the point of discharge;</p> <p>(d) The degree of consistency and integration with any Integrated Catchment Management Plan or stormwater network consent within the same catchment;</p> <p>(e) Effects on archaeological sites, waahi tapu, and the matters listed in Policy 2.3.4.4.</p> <p>(f) Monitoring and reporting requirements; and</p> <p>(g) The duration of the consent.</p>	<p>Stormwater management and erosion and sediment control measures, including draft plans showing proposed methods and discharge locations, are contained in Part D Technical Report K.</p> <p>No known archaeological sites will be affected and accidental discovery protocols will be developed to address the possibility of uncovering previously undiscovered sites.</p>
5.5.3A - stormwater	<p>The ARC shall restrict the exercise of its discretion to the matters within the conditions and standards and terms of Rules 5.5.1, 5.5.2 and 5.5.9 that the activity is unable to comply with together with the following matters:</p> <p>(a) The provision of methods to avoid downstream</p>	<p>Stormwater management and erosion and sediment control measures, including draft plans showing proposed methods and discharge locations, are contained in Part D Technical Report K. These measures</p>

Rule	Criteria	Comment
	<p>channel erosion;</p> <p>(b) The methods to achieve standards and terms (c) and (d) of Rule 5.5.2, including the extent and type of vegetation and/or re-vegetation cover on site;</p> <p>(c) The location of the point of discharge;</p> <p>(d) The effects of the discharge of contaminants after reasonable mixing in the relevant receiving environment;</p>	<p>will help to minimise the discharge of contaminants to the receiving environments.</p>
5.5.44A	<p>The ARC shall restrict the exercise of its discretion to the following matters under Rule 5.5.44A:</p> <p>(a) The particular matter of non-compliance with the standards and terms of Rule 5.5.43 or Rule 5.5.44;</p> <p>(b) Methods to avoid adverse effects on potable water supplies;</p> <p>(c) Methods to control vapour migration;</p> <p>(d) The preparation, adequacy and implementation of an (Intrusive) Site Investigation Report (SIR), an environmental and human health risk assessment, a Remedial Action Plan (RAP), a Monitoring and Management Plan (MMP), and a Site Validation Report (SVR) for the land prepared in accordance with the requirements of Rules 5.5.43 and 5.5.44;</p> <p>(e) The duration of the consent; and</p> <p>(f) The timing and nature of reviews of consent conditions.</p>	<p>A desk top study has been undertaken for the construction sites to assess the potential for contamination. At this stage intrusive site investigations have only been undertaken at some sites (those that may contain landfill). Therefore the requirements of Rule 5.5.44 (a) have not been met. Watercare is seeking a project wide resource consent for the disturbance of land containing elevated levels of contaminants.</p> <p>A draft site management plan/remedial action plan has been prepared and is contained in Part D Technical Report I.</p>
5.5.63 – discharge of wastewater and/or washwater into water or onto land where it will enter water (construction site related discharges)	<p>(a) the volume and level of contamination;</p> <p>(b) the method of discharge and effects arising from the method chosen;</p> <p>(c) the provision and adequacy of equipment for the collection, treatment and disposal of any discharge; and</p> <p>(d) the requirements for and specifications of consent monitoring.</p>	<p>The discharges are of a minor nature and may for example contain elevated suspended sediment levels and/or pH and will be treated prior to discharge if necessary, for example by settlement/flocculation and/or pH treatment.</p>
6.5.77 – diversion of groundwater	<p>(a) The effects on the flow regime required for the life-supporting capacity of waterbodies including:</p> <p>(i) stream flow requirements;</p> <p>(ii) levels and flows in wetlands; and</p> <p>(iii) lake levels.</p> <p>(b) Any adverse effects on existing lawful groundwater users, including</p>	<p>Effects of the diversion of groundwater on the groundwater regime and on surface settlement are addressed in Section 11.2. The proposed works are not expected to adversely affect waterbodies, heritage values, or groundwater users or result in significant damage to structures, buildings or services.</p>

Rule	Criteria	Comment
	(i) lawful groundwater diversion; (ii) lawful groundwater takes. (c) Any adverse effects on building owners and arising from the potential for ground settlement that may result in significant damage to structures, buildings, and services; (d) The potential for adverse effects arising from surface flooding; (e) Cumulative effects that may arise from the scale, location and/or number of groundwater diversions in the same area; (f) Discharge of groundwater containing sediment and other contaminants; (g) Any adverse effects on the heritage values of sites, including archaeological significance; (h) Any adverse effects on ecosystem habitat, both terrestrial and freshwater; (i) The duration of the consent; (j) The monitoring and reporting requirements; (k) The timing and nature of reviews of consent conditions; (l) The requirement for and conditions of a financial contribution and/or bond; and (m) The requirement for a monitoring and contingency plan/contingency and remedial action plan.	Where required, groundwater containing sediment/other contaminants will be treated prior to discharge.

#### 14.5.7 Auckland Council District Plan (Auckland City Isthmus Section)

The Auckland Council District Plan (Auckland City Isthmus Section) became operative in November 1999. It sets out the resource management objectives, policies and rules to manage the natural and physical environment in the Auckland isthmus area previously contained within the Auckland City boundary.

Features on the Auckland City District Plan maps relevant to the NoRs and consent applications are identified in Section 9.10. Table 14-9 summarises the key themes of the relevant objectives and policies of the plan and provides an assessment against these themes, drawing on the assessment outlined in Appendix B of this report.

**Table 14-9 Auckland Council District Plan (Auckland City Isthmus Section) – objectives and policies – key themes**

Key theme	Relevant objectives/policies	Comment
Land disturbance	ARPS: policy 8.4.7.3	<ul style="list-style-type: none"> <li>Erosion and Sediment Control measures will be implemented for the duration of the proposed works to</li> </ul>

Key theme	Relevant objectives/policies	Comment
	Auckland City District Plan: 5B.4.3	prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical Report K.
Infrastructure	ARPS: objectives 2.6.1, 7.3.4, policies 2.6.14.1, 2.6.14.2, 2.6.14.5, 7.4.19.1  Auckland City District Plan: objective 4A.4.2, policy 4A.4.3	<ul style="list-style-type: none"> <li>• The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the relevant plans.</li> <li>• The project will mitigate asset risk by duplicating part of the ageing Western Interceptor.</li> <li>• The project will provide regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>• The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</li> </ul>
Natural character, features and ecosystems	ARPS: objectives 2.6.10, 7.3.1, policies 7.4.4.1, 7.4.10.8, 7.4.10.9  Auckland City District Plan: objectives 2.3.1, 5B.4.1, 5B.4.2, 5B.4.3, 5B.4.6, policies 5B.4.1, 5B.4.2, 5B.4.3, 5B.4.6	<ul style="list-style-type: none"> <li>• The proposed surface works are located in modified environments and not in areas of high natural character. The detailed design of permanent above ground structures will seek to incorporate features into sites as appropriate for the settings e.g. through the use of visually recessive materials. Adverse landscape and visual effects are not expected to be more than minor in the long term.</li> <li>• Measures will be put in place to mitigate adverse ecological effects and overall the effects will be minor or able to be sufficiently mitigated.</li> <li>• The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</li> <li>• Outside of the construction sites the earthworks will be below the surface and therefore will not affect natural character or ecosystems. At the construction sites Erosion and Sediment Control measures will be implemented to manage effects.</li> </ul>
Heritage	ARPS: policy 6.4.19.4  Auckland City District Plan: objective 2.3.2	<ul style="list-style-type: none"> <li>• There will be temporary effects on residential amenity at some sites neighbouring the construction sites. Measures will be implemented to avoid, remedy, or mitigate these construction effects, such as the use of site fencing, noise barriers, communication with residents etc (refer Part B for specific measures).</li> <li>• No known archaeological sites will be affected by the works.</li> <li>• The sites at Haverstock Road and Walmsley Park are within the view shaft for Mt Albert. However, the permanent structures at these sites will only comprise of covers, at ground level.</li> </ul>
Community	Auckland City District Plan: objective 2.3.3	<ul style="list-style-type: none"> <li>• The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth</li> </ul>



Key theme	Relevant objectives/policies	Comment
		<p>containment policies of the relevant plans.</p> <ul style="list-style-type: none"> <li>• The project will provide important regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>• Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.</li> </ul>

The proposed works give effect to, or are generally consistent with, the relevant objectives and policies in the Auckland City District Plan.

Table 14-10 assesses the proposed works against the relevant assessment criteria contained in the Auckland City District Plan.

**Table 14-10 Auckland Council District Plan (Auckland City Isthmus Section) – Assessment Criteria**

Rule	Criteria	Comment
4A.2B - Earthworks	<p>The nature and extent of the proposed work and the degree to which it will disturb natural landforms or vegetation or create soil instability, or lead to adverse ecological effects to natural habitats, watercourses, wetlands, estuaries and coastal waters.</p> <p>The extent to which the movement of soil or materials to or from the site may affect the surrounding roads.</p> <p>The extent to which water containing silt or sediment or contaminants may enter storm water pipes, drains, channels or soakage systems.</p> <p>The extent to which surface stabilisation will be achieved as progressive earthworks are undertaken and completed and the means by which surface stabilisation will be achieved.</p>	<p>As the tunnelling earthworks do not involve surface disturbance these considerations are not relevant.</p> <p>At the construction sites Erosion and Sediment Control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical Report K.</p>
5B.7.3 – Coastal Earthworks	<p>The Plan's objectives and policies, particularly those in respect of the coast;</p> <p>Any alternative methods which may be available to the applicant in the achievement of his/her objectives;</p> <p>The extent to which the existing landscape contributes to the visual amenity of the locality;</p> <p>The nature and extent of the proposed work and the degree to which it may disturb natural landforms or vegetation or create soil instability, or lead to adverse ecological effects to natural habitats, watercourses, wetlands, estuaries and coastal waters.</p>	<p>The tunnel corridor extends into the coastal management area near the PS 23 (Frederick Street) site. As the tunnelling earthworks do not involve surface disturbance these considerations are not relevant.</p> <p>The applicant has limited alternatives available to them to achieve the objectives of the project. The tunnel needs to connect to the Mangere WWTP and this necessitates crossing beneath the Manukau Harbour. The existing Watercare PS 23 (Frederick Street) site that will be used is located</p>

Rule	Criteria	Comment
		<p>in the coastal management area.</p> <p>Erosion and Sediment Control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses or coastal waters. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical Report K.</p>
<p>9.7.1.3.2 – Earthworks in Open Space 1-4</p>	<p>In considering any application for a controlled activity, the proposal will be considered against the following criteria:</p> <ul style="list-style-type: none"> <li>• The Plan's objectives and policies, for the relevant zone;</li> <li>• The applicant's need to undertake the earthworks in order to allow for proper functioning of the dominant activity of the site;</li> <li>• Any alternative methods which may be available to the applicant in the achievement of his/her objectives;</li> <li>• All previous applications made in respect of the land which involves consideration of landscape conservation;</li> <li>• The extent to which the existing landscape contributes to the visual amenity of the locality;</li> <li>• The nature and extent of the proposed work and the degree to which it may disturb natural landforms or vegetation or create soil instability, or lead to adverse ecological effects to natural habitats, watercourses, wetlands, estuaries and coastal waters;</li> <li>• The extent to which the movement of soil or material to or from the site may affect the surrounding road and neighbourhood, particularly where access to the site is gained through residential areas;</li> <li>• The extent to which water containing silt or sediment or contaminants may enter stormwater pipes, drains, channels, or soakage systems, or flow on to the road, from bare ground on the site during rainstorms;</li> <li>• Where earthworks are in proximity to property boundaries particular attention will be given to <ul style="list-style-type: none"> <li>- standards of compaction of earth fill</li> <li>- sediment control</li> </ul> </li> </ul>	<p>As the tunnelling earthworks do not involve surface disturbance these considerations are not relevant.</p> <p>At the construction sites Erosion and Sediment Control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical K.</p>

Rule	Criteria	Comment
	<ul style="list-style-type: none"> <li>- stability of surrounding land</li> <li>- revegetation of land once earthworks are completed.</li> </ul>	
7.7.4.3B - Earthworks in residential zones	When assessing an application for resource consent for any earthworks, the Council must be satisfied that the potential effect(s) have been considered and that the relevant objectives and policies of the zone have been met and that, for land situated in Residential 3a and 3b zones, earthworks will not detract from the natural character of the cone, cliff or landscape on which they are situated.	The works involve tunnelling under residential zones. The effects have been assessed in Sections 10.0 to 12.0. The tunnelling earthworks do not involve surface disturbance and will not have an adverse effect on the residential zones.
5D.6.1 – Land subject to instability	<p>In exercising its discretion to grant a consent, the Council will consider the effects of the activity, development or subdivision, in the avoidance or mitigation of the natural hazards identified, together with any adverse effects generally on the environment.</p> <p>Any application will be required to be accompanied by an engineering assessment, and investigative evidence of the site which indicates that the site can be safely developed. The assessment shall also indicate any measures to be taken to mitigate any adverse effects of the natural hazards.</p>	<p>Any proposed works will be undertaken following best practice engineering.</p> <p>At the detailed design stage any specific engineering requirements will be worked out and implemented.</p>

#### 14.5.8 Auckland Council District Plan (Manukau Section)

The Manukau District Plan became operative in 2002. It sets out the resource management objectives, policies and rules to manage the natural and physical environment in the area previously contained within the Manukau City boundary.

Features on the Manukau District Plan maps relevant to the NoRs and consent applications are identified in Section 9.10. Table 14-11 summarises the key themes of the relevant objectives and policies of the plan and provides an assessment against these themes, drawing on the assessment outlined in Appendix B of this report.

**Table 14-11 Auckland Council District Plan (Manukau Section) – objectives and policies – key themes**

Key theme	Relevant objectives/policies	Comment
Land disturbance	ARPS: policy 8.4.7.3 MDP: objectives 9.3.1, 9.3.4	<ul style="list-style-type: none"> <li>• Erosion and Sediment Control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical Report K.</li> </ul>
Infrastructure	ARPS: objectives 2.6.1, 7.3.4, policies 2.6.14.1, 2.6.14.2, 2.6.14.5, 7.4.19.1	<ul style="list-style-type: none"> <li>• The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth</li> </ul>

Key theme	Relevant objectives/policies	Comment
	MDP: objectives 7.3.1, 7.3.2, 7.3.3, policies 7.4.1, 7.4.2, 7.4.3	<p>containment policies of the relevant plans.</p> <ul style="list-style-type: none"> <li>• The project will mitigate asset risk by duplicating part of the ageing Western Interceptor.</li> <li>• The project will provide regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</li> <li>• The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</li> <li>• The proposed works are expected to cause some, mainly temporary, adverse effects due to construction activities but are expected to avoid significant long term adverse effects. Construction methodology and management procedures will aim to avoid, minimise or mitigate adverse effects.</li> </ul>
Heritage	ARPS: objective 6.3.7, policies 6.4.1.2, 6.4.1.3, 6.4.19.1, 6.4.19.2 MDP: Objective 6.3.1, Policy 6.4.2	<ul style="list-style-type: none"> <li>• The removal of the existing pump station in Kiwi Esplanade reserve will involve works in the dripline of and removal of protected trees. The overall effects of this work will be positive and effects of tree removal can be mitigated by replanting if necessary.</li> <li>• The Link Sewer 4 trenching in the dripline of trees will be managed through the implementation of tree protection measures.</li> <li>• The main tunnel will pass beneath the Mangere Lagoon and the Manukau foreshore lava flows. The tunnel will pass beneath the basalt and will not adversely affect geological heritage features.</li> </ul>
Public open space	Objectives 15.3.1, 15.3.4, 15.3.6	<ul style="list-style-type: none"> <li>• The removal of the existing pump station structure in Kiwi Esplanade reserve will have positive effects on the use and enjoyment and amenity values of this public open space. Adverse effects during demolition will be of a temporary nature only.</li> <li>• The trenching of Link Sewer 4 through the reserve will result in temporary adverse effects of a short term nature and long term there will be no noticeable effects on the public open space.</li> </ul>

The proposed works give effect to, or are generally consistent with, the relevant objectives and policies in the Manukau District Plan.

Table 14-12 assesses the proposed works against the relevant assessment criteria contained in the Manukau District Plan.

**Table 14-12 Auckland Council District Plan (Manukau Section) – Assessment Criteria**

Rule	Criteria	Comment
6.12.1	For all discretionary activity resource consent applications relating to scheduled heritage resources, Council will have regard to the following assessment	The removal of the existing pump station in Kiwi Esplanade reserve will involve works in the dripline of and

Rule	Criteria	Comment
	<p>criteria and relevant matters set out in Section 104 of the Act:</p> <p>(a) whether the proposal has adverse effects on the heritage resource and the measures taken to avoid, remedy or mitigate potential adverse effects;</p> <p>(b) whether the proposed activity detracts from the heritage value of the resource;</p> <p>(c) whether the works or activity would wholly or partially nullify the effect of scheduling the heritage resource;</p> <p>(d) whether there is any change in circumstance that has resulted in a reduction of the value of the heritage resource since the resource was identified in the Plan;</p> <p>(e) whether there is sufficient time and expertise to record and document the heritage resource before the proposal occurs;</p> <p>(f) whether consultation has occurred with heritage organisations such as New Zealand Historic Places Trust and the Department of Conservation and any other Heritage Protection Authority or Community Group as appropriate;</p> <p>(g) whether the proposal is subject to the requirements of legislation other than the Resource Management Act, for instance the provisions of the Historic Places Act in relation to archaeological sites;</p> <p>(h) whether consultation has occurred with tangata whenua.</p>	<p>removal of generally protected trees (Schedule 6C). The work will result in overall positive effects on the amenity of the area through the removal of the pump station and effects of tree removal can be mitigated by replanting if necessary.</p> <p>The Link Sewer 4 trenching in the dripline of trees will be managed through the implementation of tree protection measures.</p>
<p>6.12.2.4 – Removal of any scheduled tree</p>	<p>(a) The necessity for carrying out the works, including whether the tree is:</p> <ul style="list-style-type: none"> <li>• dead, dying, diseased or has lost the qualities for which it was originally scheduled;</li> <li>• damaged beyond recovery;</li> <li>• required to be removed from drainage systems, water courses or streams;</li> <li>• interfering with public utilities or other public works;</li> <li>• causing serious damage to buildings or property;</li> <li>• causing significant or unusual hardship.</li> </ul> <p>(b) Whether the tree is significant in terms of species, age, size, condition and the genetic stock of the tree;</p> <p>(c) Whether the work is required for compliance with any statutory or legal obligation under other legislation;</p>	<p>The removal of the existing pump station in Kiwi Esplanade reserve will involve works in the dripline of and removal of generally protected trees (Schedule 6C). The work is necessary to remove the existing pump station which will result in overall positive effects on the amenity of the area. Effects of tree removal can be mitigated by replanting if necessary.</p>

Rule	Criteria	Comment
	(d) Whether the tree can be relocated; (e) Whether the proposal can be altered to preserve the tree while still meeting the objectives of the applicant;	

## 14.6 Other relevant documents

### 14.6.1 Auckland Plan

As outlined in Section 3.6.2 the Auckland Plan provides a guide for the region's growth and development over the next 30 years. The Plan identifies that Auckland faces significant wastewater management challenges, including that a notable portion of the wastewater network is exposed to stormwater inflow, which during wet weather exceeds the capacity of the system. The Central Interceptor is identified as a future component of the critical infrastructure network (Map 12.2) to rectify this issue and provide for a sustainable and long term wastewater management system for the Auckland Region. The Auckland Plan contains the following directives:

12.1: Identify, protect and provide existing and future network utility infrastructure to ensure efficient provision of secure and resilient water supply, wastewater, stormwater, energy and telecommunication services that will meet the needs of Auckland over time.

12.2: Integrate planning of network utility infrastructure to provide for population growth.

12.3: Sequence investment across the network utilities and collaborate to identify areas where infrastructure can be effectively provided and where land and corridors can accommodate network utilities services.

12.4: Ensure sustainable design and use of water resources.

The proposed works are consistent with these directives.

### 14.6.2 Local Board Plans

Local Board Plans have been produced by each local board to set out the aspirations and priorities of each community and guide the local board decision making. The following local board plans are relevant to the project:

- Waitemata Local Board Plan 2011;
- Whau Local Board Plan 2011;
- Albert Eden Local Board Plan 2011;
- Puketapapa Local Board Plan 2011; and
- Mangere Otahuhu Local Board Plan 2011.

Items of note from the local board plans that are potentially relevant to the Central Interceptor Project are plans/aspirations for:

- Implementing Keith Hay Park Concept Plan (Puketapapa);
- Implementing Walmsley Park/Underwood Park Concept Plan (Puketapapa);
- Upgrading/developing Kiwi Esplanade Reserve (Mangere-Otahuhu).

The local boards have been consulted on the Central Interceptor Project (refer Section 8.0) and comments received have been taken into account through the design process to the extent possible. The works support the aspirations in the Local Board Plans to see improved quality of waterways.

### **14.6.3 Reserve Management Plans**

Reserve Management Plans relevant to the project are:

- Keith Hay Park Management Plan – April 1989 (Keith Hay Park);
- Underwood Park and Walmsley Park Management Plan – 1989 (Walmsley Park);
- Coastal & Riparian Reserves Management Plan – December 2009 (Kivi Esplanade);

The plans set out objectives and policies for the management of the reserves.

Auckland Council is currently going through a process of updating the concept plan for the development of Keith Hay Park. This has involved public consultation on matters including travel management, incorporation of new land acquisitions into the park, the Three Kings United Football Clubrooms, and the location of some of the community facilities.

The proposed Central Interceptor works will involve temporary use and disruption of confined areas of the reserves. The permanent works that will remain at these reserves will be able to be integrated into the sites such that any long term adverse visual or recreational effects are expected to be no more than minor and will not impede the continued use of the sites as reserves. The management plan relating to Kivi Esplanade notes the importance of the birds in this area and the need to keep the area open. The proposed works are consistent with this as they are located in an area with existing structures and trees.



## 15.0 Conclusions

The Central Interceptor main project works will form an integral part of Auckland's wastewater network and has significant positive effects by:

- Providing additional sewer network capacity for growth and development;
- Providing asset security by duplicating the lower section of the ageing Western Interceptor;
- Significantly reducing the major wastewater overflows into the Meola Creek catchment; and
- Providing the opportunity to further reduce existing wastewater overflows from the combined sewer system into urban streams and the Waitemata Harbour.

During construction, there will be a range of effects within the immediate vicinity of the works areas, but any adverse effects will generally be of a temporary and no more than minor nature and/or can be mitigated with appropriate construction management or in the longer term. Once completed, the Central Interceptor and associated features will be predominantly underground, and temporary work areas will be reinstated in an appropriate manner. In many cases the only visible permanent features at the construction sites will be shaft covers and manholes. Some more visible above ground permanent works will remain at some sites. These will be designed to have no more than minor adverse effects.

The Central Interceptor main project works are consistent with the purpose of the RMA in that they allow for the management of natural and physical resources in a way that enables people and communities to provide for their social, economic and cultural well being and for their health and safety. The main project works give effect to, or are generally consistent with, the objectives and policies of the relevant statutory plans.

## References

Raudkivi, A.J. 1975. *Assessment of hydrographic and hydrological effects of the Mt Roskill-Wiri Motorway. Stage 1, on Onehunga Bay.* University of Auckland, School of Engineering, Letter report to Ministry of Works dated 24 March 1975.

Tonkin & Taylor Ltd (T&T), 1986. Manukau Harbour Resources

Watercare Services Ltd (Watercare), 2008. *Three Waters Final 2008 Strategic Plan.* Auckland: Watercare Services Ltd.



## Appendix A – Application Forms



# Application for Resource Consent Form A

Resource Consents Department  
Under Section 88 of the Resource Management Act 1991  
Please send or deliver your application to the Council



**Office Use Only:**

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

**It is important to complete both FORM A and other relevant FORM B(s) and provide all necessary information as required in order for your application to be accepted.**

Accept /Reject	1.0 GENERAL DETAILS
	<p><b>This application is for:</b></p> <p> <input checked="" type="checkbox"/> Landuse Consent (District/City)                <input type="checkbox"/> Subdivision Consent                <input type="checkbox"/> Combined Landuse/Subdivision  <input checked="" type="checkbox"/> Discharge Permit                <input checked="" type="checkbox"/> Coastal Permit                <input checked="" type="checkbox"/> Water Permit  <input checked="" type="checkbox"/> Landuse Consent (Regional)                <input type="checkbox"/> Other (give details) <input style="width: 200px; height: 20px;" type="text"/> </p> <p>Site(s) to which this application relates is described as:</p> <p>No: <input style="width: 80px;" type="text"/> Street: <input style="width: 250px;" type="text" value="multiple sites"/> Suburb: <input style="width: 100px;" type="text"/></p> <p>Legal Description: <input style="width: 600px;" type="text" value="Refer Section 1.2.2 AEE Part A"/></p>
	2.0 APPLICANT DETAILS
	<p>Name: <i>(please write all names in full)</i> <input style="width: 600px;" type="text" value="Watercare Services Ltd"/></p> <p>Name of company contact/trustee names: <input style="width: 600px;" type="text" value="Belinda Petersen"/></p> <p>Physical Address: <input style="width: 500px;" type="text" value="2 Nuffield Street, Newmarket"/> Postcode: <input style="width: 80px;" type="text" value="1023"/></p> <p>Postal Address: <i>(if different)</i> <input style="width: 500px;" type="text" value="Private Bag 92 521, Wellesley Street"/> Postcode: <input style="width: 80px;" type="text" value="1141"/></p> <p>Phone (day): <input style="width: 100px;" type="text" value="09 539 7477"/> Mobile: <input style="width: 100px;" type="text" value="021 597 477"/> Fax: <input style="width: 100px;" type="text"/></p> <p>Email: <input style="width: 600px;" type="text" value="BPetersen@water.co.nz"/> <input type="checkbox"/> Please tick if email preferred method</p> <p>The applicant is the:</p> <p> <input type="checkbox"/> Owner              <input type="checkbox"/> Occupier              <input type="checkbox"/> Lessee              <input type="checkbox"/> Prospective Purchaser              <input type="checkbox"/> The Crown  <input checked="" type="checkbox"/> Network Utility Operator              <input type="checkbox"/> Other         </p> <p>of the site to which the application relates.</p> <p>P096.4 08/07/10</p>

## 3.0 AGENT/CONSULTANT DETAILS (If different from above)

Company:	<input type="text" value="as above"/>	Contact Person:	<input type="text"/>
Postal Address of Agent:	<input type="text"/>		Postcode: <input type="text"/>
Phone (day):	<input type="text"/>	Mobile:	<input type="text"/>
		Fax:	<input type="text"/>
Email:	<input type="text"/>		
	<input type="checkbox"/> Please tick if email preferred method		

## 4.0 ADDRESS FOR CORRESPONDENCE AND INVOICES

All correspondence (excluding invoices) sent to:

Address:	<input type="text" value="Watercare Services Ltd (as above)"/>	Postcode: <input type="text"/>
<input checked="" type="checkbox"/> Applicant	<input type="checkbox"/> Agent/Consultant	<input type="checkbox"/> Other (give details) <input type="text"/>

Invoices sent to:

Address:	<input type="text" value="Watercare Services Ltd (as above)"/>	Postcode: <input type="text"/>
<input checked="" type="checkbox"/> Applicant	<input type="checkbox"/> Agent/Consultant	<input type="checkbox"/> Other (give details) <input type="text"/>

## 5.0 DISTRICT AND REGIONAL PLANS

**Relevant District Plan:**

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Auckland Central | <input type="checkbox"/> Auckland Gulf Islands | <input checked="" type="checkbox"/> Auckland Isthmus |
| <input type="checkbox"/> Franklin         | <input checked="" type="checkbox"/> Manukau    | <input type="checkbox"/> North Shore                 |
| <input type="checkbox"/> Papakura         | <input type="checkbox"/> Rodney                | <input type="checkbox"/> Waitakere                   |

**Relevant Regional Plan:**

- |  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> Coastal    | <input checked="" type="checkbox"/> Sediment Control | <input checked="" type="checkbox"/> Proposed Air, Land, Water |
| <input type="checkbox"/> Farm Dairy Discharges | <input type="checkbox"/> Transitional Regional Plan  |   |

## 6.0 DESCRIPTION OF PROPOSED ACTIVITY (If insufficient space please provide on additional pages)

Construction, operation and maintenance of a wastewater interceptor and other associated tunnels, pipes, structures and activities.

This is called the "Central Interceptor".

## 7.0 ADDITIONAL RESOURCE CONSENTS REQUIRED

Are any resource consent(s) required for this proposal but not being applied for under this application?

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> Landuse Consent (District/City) | <input type="checkbox"/> Subdivision Consent | <input type="checkbox"/> Discharge Permit           |
| <input type="checkbox"/> Coastal Permit                  | <input type="checkbox"/> Water Permit        | <input type="checkbox"/> Landuse Consent (Regional) |

 Other (give details) 

Please advise of any previous consents related to this current application:



Accept/  
Reject

**8.0 PRE APPLICATION INFORMATION**

Have you received pre-application information or had a pre-application meeting regarding this proposal from the Council?

Yes

No

Copy of meeting minutes attached

Date of meeting: various

If **YES**, provide the reference number and/or name of staff member(s):

[Empty text box]

**9.0 SITE VISIT REQUIREMENTS**

9.1  As landowner and with the consent of any occupiers or lessees, I agree to council staff or authorised consultants visiting the site, which is the subject of this application, for the purpose of assessing this application.

OR

9.2  If applicant is not the landowner:

Landowner's full name:

[Empty text box]

Landowner's signature:

[Empty text box]

Date Signed:

[Empty text box]

Person authorised to sign on behalf of Landowner:

[Empty text box]

Authorising person's signature:

[Empty text box]

Date Signed:

[Empty text box]

9.3 Is there a locked gate or security system restricting access by council staff?

Yes

No

9.4 Do you have a dog on the property?

Yes

No

9.5 Provide details of any entry restrictions that council staff should be aware of; e.g. health and safety, organic farm etc.

A number of sites are in public reserves. Access to non publicly accessible sites will need to be arranged through Watercare.

**10.0 NOTIFICATION OF THE APPLICATION**

Are you requesting the application to be publicly notified?

Yes

No

Are you requesting the application to be notified to any persons who you consider are likely to be adversely affected by your proposal "if the activity's adverse effects on the person are minor or more than minor (but not less than minor)" and who have not provided their written approval.

Yes

No

*(Please note it is at the discretion of council if an application should be limited notified.)*

If yes to either of the above, please provide an executive summary of your application for notification purposes.

**11.0 INFORMATION TO BE SUBMITTED WITH THE APPLICATION**

To satisfy the requirements of section 88(2) of the Resource Management Act 1991 (RMA), please attach the following information. If inadequate information is supplied with your application, this will cause delays in processing or may result in the application being returned pursuant to section 88(3) of the RMA. **Four (4)** copies (including one unbound) of the following information is required, **or as specified in the relevant form B.**

**A completed signed application form (Form A) including authorisation for site inspection and signed and dated by persons responsible for payment of fees and charges.**

**Any information required to be included in this application by the district plan, the regional plan, the RMA or any regulations made under that Act.**

**Certificates of Title less than 3 months old for the subject site.** Attach the title and any relevant consent notices, covenants, easements attached to the title if relevant or impacted by the proposed activity.

**Locality Plan or Aerial Photo at 1:500 Scale.** Indicate the location of the site in relation to the street and other landmarks. Show the street number of the subject site and those of adjoining sites (rural sites can be shown at 1:1000 if required).

**11.0 INFORMATION TO BE SUBMITTED WITH THE APPLICATION contd**

- Details(s) of the resource consent(s) being applied for including reference to specific Rule(s) / Infringements(s).** See Section 2.3 of AEE Part A
  - In accordance with Schedule 4 of the RMA, an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that the proposed activity may have on the environment.**  
 Include a full description of the proposed activity, the effects that may be generated and how these would be managed. Any consultation undertaken needs to be identified if any, and any response to any person consulted shall be identified. This may require specialist(s) report to be provided. *For more information refer to the Fourth Schedule of the RMA.*
  - Details of other resource consents required but not being applied for at this time (as referred to in Additional Resource Consents section).** NA
  - Information as required by the relevant Form B (indicate below which form(s) is/are being attached).**
- District Plan**
- |   |   |   |
|---|---|---|
| <input type="checkbox"/> B1 Auckland Central Area | <input type="checkbox"/> B2 Auckland Gulf Islands | <input checked="" type="checkbox"/> B3 Auckland Isthmus |
| <input type="checkbox"/> B4 Franklin              | <input checked="" type="checkbox"/> B5 Manukau    | <input type="checkbox"/> B6 North Shore                 |
| <input type="checkbox"/> B7 Papakura              | <input type="checkbox"/> B8 Rodney                | <input type="checkbox"/> B9 Waitakere                   |
- Regional Plan**
- |  |  |
|--|--|
| <input type="checkbox"/> B10 To make, alter or install a bore  | <input checked="" type="checkbox"/> B11 To take, use or divert groundwater                                   |
| <input type="checkbox"/> B12 To take or use surface water  | <input type="checkbox"/> B13 To dam surface water  |
| <input type="checkbox"/> B14 To divert surface water   | <input checked="" type="checkbox"/> B15 Land disturbing activities – sediment control                        |
| <input checked="" type="checkbox"/> B16 Diversion and discharge of stormwater  | <input type="checkbox"/> B17 Activities in, on, under or over the beds of lakes, rivers and streams          |
| <input type="checkbox"/> B18 To discharge less than or equal to 6m <sup>3</sup> / day of domestic wastewater onto or into Land | <input checked="" type="checkbox"/> B19 To discharge contaminants into or onto land or to water              |
| <input checked="" type="checkbox"/> B20 To discharge contaminants into air   | <input type="checkbox"/> B21 To discharge contaminants onto or into land from an industrial or trade process |
| <input checked="" type="checkbox"/> B22 Remediation, disturbance management and discharge from contaminated land               | <input checked="" type="checkbox"/> B23 Coastal activities   |

**12.0 CONTRIBUTIONS**

When granting consent to certain activities, the Council may levy a monetary contribution. Development contributions are levied under the Local Government Act 2002 in accordance with the Council's Development Contribution Policy. Financial or reserve contributions are levied under the RMA under the relevant District Plan. Any such contributions can be challenged. However, when such contributions become due, the consent holder is responsible for their payment.

Name and address of person responsible for payment of any contributions:

**Name: (please write all names in full)**

Postal Address:

Phone (home):  (business)  (mobile)

Email:  Fax

Signature:  Date:

**13.0 DEPOSIT**

The required deposit must be paid before any processing of the application will start.

- I enclose a deposit fee of \$  for the processing of this application. I/we understand that Council may invoice me for the actual and reasonable costs incurred in the processing of this application. \*

Accept/  
Reject

## 14.0 DECLARATION CONCERNING PAYMENT OF FEES

I/we understand that the Council may charge me/us for all costs actually and reasonably incurred in processing this application. Subject to my/our rights under sections 357B and 358 of the RMA to object to any costs, I/we undertake to pay all and future processing costs incurred by the Council. Without limiting the Council's legal rights, if any steps, including the use of debt collectors, are necessary to recover unpaid processing costs, I/we agree to pay all costs of recovering those processing costs. If this application is made on behalf of a trust (private or family), a society (incorporated or unincorporated) or a company, in signing this application I/we are binding the trust, society or company to pay all the above costs and guaranteeing to pay all the above costs in my/our personal capacity.

Full name:  Signature:

Address:  Post code:  Date:

## 15.0 SIGNATURE OF APPLICANT

Full name:  Signature:

Address:  Post code:  Date:

Full name:  Signature:

Address:  Post code:

### PRIVACY INFORMATION

The information you have provided on this form is required so that your application can be processed under the RMA, so that statistics can be collected by the Council. The information will be stored on a public register, and held by the Council. The details may also be made available to the public on the Council's website. These details are collected to inform the general public and community groups about all consents which have been issued through the Council. If you would like to request access to, or correction of your details, please contact the Council.

\* Refer to Fees and Charges Schedule.

# Application For Water Permit To Take, Use Or Divert Groundwater.



Form B11

Office Use Only

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach four copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. This form needs to be attached with Form A when submitting an application. Delays in processing the application will occur if inadequate information is supplied.

## To be used with the Auckland Transitional Regional Plan and the Proposed Auckland Regional Plan: Air, Land and Water Only

### Take, use or divert groundwater – why is a resource consent required?

Section 14 of the Resource Management Act 1991 (RMA) provides for the regulation of the taking, use, damming and diversion of both freshwater and geothermal water.

The activity may be subject to rules in the Auckland Transitional Regional Plan 1991 (TRP) and the Proposed Auckland Regional Plan: Air, Land and Water (PARP:AWL). As all the relevant provisions of the PARP:AWL are not yet operative the status of the activity is determined as the more restrictive of the relevant rules of both plans.

Chapter six "Water Allocation" of the PARP:AWL deals with issues associated with water quality and allocation, that is:

- the taking and use, of fresh water and geothermal water
- the damming of surface water
- the diversion of groundwater
- the quality, level and flow of water in any waterbody

Drilling is also addressed because of its association with the taking of groundwater.

The status of an application to take, use or divert groundwater is determined by whichever rule in the Plan provides for the activity.

Chapter six also contains a number of policies that outline what proposals to take, use or divert groundwater or geothermal water must demonstrate in order for consent to be granted – refer Policies 6.4.4, 6.4.33, 6.4.35 and 6.4.47.

It is important to know whether the activity is in a High Use Aquifer Management Area (HUAMA) which are identified on the PARP:ALW October 2004 Map series two (Sheets 1-19). They are described in section 3.8 of the PARP:ALW.

The drillers bore log will also assist in determining if your bore abstracts water from a high use aquifer. Contact the Council if you are uncertain.

More information concerning taking, using or diverting groundwater can be found in the Council's Water Fact sheets

- Water Fact sheet 1 Using water wisely
- Water Fact sheet 2 Geothermal water
- Water Fact sheet 3 Groundwater and Bores
- Water Fact sheet 4 Why you have to fit a water meter
- Water Fact sheet 6 Complying with your water permit
- Water Fact sheet 7 Saving Water
- Water Fact sheet 9 Environmental Monitoring Information

P0109.3 08/07/10



The PARP:ALW status and rule for any activity to take, use or divert groundwater is given in the table below. Most rules are subject to standards and terms given in the PARP:ALW.

Activity	Quantity	Proximity to any existing bore take	High Use Aquifer	Status of Activity	PARP: ALW Rule
Taking, use or diversion of groundwater other than provided for by permitted activity rules 6.5.27 to 6.5.32:					
Take fresh groundwater	≤ 20 m <sup>3</sup> /day* and ≤ 5000 m <sup>3</sup> /year	< 100m	No	Controlled	6.5.33
Take fresh groundwater	20 – 100 m <sup>3</sup> /day and 5000 – 15,000 m <sup>3</sup> /year	≥ 100m	No	Controlled	6.5.34
Take fresh groundwater	20 – 100 m <sup>3</sup> /day and 5000 – 15,000 m <sup>3</sup> /year	< 100m	No	Discretionary	6.5.40
Take fresh groundwater	> 100 m <sup>3</sup> /day or > 15,000 m <sup>3</sup> /year	-	No	Discretionary	6.5.41
Take fresh groundwater	-	-	Yes	Discretionary	6.5.42
Take groundwater for purpose of diversion	-	-	-	Restricted Discretionary	6.5.39 and 6.5.69
Take groundwater for pumping test	> 7 days or > 1000 m <sup>3</sup> /day	-	-	Restricted Discretionary	6.5.37
Take geothermal groundwater (non bathing use at Waiwera, Parakai)	-	-	Yes	Non-Complying	6.5.45
Take geothermal groundwater (other than rule 6.5.45)	-	-	-	Discretionary	6.5.43

**Note:** ≤ means less than or equal to; < means less than; ≥ means greater than or equal to; > means greater than;

\* daily take averaged over any consecutive five days.

**1.0 SPECIALIST/AGENT DETAILS**

Company:  Contact person:

Postal address of agent:  Postcode:

Phone (day):  Cell phone:  Fax:

Email:  Area of Expertise:

**2.0 DESCRIPTION OF PROPOSAL**

2.1 If the site from which the water is to be TAKEN, is NOT on the property where water is to be used (as stated in Form A) provide details:

Full name(s) of Owner:

Postal address of Owner:  Postcode:

Full name(s) of Occupier:

Postal address of Occupier:  Postcode:

Legal description of land where take point is situated: Lot:  DP:

CT:  Other: (specify)

Location/Address of Site:

2.2 If you are not the owner of the water source, attach written approval to use the source from the owner or obtain a signature below:

*You can apply for a permit to take water from a source which is not on your property. However you may wish to obtain an easement on both property titles giving you and subsequent owners legal access to the source of water. A water permit does not do that. Similarly, an easement does not authorise the taking of water where a consent is required from the Council.*

Written approval attached

Name of Owner:

Address:  Postcode:

I authorise / permit:  to take water from my property.

Signature:

2.2.1 All **relevant** formal documentation confirming easements and/or covenants including Certificates of Title of the property where the take occurs are attached .

2.3 **Bore Use** N/A

2.3.1 If you share the bore with any neighbours, list their name, address and use of the water (eg stock/domestic, irrigation). Attach a separate sheet if necessary.

Name of Owner:

Address:  Postcode:

Bore use:

Name of owner:

Address:  Postcode:

Bore use:

**2.0 DESCRIPTION OF PROPOSAL contd**

2.3.2 Map Reference of Take Point:  mE  mN

Use New Zealand Transverse Mercator (NZTM) eg 1756730mE 59197mN.

*Use a geographic positioning system (GPS) device if possible to obtain a map reference accurate to 10m. The northing follows the easting. If you do not have a map reference, ensure that the location of your take point is marked to an accuracy of 10m on your location map.*

Stream number (office use only):

**2.4 Source of Water**

*(Note: The drilling or alteration of a bore requires a separate resource consent (use form B10), which is additional to a permit for the taking of water.)*

*Contact the Council for details and/or an application form. If you have an existing bore drilled since September 1987 and you were issued with a bore permit or bore ID number at the time, then the Council should hold a copy of the driller's bore log with the details of the bore construction. Indicate your permit or bore ID number so that we can retrieve the correct information. If your bore was drilled before 1987, attach a copy of the driller's bore log if you can obtain one – your driller may have a copy. Failing that, advise who the driller was.*

*The log should contain details of the static (unpumped) water level. Calculate the available drawdown by subtracting this static water level from the pump or foot valve depth. During development of the bore the driller will have undertaken a flow test (airline test) – the bore yield on this should again be recorded on the log. If you have had a separate pumping test (or aquifer test) undertaken, attach a copy of the report. The Council may require you to undertake a pumping test to demonstrate that the bore can yield the quantities applied for as part of your Assessment of Effects.*

**2.4.1 Purpose for which water is to be taken and/or used: (tick as appropriate)**

- Irrigation       Industry       Vegetable washing       Private community water supply       Municipal supply
- Stock purposes       Domestic       Dairy shed       Ground dewatering       Pumping test
- Geothermal       Groundwater diversion       Other (specify)

**2.5 If use is for IRRIGATION Not applicable**

If water is to be taken for irrigation, provide details of the calculation of your water requirements, including any information supplied to you by consultants and any meteorological data or scientific information on crop water use that you have used. The level of detail required may depend on the scale of activity. Answer the following questions and/or provide details in a separate report. Contact the Council for advice on the level of information you should provide.

2.5.1  Details attached in separate report

2.5.2 If you are not providing a separate report, state the area irrigated of each of the following:

Orchard:  ha      Pasture:  ha      Glass/Plastic house  ha  
 Market Garden:  ha      Name principal crop:  ha

2.5.3 For pasture state stock type / number grazing:

2.5.4 For crop irrigation state principal crops, area of each irrigated and if this may vary from year to year:

<input type="text"/> ha	<input type="text"/> ha
<input type="text"/> ha	<input type="text"/> ha
<input type="text"/> ha	<input type="text"/> ha

2.5.5 Indicate whether the area to be irrigated is:  Existing       Partly developed       Proposed

2.5.6 Total area to be irrigated on a daily basis:  m<sup>2</sup>, ha

2.5.7 Maximum area to be irrigated on a daily basis:  m<sup>2</sup>, ha

2.5.8 Maximum period of irrigation:  hours per day from:  to:

2.5.9 What is the target (net) application rate?  mm/day



## 2.0 DESCRIPTION OF PROPOSAL contd

2.5.10 Describe the soil types of the areas to be irrigated and state the source of this information:


2.5.11 Months of the year that irrigation may occur: From:  to

2.5.12 Types of irrigation:  Sprinkler  Trickle  Travelling irrigator  Other

2.5.13 Maximum rate that system can deliver:  cubic metres per hour

If you are providing information regarding irrigation requirements in a separate report, you should consider the following:

2.5.14 What is your planned method of irrigation (sprinkler, trickle etc) and what is the efficiency of delivery to the crop, if known?

--

2.5.15 Give the make and model of any travelling irrigator and provide any technical specification needs:

--

2.5.16 What is the maximum irrigation rate that this system can deliver? (You can determine this from the technical specifications or if you already have a water meter, by taking two readings an hour apart.)

--

2.5.17 Will you be irrigating throughout the year or only during the summer? What is your total annual demand?

--

2.5.18 What time of day will you irrigate and for how long?

--

2.5.19 Are there any records of previous water use on the site or elsewhere that would help to demonstrate the quality of water required? If so, you should provide them. (For replacement consents, ask Council staff for a copy of your water meter reading.)

--

2.5.20 State if any programmes are practised at the site for measuring soil moisture levels and if these are used as a trigger for irrigation, for water conservation or for leak detection inspections and test programmes.

--

2.5.21 Give details of any proposed future expansion or changes to crop types and approximate timetable.

--

2.6 State if water is to be used for **INDUSTRY OR VEGETABLE WASHING** Not applicable  
If water is to be taken for industrial or vegetable washing purposes, you may be required to undertake a water audit of the site water use. Council staff can advise you on this requirement and have water audit guidelines for those required to undertake an auditing process.

Even where an audit is not required, a justification of the quantities applied for must be attached in a separate letter or report. This must include details of any water conservation or leak detection programmes practised at the site.

2.6.1 State the type of industry and the process in which water is used:


2.6.2 Has a water audit been completed on your activity?  Yes  No

Provide details:

--

2.0 DESCRIPTION OF PROPOSAL contd

2.6.3 Are there any water conservation or leak detection programmes?  Yes  No

If **YES**, provide details:


2.6.4 Report/Letter justifying quantities applied for:  Attached

2.7 If water is to be used for **PRIVATE COMMUNITY WATER SUPPLY** Not applicable

Private community water supplies are typically owned and operated by private individuals, trusts or institutions and supply more than one household or institutions that may accommodate large numbers of people (eg campgrounds or hospitals). For applications to supply water to households, the Council considers that up to 1,000 litres per day per household may be considered "reasonable domestic use". For all applications the calculation of water requirements is needed.

2.7.1 What type of institution/development uses the water?

Households – number of households supplied:

Campgrounds – maximum number of visitors and staff:

Schools – maximum number of students and staff:

Other: (specify and give details of no. of people)

2.7.2 If water is to be used for **PUBLIC COMMUNITY (MUNICIPAL) SUPPLY**, state population supplied:

Provide the following:

A demand management plan/programme

A drought management plan

A network efficiency and water conservation management plan; and

An analysis of the wastewater disposal requirements associated with the water take.

*Public community water supplies are typically owned and operated by local authorities.*

2.8 If some water is to be used for **DAIRY SHED or STOCK PURPOSES**, state type of animal, number and purpose (e.g. drinking water, wash down): Not applicable

Different animals have different drinking water requirements. As a general rule, the Council considers 0.2 l/day/bird poultry 10 l/day/head sheep, 50 l/day/head cattle, 15 l/day/head deer, 70 l/day/head dairy cows (or 120 l/day for the period when a dairy shed is used) to be reasonable. However, your estimates may differ to that of council. If this is so, state the estimated amount required and the source of your information.

Animal type:

Number:

Purpose:

Estimate amount required:

m<sup>3</sup>/day

m<sup>3</sup>/year

Basis for estimation:


2.9 If some water is to be used for **DOMESTIC (HOUSEHOLD) USE**, state number of houses and average number of people within each household: Not applicable

No. Households:

Average No. of People per household

2.10 If water is to be diverted and taken for the purpose of **GROUND DEWATERING**, describe purpose (e.g. quarry, building basement or road excavation):

Construction of Central Interceptor. See Section 6 AEE Part A.

2.0 DESCRIPTION OF PROPOSAL contd

You must provide a detailed assessment of the quantity to be taken; anticipated changes in groundwater levels and ground settlement that may result; and effects on structures, buildings and services. (Refer to Policy 6.4.47 of the PARP:ALW). The Council will be able to advise you on this.

Separate report from a professional geotechnical engineer assessing the quantity and water levels attached (*tick if relevant*).

2.11 If water is taken for the purpose of a **PUMPING TEST**, describe purpose (e.g. bore capacity, effect on neighbouring borers, aquifer parameters): *Not applicable*


2.11.1 Will the pumping test be:  Step test  Constant discharge test

2.11.2 Describe discharge rate, length of steps or test, any observation piezometers to be monitored:


Separate report (*tick if relevant*)

2.12 If applying for a permit to **DIVERT** groundwater, describe purpose (e.g. building basement or in-ground tank construction).


2.12.1 Will the diversion be:  Permanent  Temporary If temporary for how long  months/years

*Groundwater diversion is defined as significantly changing the permeability of the aquifer and/or re-routing the ambient groundwater flow regime (by draining, piping or physically impeding the flow of groundwater). If the groundwater is removed from the aquifer, for example for dewatering, then that is taking water. You may be required to provide a detailed assessment of the quantities of water to be diverted and anticipated changes in groundwater levels but should at least attach details of your calculations of the quantity to be diverted (see section 3.4 of this form). Contact the Council if you are uncertain what is appropriate for your proposal.*

Details of calculations of quantity to be diverted attached (*tick if relevant*)

2.13 **Pump Details** See Section 6.5.4 AEE Part A

2.13.1 Indicate whether the pump is:  Existing  Proposed

2.13.2 Pump type:  Submersible  Deep well (rods & foot valve)  
 Suction  Jet (uses jets to lift water)

2.13.3 Pump make and model:

2.13.4 Maximum Pumping Capacity:  cubic metres per hour, litres per second.

2.13.5 For water supply bores, will a backflow prevention device be installed to prevent nutrient solutions or any other contaminants flowing back down the bore when the pump is switched off?

Yes  No

**2.0 DESCRIPTION OF PROPOSAL contd**

Please explain (or indicate if this has been addressed in a separate report):


**2.14 Quantities of Water Applied For**

*The quantity of water you are applying to take must be specified. If you are applying for a replacement consent, check your existing consent to see if the quantity stated will meet your current (and likely future) needs or if you now require less water. If you require a greater volume than is currently consented, this water may not be available to you under the same conditions as your expiring/existing consent as many aquifers in the Auckland region are now highly allocated. If you do require a greater volume, discuss available allocations with the Council before you submit your application.*

- 2.14.1 Maximum rate of take:  cubic metres per hour. max rate during construction, conservatively assuming all shafts constructed simultaneously
- 2.14.2 Maximum daily quantity: 5000 cubic metres per day cubic metres per day.
- 2.14.3 Total annual quantity:  cubic metres per year.

2.14.4 Demonstrate that the bore is capable of extracting the quantities applied for:

N/A

**2.15 Water Meter Details** N/A

*For the meter reading include all digits, including zero, before and after the decimal point for this current reading and subsequent readings that are required as a condition of consent. Digits after the decimal point are often in red. Indicate if any zero is a fixed zero (written on face plate of meter) e.g. 0041962.1m<sup>3</sup>.*

- 2.15.1 Has an operational water flow meter been fitted?  Yes  No
- If YES, make, model, size:
- 2.15.2 Current meter reading:  units (m<sup>3</sup>/litres/gallons) on:
- 2.15.3 Is there a length of straight pipe, equal to 10x the internal pipe diameter fitted before the meter?  Yes  No

*(See Water Allocation Fact Sheet 4, "Why you have to fit a water meter")*

*NB: RMA Regulations require a meter capable of providing output in a form suitable for electronic data storage for all takes 5 litres per second and over. Contact Council staff for further details.*

**2.16 Bore Heads – Existing Bores** N/A

*It is important that the bore head is protected to prevent possible contamination of the groundwater resource. Provision for water quality sampling and water level monitoring are also important. Bores drilled after 1987 are subject to certain conditions covering these aspects of bore construction and maintenance (check your bore permit). Older bores may require upgrading to meet these requirements.*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 2.16.1 Is there a concrete pad in place around the bore head?  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.16.2 Does the top of the casing rise at least 0.3 metres above the ground level?   | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.16.3 Is there access for water level monitoring (e.g. a plugged hole or large slot at least 20mm in size in the casing top plate)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2.16.4 Is there access for taking a water sample (e.g. a tap close to the bore head before any filter or tank)?                      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

**3.0 SITE PLAN**

Show the following on the Site Plan: (provide one set of plans reduced to A3)

- Title Box including:
  - The name of the person and/or company that prepared the plans.
  - Address of property/site (adjacent to the location of the proposal in the CMA)
  - Date the plans were drawn.
  - Unique plan reference or identification or variation number where relevant.
- Legend explaining symbols on the Site Plan.
- Direction of ground slope.
- Names of Neighbouring property owners.
- North point (orientated to the top of the page if possible).
- Scale Bar.
- Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).
- Total site area in hectares or m<sup>2</sup> (if relevant).
- Road frontages and names.
- Property boundary dimensions – existing and future (where relevant).
- Adjoining street numbers.
- Location of bore (actual or proposed), sump or well.
- The area in which the water is to be used.
- Location of existing and proposed structures, roads, buildings, fences etc.
- Location of nearby bores (including those on neighbouring properties), springs, wetlands, rivers or streams.
- Location of any septic tanks, offal pits, contaminated sites/areas or other waste disposal areas within 150m of the take point.
- Location of any fill, semi-consolidated sediments or reclaimed land on the site (for diversion and taking of groundwater).
- Location of Mean High Water Springs (MHWS) / Coastal Marine Area (CMA) if within 500m of the take point/bore or well.

**4.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT**

Identify, describe and assess the actual or potential effects on the environment of your proposed activity. For the purposes of this section, you need to consider the effects of your proposed take under the "worst case scenario". For most water takes, the worst case scenario is when the quantity of water being taken is greatest and occurring over the longest time period (e.g. drought conditions for irrigation).

**4.1 Effects on groundwater availability**

Groundwater is held in a range of rocks and deposits termed "aquifers" at varying depths beneath the ground surface. Rainfall travels through the most porous areas of these rocks and deposits to replenish or "recharge" water which is abstracted from bores or which discharges from the aquifer, typically to a deeper aquifer, at surface springs or at the coast. The quantity of groundwater available for abstraction is limited by the quantity which is recharged from rainfall each year. The abstraction of more than the annual availability can lead to a fall in groundwater levels and deterioration in groundwater quality and supply.

In areas of high groundwater use, the Council has regional plan rules or water allocation strategies in place which set the limits of how much water can be allocated.

These availabilities are based on annual rainfall recharge and on maintaining minimum aquifer levels, base flow of streams and springs, recharge of other aquifers and outflow at the coast to prevent saltwater intrusion. You should check whether a rule or strategy exists for your area or aquifer, and if so, whether water is currently available for allocation. If no such rule or strategy is in place and you are wishing to take a significant quantity of water, you may have to provide your own estimate of groundwater availability, prepared by an appropriate consultant. Staff at the Council will be able to advise you whether or not this is required.

- 4.1.1 What is the predominant geology (aquifer) from which the groundwater is to be taken? Choose one of: Alluvium (soil or fill), Geothermal, Greywacke, Kaawa shell, Sand/gravel, Volcanic, Waitemata sandstone or other: (Note: This is the geology adjacent to the screen zone or between the bottom of the casing and the base of the bore, as shown on the driller's bore log.)

Several - see Section 9.5 AEE Part A

## 4.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT contd

4.1.2 Is your bore take in a Proposed Auckland Regional Plan: Air, Land, Water (PARP:ALW) High Use Aquifer Management Area (HUAMA) listed below (from north to south)? (Tick appropriate box below)

- Tomorata Waitemata.
- Omaha Waitemata.
- Kumeu-Hobsonville Waitemata.
- Onehunga-Mt Wellington Volcanic.
- Waiheke (all aquifers).
- Manukau City Waitemata (west of motorway).
- Manukau City Kaawa.
- Clevedon Waitemata.
- Franklin Volcanic (Bombay, Pukekohe & Glenbrook aquifers).
- Franklin Kaawa (excludes Awhitu Peninsula).
- Drury Sand-Volcanic (north of Maketu Road).
- Waiwera Geothermal.
- Parakai Geothermal.

4.1.3 Is there a Council groundwater availability for the aquifer or sub-zone of the aquifer? *see hydraulic report*

- Yes - Give name of aquifer/zone:  Availability  m<sup>3</sup>/year
- No (Note: This information may be found in the PARP:ALW schedule two and map series two – sheets 1-19.)

4.1.4 Have you or a hydrogeologist (or other appropriate consultant), prepared an assessment of groundwater availability in the area, aquifer or aquifer zone? (Refer to Q.3.1 above)

- Yes – separate report attached.
- Availability:  m/year and map attached showing area.
- No.

#### 4.2 Effects on the groundwater resource and other water users

The taking of groundwater leads to a fall in water levels in the aquifer surrounding the point of abstraction. The extent of the area affected and length of time that the levels remain drawn-down depends on the pumping rate, pumping duration, aquifer parameters and aquifer geometry (boundaries). Where significant drawdown occurs, this can result in interference with water levels in the surrounding bores. This can affect the ability of neighbours to draw water (e.g. water levels falling below the pump in their bore) and reduced flow at springs. The water level drawdown will depend on the quantity of water you propose to take relative to the aquifer properties, bore depths, spring elevations and distance to springs and other bores.

Provide as much detail as possible on nearby water sources and users and consider whether or not any of these will be affected. A more detailed assessment may be necessary depending on the quantity which you wish to take and the location of potentially affected water sources and parties. The Council will be able to advise you on this.

Use the table (on the next page) to provide the following information relating to all adjacent properties and to the nearest property with a bore in each direction (if not adjacent).

- The names, postal addresses (including RD or PO Box number), site address (including street number on gate) of the property owners/occupiers.
- Indicate whether or not there are any bores (and give bore depth if known), springs, wetlands or streams on each of these properties.
- Indicate whether or not water is taken from any water sources and any permit numbers (if known).
- Indicate the distance between each water body or source and your existing or proposed bore/well/sump.
- Describe the purposes for which they take water (e.g. stock water, domestic supply, irrigation etc).

**4.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT contd**

4.2.1 The names of property owners and locations of water sources should also be shown on your location map. Attach details on a separate sheet if necessary. See Section 9.6.1 AEE Part A

Further details attached (*tick if relevant*).

4.2.2 Will your proposal to take groundwater cause reduced spring flow or adverse interference effects on water levels in neighbouring bores to the extent where the neighbouring spring/bore owner is prevented from obtaining their lawfully established water requirements?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

4.2.3 Explain your response to question above, below and / or in a separate report.

Separate report attached (*tick if relevant*).


**4.3 Effects on Water Quality**

The pumping of groundwater can lead to the movement of materials disposed of nearby such as septic tank effluent, if these become dissolved or mixed into the groundwater flow. This can lead to a deterioration in the quality of water supplies and the groundwater resource as a whole. Abstraction close to the coastline can lead to the contamination of the groundwater resource by the landward movement of seawater. A detailed assessment may be necessary depending on the quantity which you wish to take and the proximity to potential sources of contamination and the coastline.

4.3.1 Has a water quality analysis been undertaken on groundwater taken from your bore (well or sump) or do you have access to the results of an analysis on any nearby bores?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

If YES, attach a copy of the results  Copy of water quality results attached (*tick if relevant*).

Not required

4.3.2 150 metres of the take point are there any septic tanks, ofal pits, contaminated sites or other waste disposal areas? If so, indicate on Site Plan (refer Q.2.16) and give the distance between these and your take point.

Nature of waste disposal:

Distance from take point (metres):



4.3.3 Is your proposed take point within proximity (500 metres) of the coastline?  
groundwater diversion

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------



<b>(A)</b> <b>Name and Post Address</b> <i>e.g. Ann Bode, PO Box 100</i> <b>Auckland</b>	<b>(B)</b> <b>Site Address</b> <i>100 Main Road, Pukekohe</i>	<b>(C)</b> <b>Water Body/Source(s)</b> <b>Stream/Bore/Spring</b>	<b>(D)</b> <b>Is Water Taken</b> <b>No / Yes</b>	<b>(E)</b> <b>Distance to your</b> <b>Proposed Bore (m)</b> <b>300m</b>	<b>(F)</b> <b>Use(s) of Water</b> <b>Domestic Supply</b>

**4.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT contd**

If YES, indicate the location and distance to the coastline on your Site Plan. (refer Q.2.17).

See tunnel drawings

4.3.4 Do you anticipate that your proposal to take, use or divert groundwater will affect the water quality of the groundwater resource (e.g. contamination from septic tanks or other waste disposal areas, saltwater intrusion)?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

4.3.5 Describe below and/or in a separate report.  
 Separate report attached (*tick if relevant*).


**4.4 Effects on Land and Buildings**

The diversion and taking of groundwater, for instance for dewatering quarries and construction sites, over prolonged periods of time can lead to the settlement of fill, semi-consolidated sediments or reclaimed land. A detailed assessment may be necessary depending on the quantity which you wish to take, the nature of the surrounding land and proximity of buildings. (Refer to Policy 6.4.47 of the PARP:ALW)

4.4.1 Is your proposed take point in close proximity to any fill, reclaimed land, unstable ground, or other land subject to settlement or movement?

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
Potentially	

4.4.2 If YES, do you anticipate that your proposal to take, use or divert groundwater may result in any effects on land, structures, buildings and services (e.g. roads, pavements, power, gas, electricity and fibre optic cables).  
 Effects may include settlement of ground surface/building foundations that results in damage to structures, buildings and services. Effects include cumulative effects that may arise from a number of groundwater diversions in the same area.

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

4.4.3 If YES, describe below and/or in a separate report from a professional geotechnical engineer assessing the effects.  
 Separate report attached (*tick if relevant*).

Mitigation measures proposed will ensure ground settlement is avoided. See Section 13.1.9 AEE Part A for summary.

4.4.4 If relevant, describe any effects on ecosystem habitats – terrestrial and freshwater.

No anticipated ecosystem habitat effects

**4.5 Effects on Cultural Heritage**

The following may help you identify any cultural heritage features on your site:

- Check the Auckland Regional Cultural heritage inventory (CHI) for historic or cultural heritage information.
- The New Zealand Historic Places Trust has a register of historic places, Archaeological sites, historic areas waahi tapu and waahi tapu areas.
- The Auckland Regional Plan: Coastal (ARP:C) schedules one and two contain a list of protected and preserved historic and cultural heritage sites.
- District Plans have schedules of protected cultural heritage items.
- Appendix B of the Auckland Regional Policy Statement (ARPS) contains a list of significant natural heritage values and identifies sites and areas of special value to Tāngata Whenua.
- Areas/places that are significant to Tāngata Whenua may only be identified during consultation

**4.5.1** In reasonable proximity of the proposed take and water use site, are there any:

Archaeological or cultural heritage features e.g. historic place, building

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Areas or aspects of significance to Maori or Tāngata Whenua e.g. waahi tapu, pa site

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

If **YES** to any of the previous features, then describe what is present and identify what adverse effects your activity may have:


**4.6 Effects on Natural Heritage**

The following may help you identify any natural heritage features on your site:

- The following may help you identify any natural heritage features on your site:
- Check the Natural Heritage Database held by the Council – ask Council staff.
- Appendix B of the Auckland Regional Policy Statement (ARPS) identifies areas of significant natural heritage values. Volume two of the Plan Maps for the Auckland Regional Plan Coastal Protection Areas, schedule three describes their values.
- Schedule four of the ARP:C shows areas of significant conservation value as identified by the Ministry of Conservation.
- Plan change nine of the ARPS and schedule three of the ARP:C identify sites that have geological, landscape or coastal heritage value, including volcanic cones and coastal protection areas.
- Section 3.2 and 3.3 of chapter three of the PARP:ALW provide a description and management approach for Wetland Management Areas and Natural Lake Management Areas respectively.
- Schedule one of the PARP:ALW identifies significant wetlands which constitute the Wetland Management Areas. Information on the boundaries is available from the Council’s Natural Heritage Information Database. The Natural Lake Management Area contains the identified lake and a 50m buffer strip around the lake.
- Section 3.4 of chapter three of the PARP:ALW provides a description, criteria, and management approach for natural stream management areas.
- Maps series one of the PARP:ALW identifies Wetland and Natural Lake Management Areas, and also illustrates Natural Stream Management Areas in an indicative manner.

**4..6.1** Is any proposed bore located in a Wetlands Management Area as identified in schedule one of the PARP:ALW?

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

**4..6.2** In reasonable proximity to the proposed take and water use site, are there any natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, lakes, wetlands, areas of significant indigenous vegetation or habitats of indigenous fauna and environs.

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

If **YES**, describe what is present and any adverse effect your activity may have:


**4.7 Alternative Locations And Methods**

It may be appropriate to consider if there are alternative sources of water or alternative methods of undertaking your activity which may have lesser adverse effects, for instance, collection and use of rainwater in areas of high groundwater use.

For example, shallow aquifers (particularly volcanic rocks) contribute to spring flow and are also commonly used by stock water bores. Constructing proposed bores to a deeper aquifer may significantly reduce effects on springs and nearby bore users. Constructing proposed bores to fully penetrate the target aquifer make them less susceptible to aquifer water level fluctuations in future and allow more efficient abstraction of water from groundwater resources.

4.7.1 The level of detail required may depend on the scale of activity. Contact the Council for advice on what sort of information you should provide:

Report describing consideration of alternatives attached (*tick if relevant*).

4.7.2 State any alternative water sources or methods available: (tick as appropriate)

Rainwater storage

Municipal supply

Groundwater from a different aquifer

Water impounded by dam

Re-use of wastewater

Bore that fully penetrates aquifer

Other (*specify*) \_\_\_\_\_

No other sources or methods

4.7.3 Describe why you have chosen to take groundwater from a particular aquifer or depth in an aquifer and not from any of these other water sources:

Not applicable

4.7.4 State any alternative methods of undertaking your activity. Identify whether these are more or less water efficient. If they are more water efficient, explain why you have not chosen the alternative:

Alternatives considered in Section 7 AEE Part A

The Council must ensure that the water resource is used efficiently. Measures that may be undertaken to minimise wastage and maximise efficient use will differ depending on what the water is used for. The following are examples for different water uses:

- For irrigation takes, water may be applied at night, and in calm weather conditions only. Irrigation consultants can provide technical information on exactly how much water certain soil and crop types require in different areas of the Auckland region.
- For industrial purposes, a known volume of water may be required per unit of product for certain purposes. Maintenance of equipment may minimise leakages.

For private or public community water supplies, water restrictions may be applied during water short periods e.g. hand-held watering of gardens only, restrictions on car washing etc. Some public supplies may have flow restrictors. Refer to the fact sheet, 'Using water wisely.'

**5.0 PROPOSED MONITORING**

Adverse effects such as interference with nearby bores can be mitigated by:

- In some cases, constructing a proposed bore to a deeper aquifer or casing it deeper;
- Taking the same daily quantity but at a lower pumping rate or alternative timing;
- Relocating a proposed bore;
- Providing an alternative supply for those affected; and
- Water conservation options in times of reduced water availability.

For larger takes, details of proposed mitigation measures must be provided as a part of a more detailed assessment of effects. This should describe which adverse effects the measures are designed to mitigate and provide details of the ways in which this mitigation will be achieved.

5.1 Describe steps you propose to take to mitigate any adverse effects described in your answers to all questions in Section 3. Attach details in a separate report if necessary.

Separate report attached (*tick if relevant*).


**6.0 CONSULTATION**

Where consultation has taken place with Iwi and/or any other interested person, details of the consultation undertaken, including the views of those consulted and your response to their concerns/issues must be provided. Copies of any correspondence confirming this consultation should be attached to this form.

6.1 Describe and discuss the consultation undertaken: (*who was consulted and why?*)

See Section 8 AEE Part A

6.2 Describe and discuss the response from those consulted:


6.3 Describe your response to the views of those consulted:


**7.0 MONITORING**

You will be required to monitor your own water use with a water meter (refer to the fact sheet, 'Why you have to fit a water meter') and submit records to the Council. Where the scale of the activity and related effects are significant (e.g. potential for significant reduction in yield of neighbouring bores) then monitoring of these effects and the effectiveness of mitigation measures may be appropriate. This may include monitoring static water levels in your own and other bores, monitoring spring flows or monitoring bore water quality if saltwater intrusion is possible.

For diversion and taking of groundwater, for instance at construction sites which can lead to settlement of semi-consolidated sediments, measurement and recording of the movement of ground, buildings and other structures may be appropriate.

7.1 Do you intend monitoring the effects your taking, use or diversion of groundwater may have on other water users, on the resource as a whole and ground settlement as appropriate?

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If YES, provide details:

See report

The data obtained from water meters must be collected and recorded. Often this is done manually, but manual recording (e.g. daily visits to the water meter) is not always convenient to the consent holder, and recording may become sporadic. In addition, errors can occur when data is recorded incorrectly (e.g. numbers are transposed). Data-loggers are an automatic electronic way of obtaining and recording data from certain types of water meters with a pulse output. Depending on the type of water take you are applying for, and the rate and volume of water sought, the Council may require that you install a data-logger to record details of your taking.

7.2 For water metered groundwater takes, how do you propose to record the information? Not applicable

- Take manual readings at a daily/weekly  frequency. (*Specify*)
- Use a datalogger or telemetry (automated systems).
- Other: (*specify*)

NB: RMA Regulations require a meter capable of providing output in a form suitable for electronic data storage for all takes 5 litres per second and over. Contact Council staff for further details.

# Application for regional land use consent land disturbing activities – sediment control



Form B15

Office use only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

## To be used with the Auckland Transitional Regional Plan and the Auckland Regional Plan: Sediment Control

### Land disturbing activities - Why is a resource consent required?

Sections 9 and 15 of the Resource Management Act 1991 (RMA) provide for the regulation of activities relating to land use and sediment discharge into the environment.

Land disturbing activities have the potential to generate and discharge large volumes of sediment into the sensitive receiving environments of the Auckland region. The Auckland Regional Plan: Sediment Control (November 2001) (ARP:SC) contains objectives, policies and rules regarding the management of sediment generation and discharge from land disturbing activities. Land disturbing activities include roading, tracking, trenching, earthworks and quarries.

The waterbodies and coastal waters in the region have been identified as being particularly vulnerable to the effects of the discharge of sediment.

To avoid the discharge of sediment into these receiving environments, the ARP:SC has identified areas around waterbodies, wetlands and coastal waters in the region as Sediment Control Protection Areas (SCPA's). Land use activities that disturb the soil in these areas are likely to have a higher potential to have an adverse effect.

A higher level of control is required in these areas as there is a greater risk of land disturbance activities discharging sediment into adjoining receiving waters and adversely affecting water quality. The technical publications TP 90 & TP 223 are used to assist the assessment of resource consent applications.

More information concerning sediment management and assessment of effects can be found in the land and stream fact sheets and land facts:

Land Fact Sheet 1	A Guide to an Assessment of Environmental Effects
Land Fact Sheet 2	Erosion Control
Land Fact Sheet 4	Publications
Land Fact Sheet 5	Sediment as a Pollutant
Land Fact Sheet 6	Site Staging and Stabilisation
Land Fact Sheet 8	Universal Soil Loss Equation (USLE)
Stream Fact Sheet 4	Erosion and Sediment Control
Land Facts	Erosion Control vs Sediment Control
Land Facts	As Builts - Decanting Earth Bunds
Land Facts	As Builts - Diversion Channels and Bunds
Land Facts	As Builts - Sediment Retention Ponds
Contaminated Sites Fact Sheet	Cleanfill

The activity status and rules for any land disturbing activities are given in the table below. Most rules are subject to standards and terms given in the ARP:SC.



Activity	On All Soils	Within the SCPA	Slopes Greater than 15 Degrees	The Activity/s Status	ARP:SC Rule
<b>Earthworks</b>					
Area of disturbance between 1.0 and 5.0 hectares	Yes	No	No	Controlled	5.4.2.1
Area of disturbance greater than 0.25 hectares	Yes	Yes	-	Restricted Discretionary	5.4.3.1
Area of disturbance greater 5.0 hectares	Yes	No	No	Restricted Discretionary	5.4.3.1
Area of disturbance greater than 0.25 hectares	Yes	No	Yes	Restricted Discretionary	5.4.3.1
<b>Roading/Tracking/Trenching</b>					
Area of disturbance between 1.0 and 5.0 hectares	Other than sand soils	No	No	Controlled	5.4.2.1
Length of disturbance greater than 100m	On sand soils only	Yes	-	Restricted Discretionary	5.4.3.1
Length of disturbance greater than 100m	Other than sand soils	Yes	-	Restricted Discretionary	5.4.3.1
Area of disturbance greater than 5.0 hectares	Other than sand soils	No	No	Restricted Discretionary	5.4.3.1
Area of disturbance greater than 0.25 hectares	Other than sand soils	No	Yes	Restricted Discretionary	5.4.3.1
<b>Quarries</b>					
The disturbance is associated with a quarry, with an area of 1,000m <sup>2</sup> or more, and/or with a catchment of 1.0 hectare, where no runoff leaves the site, and/or there are wash processes on site	-	-	-	Restricted Discretionary	5.4.3.1

## 1.0 SPECIALIST/AGENT DETAILS

Company:	Watercare Services Ltd		Contact Person:	Belinda Petersen	
Postal address of agent:	Private Bag 92 521, Wellesley Street, Auckland Postcode: 1141				
Phone (day):	539 7477	Mobile:		Fax:	
Email:	bpetersen@water.co.nz				
Area of Expertise:	Resource Consents Manager				

## 2.0 DESCRIPTION OF PROPOSAL

2.1 Describe the proposed works in a separate report including, but not limited to, the following:

- Details of the construction period/dates/timeframes/methodology.
- Total site area.
- Total disturbed area. See Section 6 for further information
- Details of any staging plans for disturbed areas. on proposed earthworks
- Cut/fill volumes details.
- Details of any planned stockpiles.
- Identification of any refuelling/maintenance areas.
- Discussion on the proximity of the site to waterbodies/watercourses and methodology of any protection measures proposed.
- The purpose of the works, including proposed structures, utilities, roads.
- Extent and type of vegetation (including riparian) to be removed/planted.
- Details of any planned off-site disposal for cut material.
- Details of planned stabilisation methods, including temporary, seasonal and permanent stabilisation requirements.

2.2 Map Reference of Earthworks Site:  mE  mN

Use New Zealand Transverse Mercator (NZTM). e.g. 1756730mE 5919740mN.

*If possible, use a geographic positioning system (GPS) device to obtain a map reference accurate to 10m. The northing follows the easting. If you do not have a map reference, ensure that the location of your dam is marked to an accuracy of 10m on your location plan.*

2.3 Give the name of any stream, river or lake (or if the stream is unnamed, state what water body it is a tributary of):

Name:  or tributary of:

Stream Number: (office use only)

*If you are unsure of the name of the water body and your application is a replacement of an existing consent, the easiest way to find out the name of the water body is by checking your existing resource consent. If you are unsure of the name of the water body and the application is for a new consent, the Council will be able to help you. In many instances tributaries to larger water bodies do not have official (or legally recognised) names. If this is the case describe the water body as "an unnamed tributary of...". If the water body has an unofficial local name you could continue to write "... locally know as...". You can determine if a name is legally recognised by seeing if it is written on published topographic maps or if any road bridges crossing it state the name of the water body (i.e. Transit or Automobile Association signs).*

- Catchment area and proportion of the catchment that is to be exposed.

Operation types: (tick)

<input checked="" type="checkbox"/> Bulk earthworks	<input checked="" type="checkbox"/> Trenching	<input type="checkbox"/> Tracking
<input type="checkbox"/> Cleanfill	<input type="checkbox"/> Quarry	<input checked="" type="checkbox"/> Vegetation Removal
<input type="checkbox"/> Other		

### 3.0 SITE PLAN Note: Earthworks and ESCP plans are indicative only

#### 3.1 Show the following on the Site Plan: (provide one set of plans reduced to A3)

- Title Box including:
  - The name of the person and/or company that prepared the plans.
  - Address of property/site (adjacent to the location of the proposal in the CMA)
  - Date plans were drawn.
  - Unique plan reference or identification or variation number where relevant.
- Legend explaining symbols on the Site Plan.
- North point (orientated to the top of the page if possible).
- Scale Bar.
- Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).
- Total site area in hectares or m<sup>2</sup> (if relevant).
- Road frontages and names.
- Property boundary dimensions – existing and future (*where relevant*).
- Adjoining street numbers.
- Disturbed areas (including staging details).
- Refuelling/Maintenance areas. To be confirmed on final ESCPs
- Location of any natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site and environs.
- Catchment areas.
- Steep slopes (>15°) highlighted.
- Sub-catchment areas for both the existing and proposed site conditions.
- Dedicated overland flow paths for storms exceeding normal site conveyance systems.
- Floodplains/overland flow paths/stormwater outlets to kerb (five years, 20 years and 100 years average recurrence interval (ARI) flood levels.
- If the site is within or near the Coastal Marine Area (CMA), the location of the Mean High Water Springs (MHWS).
- Location of existing and proposed structures, roads, buildings fences etc.
- Location of different soil types (NZ Geological Maps).
- Extent of any existing and proposed reserve area.
- Location of existing and proposed underground services including public drains.
- Existing and finished ground levels for either the whole site or the relevant work area. Show natural ground level datum points, contours and spot heights (to LINZ datum). Where appropriate, show contours to extend across boundaries.
- Amounts and location of any earthworks - show volumes and areas of cut, fill and stockpiles (include staging details where relevant).
- Location of areas for vehicle and equipment maintenance and washing.
- Location of loading and unloading areas.
- The nature and extent of surface soil/lithology types and contamination plumes.
- The lateral extent of the geological cross-section.
- If relevant the historical location of structures that may have affected the distribution of any contamination e.g. buildings, underground storage tanks, treatment path etc.

### 4.0 SITE LOCATION AND CHARACTERISTICS

#### 4.1 Identify, describe and assess the existing site and environs including, but not limited to, the following:

- Current land-use on the site in the vicinity and within the wider catchment.
- District Plan zoning for the site and environs. Described in AEE Parts A & B
- Details of existing roads, buildings, utilities etc.
- The topography of the site and environs.
- The geology and soil characteristics of the site and the environs.
- The current nature of any waterbodies / watercourses on the site or in proximity to the site (give the distance from site). Discuss water colour and clarity, morphology, bank and bed material, stream width and depth, stream ecology – aquatic flora and fauna (riparian vegetation, fish passage and migration).
- The wider catchment - upper and lower including details of the current land use and ecological characteristics.
- The historical land-use.

- The immediate and ultimate receiving environment, including ecological characteristics and sensitivity to sediment discharges.
- Is the site within or outside a Sediment Control Protection Area as defined in the Regional Plan: Sediment Control
- Discussion on the potential for and/or evidence of the site being contaminated land.

Accept/  
Reject

## 5.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT

- 5.1 Identify, describe and assess the actual or potential effects of the proposed activity on the environment including, but not limited to, the following:
- Waterways and the Coastal Marine Area – water quality, ecology, clarity, morphology etc.
  - Flooding.
  - Erosion.
  - Recreation and amenity values.
  - Provide universal soil loss equation (USLE) calculations specific to individual catchments within the site.
  - Details and discussion on the assumptions used within the USLE calculations.
  - Details and discussion on the specific high risk areas of the site in terms of sediment generation and the receiving environment.
- 5.2 Discuss any adverse effects of the activity on any abstraction point for a registered drinking water supply as required by sections 6, 7 and 8 of the Resource Management (National Environment Standards for sources of Human Drinking Water) Regulations 2007.

## 6.0 PROPOSED MITIGATION

- 6.1 Discuss measures to be undertaken to avoid, remedy or mitigate adverse effects on the environment including, but not limited to, the following:
- Provide a sediment control management plan (SCMP).
    - The SCMP should detail and quantify the following:
      - Erosion controls (including clean and dirty water diversions).
      - Sediment controls .
      - Staging plans. Draft Erosion and sediment control plans are provided.
      - Disturbed areas.
      - Details of all earthworks areas.
      - Reduced levels.
      - Topography (during and after construction works).
      - Overland flow paths and flood plains.
      - Stockpile areas identified.
      - Location of high risk areas.
    - Calculations detailing specific erosion and sediment control measure designs (five year average recurrence interval (ARI) event).
    - Justification for and discussion on the chosen and alternative erosion and sediment control measures.
    - Details of staged works, including information on: timeframes, areas volumes/ methodology.
    - Details and discussion on any proposed chemical flocculation treatment (either by batch-dose or fixed methods); alternatively, discussion on why chemical treatment is not proposed.
    - Chemical management plan.
    - Discussion on any proposed conditions of consent which may provide mitigation.

## 7.0 CONSULTATION

Where consultation has taken place with Iwi and/or any other interested person, details of the consultation undertaken, including the views of those consulted and your response to their concerns/issues must be provided. Copies of any correspondence confirming this consultation should be attached to this form.

7.1 Describe and discuss the consultation undertaken (who was consulted and why?)

see Section 8

7.2 Describe and discuss the response from those consulted:

7.2 Describe your response to the views of those consulted:

# Application for a discharge permit – diversion and discharge of stormwater



Form B16

For office use

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

## To be used with the Auckland Transitional Regional Plan and the Proposed Auckland Regional Plan: Air, Land and Only

### Diversion and discharge of stormwater - why is a resource consent required?

Section 15 of the Resource Management Act 1991 (RMA) provides for the regulation of the discharge of contaminants into the environment.

The activity may be subject to rules in both the Auckland Transitional Regional Plan 1991 (TRP), the Proposed Auckland Regional Plan: Air, Land and Water (PARP:ALW), and the Regional Plan: Coastal (ARP:C). As the relevant provisions of the PARP:ALW are not yet operative the status of the activity is determined as the more restrictive of the relevant rules of all plans.

Stormwater is surface water run-off from land and structures and can contain contaminants. Stormwater can increase the risk of flooding and erosion and lead to the accumulation of contaminants within waterbodies with subsequent adverse environmental effects if not managed properly.

Chapter five of the PARP:ALW - Rules 5.5.2, 5.5.3, 5.5.4 and 5.5.5-and the ARP:C set out the criteria for assessing applications for stormwater discharge permits. The extent of impervious surface area is a trigger for requiring a consent.

Relevant technical publications used in the assessment of stormwater discharge applications are:

- TP 108 – Guideline for Stormwater Run-off Modelling in the Auckland Region.
- TP 10 – Stormwater Management Devices Design Guidelines Manual (2nd Edition, May 2003).

More information concerning managing stormwater can be found in the stormwater fact sheets:

Stormwater Fact Sheet	Applying for a Resource Consent
Stormwater Fact Sheet 1	What is Stormwater?
Stormwater Fact Sheet 2	Stormwater Quantity Effects
Stormwater Fact Sheet 3	Stormwater Quality Effects
Stormwater Fact Sheet 4	Aquatic Habitat Effects
Stormwater Fact Sheet 5	Stormwater Management on Small Sites
Stormwater Fact Sheet 6	Stormwater Network Discharge Consents
Stormwater Fact Sheet 7	Stormwater Discharge Consents
Stormwater Fact Sheet 8a	Stormwater Rain Garden Facts - Rain Garden
Stormwater Fact Sheet 8b	Stormwater Rain Garden Plants - Recommended native plants
Stormwater Fact Sheet 9	Stormwater Rules in PARP:ALW
Stormwater Compliance	Stormwater Compliance Programme
Stormwater Fact Sheet	Applying for a resource consent to divert and discharge stormwater
Stormwater Fact Sheet	Infiltration Trenches
Stormwater Fact Sheet	Oil and Water Separators
Stormwater Fact Sheet	Rainwater Tanks
Stormwater Fact Sheet	Sand Filters
Stormwater Fact Sheet	Stormwater Discharge Consents and Body Corporate Responsibility
Stormwater Fact Sheet	Stormwater Ponds
Stormwater Fact Sheet	Stormwater Wetlands
Stormwater Fact Sheet	Swales and Filter Strips

Activity	The Activity Discharges to an Existing Stormwater Network	The Activity is Authorised by a Network Discharge Consent	If the Activity is Outside Urban Areas it does not Exceed the 6% Threshold*	The Activity's Status	The Activity is Covered by PARP:ALW Rule	The Activity does not meet TRP General Authorisation Number
<b>The diversion and discharge of stormwater from activities not authorised by Rules 5.5.1 or the TRP:</b>						
The activity will result in a total impervious area on the site (both existing and new) of more than 1,000m <sup>2</sup>	No	No	Yes	Discretionary	-	9 (discharge to sea); 10 (discharge to rivers/streams/lakes); 12 (discharge to ground)
The activity will result in a new impervious area on the site of more than 1,000m <sup>2</sup> but less than 5,000m <sup>2</sup> , and complies with the standards and terms of the rule	Yes	No	Yes	Controlled	5.5.2	-
The activity will result in a new impervious area on the site of less than 5,000m <sup>2</sup> , but does not meet the conditions of rules 5.5.1 or 5.5.9, or the standards and terms of rule 5.5.2, and complies with the standards and terms of the rule	Yes	No	Yes	Restricted Discretionary	5.5.3	-
The activity will result in a new impervious area on the site of more than 5,000m <sup>2</sup> , and/ or is not authorised by rules 5.5.1, 5.5.2, 5.5.3 or the TRP, and complies with the standards and terms of the rule	-	No	Yes	Discretionary	5.5.4	-
The activity results from urban development outside of urban areas* and is not authorised by rules 5.5.1, 5.5.2, 5.5.3, 5.5.4 or the TRP	-	No	No	Non-Complying	5.5.5	-

\*Where the activity is outside urban areas - the average ratio between total impervious area to lot area is less than six per cent (see PARP:ALW for further detail)



**1.0 SPECIALIST/AGENT DETAILS**

Company:	Watercare Services Ltd	Contact Person:	Belinda Petersen
Postal address of agent:	Private Bag 92 521, Wellesley Street, Auckland 1141 Postcode:		

**2.0 DESCRIPTION OF PROPOSAL**

2.1 Describe the proposed works in a separate report including, but not limited to, the following:

- Give the area in m<sup>2</sup> of proposed and existing impervious area on the site: *(refer definition of impervious in the PARP:ALW)*
- Give approximate construction date of existing impervious area, if known:
- State whether the area the development is located in is in the rural or urban area as defined in chapter 12 definitions of the PARP:ALW.
- State current District Plan zoning for the site and give the maximum impervious area allowed under this zoning.
- If any stormwater discharge points are located outside the development site, give the address/location for each property on which a discharge point is located.
- Give the name, address and legal description (Lot, DP, CT) of property owner(s) for each property on which a stormwater discharge point is located.

**Stormwater Discharge Points**

2.2 For Map reference use the New Zealand Transverse Mercator (NZTM) e.g. 1756730mE 5919740mN.

Use a geographic positioning system (GPS) device if possible to obtain a map reference accurate to 10m. The northing follows the easting. If you do not have a map reference, ensure that the location of your discharge point(s) are marked to an accuracy of 10m on your location plan. If you are unsure of the name of the water body, the Council will be able to help you.

2.3 Fill out the following table and provide in the report: Refer AEE Part A Sections 5 & 6 and Part B

	Discharge Point Name and/or Number		
Design Plan Reference.			
NZTM Map Reference of Discharge Point.			
Map Reference Source.			
Total Area Draining to Discharge Point (m).			
Impervious Area Draining to Discharge Point (m).			
Outfall Pipe Diameter or Channel Cross-section (mm).			
Nature of Receiving Environment. (onto land, into ground, river/lake, coastal (above CMA), coastal marine area, existing reticulated system).			
Name of stream or natural water body into which discharge will occur.			

Accept/ Reject	2.0 DESCRIPTION OF PROPOSAL contd		
	2.4	Development Type ( <i>tick one or more boxes</i> ):	<input type="checkbox"/> Residential Subdivision <input type="checkbox"/> Commercial Subdivision <input type="checkbox"/> Industrial Subdivision <input type="checkbox"/> Redevelopment <input type="checkbox"/> Rooding <input type="checkbox"/> Car Parking <input checked="" type="checkbox"/> Other ..Wastewater utility.....
	2.5	Land Use Catchment ( <i>tick one</i> ):	<input checked="" type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Rural <input type="checkbox"/> Rural/Residential <input type="checkbox"/> Residential/Commercial <input type="checkbox"/> Residential/Industrial <input type="checkbox"/> Commercial/Industrial <input type="checkbox"/> Mixed <input type="checkbox"/> Other .....
3.0 SITE PLAN			
	3.1	Show the following on the Site Plan: ( <i>provide one set of plans reduced to A3</i> )	
	<input checked="" type="checkbox"/>	Title Box including:	
	<input checked="" type="checkbox"/>	The name of the person and/or company that prepared the plans.	
	<input checked="" type="checkbox"/>	Address of property/site (adjacent to the location of the proposal in the CMA).	
	<input checked="" type="checkbox"/>	Date plans were drawn.	
	<input checked="" type="checkbox"/>	Unique plan reference or identification or variation number where relevant.	
	<input checked="" type="checkbox"/>	Legend explaining symbols on the Site Plan.	
	<input checked="" type="checkbox"/>	North point (orientated to the top of the page if possible).	
	<input checked="" type="checkbox"/>	Scale Bar.	
	<input checked="" type="checkbox"/>	Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).	
	<input checked="" type="checkbox"/>	Total site area in hectares or m <sup>2</sup> (if relevant).	
	<input checked="" type="checkbox"/>	Road frontages and names.	
	<input checked="" type="checkbox"/>	Property boundary dimensions – existing and future (where relevant).	
	<input type="checkbox"/>	Adjoining street numbers.	
	<input type="checkbox"/>	Catchment areas.	
	<input type="checkbox"/>	Steep slopes (>15°) highlighted.	
	<input checked="" type="checkbox"/>	Amount and location of existing and proposed impervious areas.	
	<input checked="" type="checkbox"/>	Existing and proposed ground cover.	
	<input checked="" type="checkbox"/>	Total and impervious contributing catchments for each stormwater management facility and discharge points on or off site.	
	<input checked="" type="checkbox"/>	Sub-catchment areas for both the existing and proposed site conditions.	
	<input checked="" type="checkbox"/>	Dedicated overland flow paths for storms exceeding normal site conveyance systems.	
	<input type="checkbox"/>	Directional stormwater flow arrows for all existing proposed channels, overland flow paths etc.	
	<input checked="" type="checkbox"/>	Existing and proposed stormwater discharge locations.	
	<input checked="" type="checkbox"/>	Location of existing stormwater reticulation.	
	<input checked="" type="checkbox"/>	Location of any natural heritage features e.g. indigenous vegetation and / or any significant ecological or geological features or features with significant natural heritage and / or conservation values e.g. volcanic cones, wetlands etc on the site and environs.	
	<input checked="" type="checkbox"/>	Location of any cultural heritage features including historic, waahi tapu and archaeological sites on the site and environs.	
	<input checked="" type="checkbox"/>	Flood plains / overland flow paths / stormwater outlets to kerb (5 years, 20 years and 100 years average recurrence interval (ARI) flood levels).	
	<input checked="" type="checkbox"/>	If the site is within or discharges to the Coastal Marine Area (CMA), the location of the Mean High Water Springs (MHWS).	
	<input checked="" type="checkbox"/>	Extent of any existing or proposed reserve area.	
	<input checked="" type="checkbox"/>	Location of any all wetlands, rivers or streams on the site and on neighbouring properties.	
	<input checked="" type="checkbox"/>	All proposed stormwater management facilities or mitigation measures.	
	<input type="checkbox"/>	Location of different soil types (NZ Geological Maps).	
	<input type="checkbox"/>	Location of all soil assessment bore holes/test pits.	
	<input checked="" type="checkbox"/>	Location of existing and proposed structures, roads, buildings, fences etc.	
	<input checked="" type="checkbox"/>	Location of existing and proposed underground services including public drains.	
	<input type="checkbox"/>	Existing and finished ground levels for either the whole site or the relevant work area. Show natural ground level datum points, contours and spot heights (to LINZ datum). Where appropriate, show contours to extend across boundaries.	
	<input type="checkbox"/>	Amounts and location of any earthworks - show volumes and areas of cut, fill and stockpiles (include staging details where relevant).	
Accept/ Reject	4.0 SITE LOCATION AND CHARACTERISTICS		
	4.1	Identify, describe and assess the existing site and environs including, but not limited to, the following:	
	<input checked="" type="checkbox"/>	The current nature of any waterbodies/watercourses or wetlands on the site or in proximity to the site (give distance from site).	

Discuss water colour and clarity, morphology, bank and bed material, stream width and depth and provide an ecological assessment of aquatic flora and fauna.

- Existing land cover – vegetation impervious areas etc. Detail the extent, type and maturity of existing vegetation.
- Extent of steep slopes (greater than 15 degrees) and effect on the proposed activity.
- Soils and geology information for the site (refer to New Zealand geological maps or soils reports).
- Current land use of site and adjacent land.
- Any cultural heritage features including historic, waahi tapu and archaeological sites on the site or environs and any investigation undertaken.

*The following may help you identify any cultural heritage features on your site:*

- *Check the Auckland Regional Cultural Heritage Inventory (CHI) for historic or cultural heritage information.*
- *The New Zealand Historic Places Trust has a register of historic places, archaeological sites, historic areas waahi tapu and waahi tapu areas.*
- *The Auckland Regional Plan: Coastal (ARP:C) schedules one and two contains a list of protected and preserved historic and cultural heritage sites.*
- *District Plans have schedules of protected cultural heritage items.*
- *Appendix B of the Auckland Regional Policy Statement (ARPS) contains a list of significant natural heritage values and identifies sites and areas of special value to Tāngata Whenua.*
- *Areas/places that are significant to Tāngata Whenua may only be identified during consultation.*

- Any natural heritage features e.g. indigenous vegetation and / or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands vegetation, etc on the site or environs and any investigation undertaken.

*The following may help you identify any natural heritage features on your site.*

- *Check the Natural Heritage Database (held by the Council) – ask Council staff.*
- *Appendix B of the Auckland Regional Policy Statement (ARPS) identifies areas of significant natural heritage values. Volume two of the Plan Maps for the Auckland Regional Plan Coastal Protection Areas, schedule three of the ARP:C describes their values.*
- *Schedule four of the ARP:C shows areas of significant conservation value as identified by the Ministry of Conservation.*
- *Plan change nine of the ARPS and schedule three of the ARP:C identify sites that have geological, landscape or coastal heritage value, including volcanic cones and coastal protection areas.*
- *Section 3.2 and 3.3 of chapter three of the PAPP:ALW provide a description and management approach for wetland management areas and natural lake management areas respectively.*
- *Schedule one of the PAPP:ALW identifies significant wetlands which constitute the wetland management areas. Information on the boundaries is available from the Council's Natural Heritage Information Database. The natural lake management area contains the identified lake and a 50m buffer strip around the lake.*
- *Section 3.4 of chapter three of the PAPP:ALW provides a description, criteria, and management approach for natural stream management areas.*
- *Maps series one of the PAPP:ALW identifies wetland and natural lake management areas, and also illustrates natural stream management areas in and indicative manner.*

- The immediate and ultimate receiving environments and wider catchment including ecological characteristics and sensitivity to adverse effects, vegetation cover and land use.
- Discussion of the potential and/or evidence of the site having contaminated land.
- Identification of the relevant catchments and relevant Catchment Management Plans or Integrated Catchment Management Plans etc.

## 5.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT

**5.1** Identify, describe and assess the actual and potential effects of the proposed activity on the environment including, but not limited to, the following:

- Flooding – increase in water flows on site, downstream and upstream if there are any backwater effects. Discuss details as per following specific design checklists.
- Water quality from contaminants and suspended solids. Discuss treatment and why a particular device is chosen and provide details as per following specific design checklists.
- Protection or enhancement of aquatic and/or riparian resources – In stream erosion, loss of habitat, change of nature of riparian margin. Discuss measures to maintain, provide fish passage, planting etc.
- Discuss potential for stormwater to be contaminated from present or past land use including contaminated soils?

## 5.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT contd

- Discuss the degree of consistency and integration with any Integrated Catchment Management Plan (ICMP) within the same catchment.
- Cultural heritage features including historic, waahi tapu and archaeological sites on the site or environs.
- Natural heritage features e.g. indigenous vegetation and / or any significant ecological or geological features with significant natural heritage and / or conservation values e.g. volcanic cones, wetlands vegetation, etc on the site or environs and any investigation undertaken.
- Discuss any adverse effects of the activity on any abstraction point for a registered drinking water supply as required by sections 6, 7 and 8 of the Resource Management (National Environmental Standards for sources of Human Drinking Water) Regulations 2007.
- Alternative Locations and Methods  
*As part of your AEE, it may be appropriate to consider if there are alternative methods of discharge, including discharge into any other receiving environment which may have lesser adverse effects.*  
*The level of detail required may depend on the scale of activity. Contact staff at the Council for advice on what sort of information you should provide.*
- Report describing consideration of alternatives attached (tick if relevant.)

## 6.0 PROPOSED MITIGATION

- 6.1** Discuss measures to be undertaken to avoid, remedy or mitigate adverse effects on the environment including, but not limited to, the following: refer AEE

## General Design Details and Stormwater Calculations Checklist

- In all cases complete below – General Design and Calculations Checklist.  
*Note: All calculations must be clear, detailed, logical and legible. Multiple re-productions of calculations easily become illegible and not acceptable. Electronic copies of any spreadsheets or models used are also required.*
- Provide a hydrologic / hydraulic analysis with reference to “Guidelines for stormwater runoff modelling in the Auckland region (TP 108)”.
- Provide drainage calculations, considering off-site contributing drainage. Provide pre and post development stormwater velocities and peak rates of discharge at all existing and proposed points of discharge for the 2 and 10 year, ARI storms. If there are documented flooding problems, calculations for the 100 year ARI event are required.
- Calculations with reference to TP108 for the water quality volume and 34.5mm should be done separately for pervious and impervious areas.
- If existing catchment studies show there is evidence of existing downstream flooding problems, provide profiles (long-sections and cross-sections) of channel invert and 100 year ARI flood levels to document the downstream or upstream backwater impact. (Note: The analysis should extend to a downstream control point such as a culvert where significant backwater with no overtopping occurs during the 100 year ARI storm).
- If no existing catchment information is available, provide details of investigations undertaken to ensure downstream flooding problems are not aggravated.
- Site conditions shown around points of all surface water discharges, including vegetation, method of flow conveyance from the site and design details for outfall structures.
- Outlet protection to be provided at all points of discharge from pipes, channels and spillways. Provide calculations, details, cross-sections and specifications, including d50 stone size, stone depth, outlet dimensions, and type of filter fabric.
- Filter fabric used to underlay all stone placed for stormwater erosion control purposed. Filter fabric specifications must be provided for various applications.
- Cross-section details provided for all outfall pipes and channels, drainage structures and facilities. Include inlet and outlet invert levels.
- Degree of consistency and integration with any approved ICMP, NMP or Structure plan.
- If the device is to be vested with the Council, the proposed design must be accompanied by written confirmation by the Council stating that they will take over the proposed stormwater system.

**7.0 SPECIAL DESIGN DETAILS**

*The following design checklists are based on "Stormwater Management Devices: Design Guidelines Manual" Technical Publication 10 (TP10 Second Edition, May 2003). Complete the checklists appropriate to devices proposed with the development. Discuss/provide details or demonstrate the following items:*

**7.1 Stormwater Pond Design Checklist**

*Appropriate to stormwater ponds and wetlands.*

- All ponds should be designed in accordance with or to meet the intent of TP108 and TP 10 chapter five.
- Water quality design storm computed with reference to the procedures and intent of TP108 and TP10 chapter three.
- Wetlands are preferred over deeper ponds for water quality and safety reasons (see TP10 chapter six).
- The volume of the sediment forebay is at least 15 per cent of the water quality volume.
- Pond side slopes are to be no steeper than 4H:1V and a gradual slope (15H:1V maximum) or shallow (0.3m deep) level section shall extend two metres from the pond's edge. Steeper slopes require specific approval.
- Safety and aquatic benches shall be provided adjacent to water surface.
- Emergency outlet is designed to pass the extreme flood or twice the 100 year ARI flow without scour or erosion. A minimum 0.3m freeboard above the critical duration 100 year ARI storm level is required.
- Off-line ponds preferred over on-line. (Note: If a pond is on-line, justification must be provided and a consent for activities in the bed of stream will also be required).
- Seepage control measures through the dam and adjacent pipes (for ponds having a normal pool of water or ponds designed to have water impounded against the embankment for greater than 24 hours).
- Anti-vortex device designed for the intake to the outlet structure.
- Trash rack provided to prevent clogging of pipes and outlet structure.
- Drain pipe for ponds with a permanent pool.
- Nominated disposal area for permanent pond sediments. For ponds treating predominantly residential areas, this could be a suitable sized land area, within the area draining directly to the pond.
- Landscape and planting plan.

**7.2 Infiltration Design Checklist**

*Appropriate to Infiltration Trenches and/or basins.*

- All infiltration devices should be designed in accordance with or to meet the intent of TP 108 and TP 10 chapter eight.
- Water quality design storm computed with reference to the procedures, and intent of TP108 and TP10 chapter three.
- Aquifer discharge location.
- Assessment of the aquifer mounding response to artificial recharge.
- Areas draining to these management practices shall be stabilised and filters established prior to runoff entering the facility to remove sediments which could cause premature clogging of the facility.
- A suspended solids filter accompanies the facility; when vegetative filters are used, there shall be at least a seven metre length of filter to minimise sediment entry into the infiltration facility.
- The infiltration practice is designed to drain completely within 48 hours.
- Infiltration practices overflow systems with measures to provide a non-erosive velocity of flow along its length and at the outfall.
- The slope of the bottom of the infiltration facility does not exceed five per cent.
- Infiltration practices not installed on or atop a slope whose natural incline exceeds 15 per cent.
- Allowance made for void space fraction of 0.35 in rock filled trenches when calculating required storage volume.
- Infiltration facilities not installed in fill material.
- Underground infiltration facilities have an observation well specified in their design to provide for maintenance inspections.

**8.0 SWALES OR VEGETATIVE FILTER STRIPS DESIGN CHECKLIST****8.1 Appropriate to swales or vegetative filter strips:**

- All swales or vegetative filter strips should be designed in accordance with or to meet the intent of TP108 and TP10 chapter nine.
- Water quality design storm computed with reference to the procedures and intent of TP108 and TP10 chapter three.
- Swales and vegetative filter strips designed with a minimum residence time of nine minutes.
- Swales not less than 30m in length.
- Longitudinal slope of swales is less than five per cent unless check dams are used to reduce erosion potential.
- Slope of filter strips less than five per cent.
- Planting details.

**8.2 Filtration Design Checklist***Appropriate to Sand Filters.*

- All sand filters designed in accordance with or to meet the intent of TP108 and TP10 chapter seven.
- Water quality design storm computed with reference to the procedures and intent of TP108 and TP10 chapter three.
- A minimum of 37 per cent of the water quality volume must be available as live storage. Use TP10 chapter seven to size the sand filtration chamber.
- The area of the sedimentation chamber is at least 25 per cent of the filtration area.
- Flow velocities in the sedimentation area maintained below 0.25 m/s.
- The sand grading is recommended to be within the following elements:

Sieve Size	Percentage Passing
9.5mm	100%
6.3mm	95-100%
3.17mm	80-100%
1,5mm	50-85%
0.8mm	25-60%
0.5mm	10-30%
0.25mm	2-10%

**8.3 Filtration Design Checklist***Appropriate to Rain Gardens.*

- All rain gardens should be designed in accordance with or to meet the intent of TP108 and TP10 chapter seven.
- Water quality design storm computed with reference to the procedures and intent of TP 108 and TP10 chapter three.
- A minimum of 40 per cent of the water quality volume must be available as live storage.
- Run-off from the water quality storm is filtered within one day for residential areas and one-and-a-half days for non-residential areas.
- The planting soil should conform to the following specifications:
  - Sandy loam, loamy sand, loam, or a loam/ sand mix (35-60 per cent).
  - Clay content should be less than 25 per cent.
  - Permeability should be at least 0.3m per day.
  - Free of stones, stumps, roots or other woody material over 25mm in diameter.
  - Free of brush or seed from noxious plants.
  - Placed in lifts of 300-400mm and loosely compacted (tamped lightly).
- A mulch layer should be included on the surface and should be:
  - Standard landscape type shredded wood mulch or chips.
  - Well aged and free of other materials such as weed seeds, soil, roots.
- Planting details in accordance with or to meet the intent of TP10.

**8.4 Rain Tanks Design Checklist**

*Appropriate to Rain Tanks used for Stormwater Management.*

- All rain tanks should be designed in accordance with or to meet the intent of TP108 and TP10 chapter three.
- Water quality design storm computed with reference to the procedures and intent of TP108 and TP10 chapter three.
- Required percentage run off determined and proportionate roof area to be treated by downstream devices determined using table 11-3 in TP10.
- Non-potable water demand is assessed.
- Roof catchment area does not exceed guidelines in TP10 (Partial re-use 150m2 or full water use 250 m2).

**8.5 Resource Protection / Minimisation of Site Disturbance Checklist**

*Site disturbance increases imperviousness and soil compaction which increases stormwater discharge. The removal of natural streams and their environs also limits the environments ability to cope with stormwater related impacts. Efforts to minimise site disturbance and/or enhance natural site features will assist to maintain existing quantities of stormwater discharge. Further information can be found in the publication TP124. Discuss the inclusion of the following measures:*

- Total site disturbance minimised.
- Protection of existing vegetation (bush / forest).
- Retention of streams in their natural form.
- Proposed planting of vegetation.
- Protection/ enhancement of riparian areas adjacent to stream, both continually and intermittently flowing.

**8.6 Oil and Water Separators**

- All oil and water separators shall be designed in accordance with or to meet the intent of TP10 chapter 10.
- The oil and water separator shall achieve or exceed the goal of removal of oil and grease down to 15mg/l.
- PI tanks and coalescing collection plate sizing shall be done with reference to / or meet the intent of Sections 10.5.2 and 10.5.3 of TP10.
- Proprietary brands such as SEPA, Baldwin Mpaks or Fluid-Tec shall meet manufacturers' specifications.

**8.7 Proprietary Devices**

- If the proposed stormwater management relies on a proprietary device details to demonstrate that the use of the proposed device meets the acceptance conditions from the Council for that device, must be provided.

**9.0 CONSULTATION**

Where consultation has taken place with lwi and/or any other interested person, details of the consultation undertaken, including the views of those consulted and your response to their concerns/issues must be provided. Copies of any correspondence confirming this consultation should be attached to this form.

**9.1 Describe and discuss the consultation undertaken (who was consulted and why?)**

See AEE Part A Section 8

**9.2 Describe and discuss the response from those consulted:**


**9.3 Describe your response to the views of those consulted?:**




## 10.0 MONITORING

Discuss if monitoring is required and how it will be carried out.

- Provide details of any proposed monitoring.
- Provide details of inspection, maintenance and records programme for erosion and sediment control measures.

# Application for a discharge permit to discharge contaminants into or onto land or water

Form B19

Office Use Only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

## To be used with the Auckland Transitional Regional Plan and the Proposed Auckland Regional Plan: Air, Land and WATER AND THE REGIONAL PLAN: Dairm Dairy Discharges only.

- Domestic Wastewater > 6m<sup>3</sup>/ day
- Non-Domestic (Commercial) Wastewater
- Application of Sewage Solids / Biosolids
- Sewage Network Discharges
- Discharge of Agrichemicals
- Discharge of Dairy Sludge or Washwater
- Discharges of Other Contaminants

**Form B10.1** is intended to provide a checklist of general information for all types of discharges which should be submitted as part of a complete AEE.

**Form B10.2** provides specific information requirements for each activity type. A report and supporting documentation must be provided which addresses, but is not necessarily limited to, the matters stated in the form.

### Discharges of contaminants - why is a resource consent required?

Section 15 of the Resource Management Act (1991) (RMA) provides for the regulation of the discharge of contaminants into the environment.

These activities may be subject to rules in both the Auckland Transitional Regional Plan 1991 (TRP) and the Proposed Auckland Regional Plan: Air, Land and Water (PARP:ALW). As the relevant provisions of the PARP:ALW are not yet operative the status of the activity is determined as the more restrictive of the relevant rules of both plans.

Chapters 5 and 4 A of the PARP:ALW contain objectives, policies and rules relating to the discharge of contaminants to land and water from a number of sources such as stormwater and wastewater networks, sewage treatment and disposal, sewage solids and fertiliser use. The Regional Plan: Farm Dairy Discharges outlines the rules relating to the management of the discharge of wash water from dairy farm. These discharges can have significant adverse environmental effects because the wastes are concentrated into small areas.

More information can be found in the Council's fact sheets.

#### ITP

Fact Sheet	Land and Water Pollution
Fact Sheet	Pollution Prevention Assessments

#### Wastewater

Fact Sheet	On-site Wastewater Management – Homeowners Guide
Fact Sheet	Maintenance and Trouble-shooting
Fact Sheet	One-off Consent Requirements

#### Rural

Fact Sheet	RC01 Dairy Permitted Activity
Fact Sheet	RC02 Dairy Controlled Activity
Fact Sheet	RC03 Dairy Discretionary Activity
Fact Sheet	RC05 Dairy effluent – Wash water vol. Reduction
Fact Sheet	RC06 Milk Disposal
Fact Sheet	RC13 Guidelines for Poultry Waste
Fact Sheet	Advice to Growers: Greenhouse Nutrient Solution Disposal
Fact Sheet	Offal Pit
Fact Sheet	Horses and Stable Waste
Fact Sheet	Agrichemical

P0117.3 08/07/10

Discharge Type	Discharge Source	Rules	Status of Activity (PARP:ALW)
Domestic Wastewater and Domestic Type Wastewater Discharges	Domestic Wastewater to existing deep bore disposal systems	5.5.26	Discretionary
	Domestic Wastewater > 6m/day	5.5.27	Discretionary
	Non-Domestic (Commercial) Wastewater		
	Discharge of Wastewater (Domestic or Domestic Type) to water		
Wastes from Production Land Activities	Discharges from Production Land Activities which do not meet rules 5.5.34 & 5.5.35.	5.5.36	Controlled
	Discharges from Production Land Activities which do not meet conditions, standards and terms of rules 5.5.34 - 5.5.36.	5.5.37	Discretionary
Sewage Solids/Biosolids	Application of Sewage Solids/Biosolids to land.	5.5.29/5.5.30	Controlled
	Application of Sewage Solids/Biosolids to land which does not meet standards and terms of 5.5.29/5.5.30 or application to food production or residential land.	5.5.31	Discretionary
Sewage Network Discharges (overflows)	From wastewater pumping stations via an overflow point that does not comply with rule 5.5.6.	5.5.7	Restricted Discretionary
	From wastewater via a pumping station or network overflow	5.5.10	Controlled
	From a wastewater pumping station or network overflow that does not comply with rule 5.5.10(v) or (vi)	5.5.11	Restricted Discretionary
	From a wastewater pumping station or network overflow that does not comply with rule 5.5.10(iii) or (iv)	5.5.12	Discretionary
	From a wastewater via a pumping station or network overflow outside of the urban area	5.5.13	Non-Complying
Other Discharges of Contaminants	Application of fertiliser onto land	5.5.39	Restricted Discretionary
	Wastewater/washwater from cleaning, maintenance and repair of structures; or, wastes from dry-abrasive blasting; or, discharge of geothermal water	5.5.63 -5.5.65	Controlled
	Geothermal water discharge from Parakai or Waiwera which does not comply with 5.5.65	5.5.66	Restricted Discretionary
	Geothermal water discharge from outside of Parakai or Waiwera Thermal Aquifer Management Areas	5.5.67	Discretionary
	Any other discharge not provided for in any other rule in chapter five	5.5.68	
Discharge of Agrichemicals	Discharge of agrichemicals in a manner that does not comply with rules 4A5.1 – 4A.5.4	4A5.5	Discretionary

## 1.0 SPECIALIST/AGENT DETAILS

Company:	Watercare Services Ltd	Contact Person:	Belinda Petersen
Postal address of agent:	Private Bay 92 521, Wellesley Street, Auckland Postcode: 1141		
Phone (day)	539 7477	Cellphone:	
		Fax:	
Email:	bpetersen@water.co.nz	Area of Expertise:	Resource Consents Manager

## 2.0 DESCRIPTION OF PROPOSAL

- 2.1 Describe the proposed works including, but not limited to, the following:
- Detailed description of the proposed works and purpose of the activity.
  - Background or history of the site including any expired and existing consents.

## 3.0 SITE PLAN

- 3.1 Show the following on the Site Plan: (provide one set of plans reduced to A3)
- Title Box including:
    - The name of the person and/or company that prepared the plans.
    - Address of property/site (adjacent to the location of the proposal in the CMA).
    - Date plans were drawn.
    - Unique plan reference or identification or variation number where relevant.
  - Legend explaining symbols on the Site Plan.
  - North point (*orientated to the top of the page if possible*).
  - Scale Bar.
  - Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).
  - Total site area in hectares or m<sup>2</sup> (*if relevant*).
  - Road frontages and names.
  - Property boundary dimensions – existing and future (*where relevant*).
  - Adjoining street numbers.
  - Location of any fill, semi-consolidated sediments or reclaimed land on the site.
  - Location of any cultural heritage features including historic, waahi tapu and Archaeological sites on the site and environs.
  - Location of any natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site and environs.
  - Disturbed Areas (*including staging details*).
  - Existing and proposed ground cover.
  - Location of the swimming pool backwash filter disposal system (*if relevant*).
  - Location of any bores (*actual and/or proposed*).
  - Location of water supply bores, water supply tanks and overflows.
  - Location of existing and proposed structures, roads, buildings, fences etc.
  - Location of existing and proposed underground services including public/private drains.
  - Location of vegetation existing vegetation and any proposed removal and planting including riparian etc.
  - Location of and distance to any "sensitive" neighbouring properties.
  - Historical location of structures that may have affected the distribution of contamination e.g. buildings, underground storage tanks, treatment path etc.
  - Direction of ground slope (*indicate with arrows*).
  - Location of each process listed in description of proposed activities.
- Stormwater Management**
- Amount and location of existing and proposed impervious areas.
  - Flood plains/overland flow paths/stormwater outlets to kerb (five years, 20 years and 100 years average recurrence interval (ARI) flood levels).

## 3.0 SITE PLAN contd

**Soil Information**

- Extent of any existing or proposed reserve disposal area.
- Location of all nearby bores, springs, wetlands, rivers or streams including those on neighbouring properties.
- Location of different soil types (NZ Geological Maps).
- Location of wastewater treatment and disposal systems - all components including:
  - Primary Disposal Field.
  - Reserve Disposal Field.
- Diversion Drains (stormwater, cut-off drains).
- Location of all soil assessment bore holes/test pits.
- System components including disposal field location or stream discharge point.
- The location of soil sampling points/trial pits.
- The lateral extent of the geological cross-section.
- Key pathways for contaminant migration and potential receiving environments (show with point, key title and scale).

**Separation Distance of Wastewater Disposal / Treatment Field from nearest:** Not applicable

- Boundaries.
- Habitable buildings.
- Embankments / retaining walls.
- Groundwater - wells, water bores, springs (on-site and neighbouring properties).
- Surface water (measure from edge of feature, not middle):
  - a) Roadside drains
  - b) Watercourses
  - c) Lakes and ponds
  - d) Coastal Marine Area
  - e) Mean High Water Spring
  - f) Wetlands
  - g) Others (*specify*) \_\_\_\_\_

## 4.0 SITE LOCATION AND CHARACTERISTICS

Identify, describe and assess the existing site and environs including, but not limited to, the following:

**4.1 Tick Catchment below:**

- Is the activity upstream/up gradient of an abstraction point for a registered drinking water supply that provides no fewer than 501 people with drinking water for not less than 60 days each year?

 Yes No**4.2 Tick Catchment below:**

- Hoteo River upstream of Wilson Road (Wellsford )
- Maharangi River (Warkworth)      None of these are applicable
- Ohirangi Stream (Helensville)
- Mangakura Stream (Helensville)

**4.3 Those parts of the following rivers and their tributaries above their respective water supply dams (Watercare Services Ltd):** Not applicable

- |  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> Waitakere River | <input type="checkbox"/> Nihotupu River | <input type="checkbox"/> Huia River         | <input type="checkbox"/> Hays Creek River |
| <input type="checkbox"/> Cosseys River   | <input type="checkbox"/> Wairoa River   | <input type="checkbox"/> Mangatawhiri River | <input type="checkbox"/> Mangatangi River |

These catchments are all illustrated in the Auckland Regional Policy Statement 1999 Map 5 sheets 1 – 2. "Water Quality - Degraded and Susceptible Areas".

**4.4 Tick Aquifer below:** Not applicable

- |   |  |
|---|--|
| <input type="checkbox"/> Onehunga Mt Wellington Volcanic (Watercare Services Ltd) | <input type="checkbox"/> Bombay Franklin Volcanic    |
| <input type="checkbox"/> Pukekohe Franklin Volcanic                               | <input type="checkbox"/> Glenbrook Franklin Volcanic |

## 4.0 SITE LOCATION AND CHARACTERISTICS contd

These aquifers are all illustrated in the Proposed Auckland Regional Plan: Air, Land and Water Map series 2, map 9 and 17 – 19 "Aquifer Management Areas".

*If your activity is in one of the catchments of aquifers previously named, then the "Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 may affect your application. You should contact Council staff for advice.*

- Site topography/slope
- Existing vegetation – extent, type, maturity
- Current land use on the site, in the vicinity and within the wider catchments.
- The current nature of any waterbodies/watercourses on the site or in proximity to the site (Give distance from site). Discuss water colour and clarity, morphology, bank and bed material stream width and depth and provide an ecological assessment of aquatic flora and fauna.
- Existing treatment and disposal systems on site or on surrounding land and their performance
- Special Management Area(s). (Refer chapter three, PARP:ALW)
- Any cultural heritage features including historic, waahi tapu and Archaeological sites on the site or environs and any investigation undertaken.

*The following may help you identify any cultural heritage features on your site:*

- *Check the Auckland Regional Cultural Heritage Inventory (CHI) for historic or cultural heritage information.*
- *The New Zealand Historic Places Trust has a register of historic places, Archaeological sites, historic areas waahi tapu and waahi tapu areas.*
- *The Auckland Regional Plan: Coastal (ARP:C) schedules one and two contains a list of protected and preserved historic and cultural heritage sites.*
- *District Plans have schedules of protected cultural heritage items.*
- *Appendix B of the Auckland Regional Policy Statement (ARPS) contains a list of significant natural heritage values and identifies sites and areas of special value to Tāngata Whenua.*

*Areas/places that are significant to Tāngata Whenua may only be identified during consultation.*

- Describe any natural heritage features e.g. indigenous vegetation and / or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site or environs and any investigation undertaken.

*The following may help you identify any natural heritage features on your site.*

- *Check the Natural Heritage Database (held by the Council) – ask Council staff.*
- *Appendix B of the Auckland Regional Policy Statement (ARPS) identifies areas of significant natural heritage values. Volume two of the Plan Maps for the Auckland Regional Plan Coastal Protection Areas, schedule three of the ARP:C describes their values.*
- *Schedule four of the ARP:C shows areas of significant conservation value as identified by the Ministry of Conservation.*
- *Plan change nine of the ARPS and schedule three of the ARP:C identify sites that have geological, landscape or coastal heritage value, including volcanic cones and coastal protection areas.*
- *Section 3.2 and 3.3 of chapter three of the PARP:ALW provide a description and management approach for wetland management areas and natural lake management areas respectively.*
- *Schedule one of the PARP:ALW identifies significant wetlands which constitute the wetland management areas. Information on the boundaries is available from the Council's Natural Heritage Information Database. The natural lake management area contains the identified lake and a 50m buffer strip around the lake.*
- *Section 3.4 of chapter three of the PARP:ALW provides a description, criteria, and management approach for natural stream management areas.*
- *Maps series one of the PARP:ALW identifies wetland and natural lake management areas, and also illustrates natural stream management areas in an indicative manner.*

- The immediate and ultimate environments and wider catchment including ecological characteristics and sensitivity to adverse effects, vegetation cover and land use.
- Location of the discharge in relation to registered drinking water supply abstraction points.

**5.0 PROPOSED CATCHMENT TREATMENT**

- Treatment system design (include design drawings).
- Treatment process (include process flow diagram).
- Expected treated effluent quality.
- System component locations (include site plan).
- Management and maintenance requirements.
- Alternate treatment options.

**6.0 ACTUAL AND POTENTIAL EFFECTS OF THE PROPOSED ACTIVITY ON THE ENVIRONMENT AND PROPOSED MITIGATION**

Identify and assess the actual and potential effects of the proposed activity on the environment including, but not limited to, the following:

**6.1 Discharge to Land**

- Geological assessment (slope stability) etc.
- Bore logs and discussion of soil profiles, drainage characteristics, groundwater depths and limiting horizons.
- Discharge field location including reserve area.
- Separation distances to potential receiving environments.
- Assessment of the sensitivity of the receiving environment(s) and effects on receiving environment(s) i.e. soils, surface waters and groundwater.
- Details of easement(s)/covenant(s) required for the discharge and/or relevant supporting documentation e.g. heads of agreement (where relevant).
- Any possible alternative methods of discharge including discharge into any other receiving environment.
- Assessment of odour issues.
- Assessment of adverse effects to public health.
- Amenity and resource values.
- Cultural heritage features including historic, waahi tapu and Archaeological sites, on the site or environs.
- Natural heritage features e.g. indigenous vegetation and or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc.
- Effects on any abstraction point for a registered drinking water supply as required by sections 6, 7 and 8 of the Resource Management (National Environment Standards for sources of Human Drinking Water) Regulations 2007. For more detail on catchments and aquifers refer to Form B18 "Discharge less than or equal to 6m<sup>3</sup>/day of Domestic wastewater onto or into Land".
- Effects on any abstraction point for a registered drinking water supply

**6.2 Discharge to Water**

- Waterbody/stream hydrography.
- Discharge regime (e.g. diurnal, daily, yearly).
- Discharge quality analysis, including key contaminant levels and thermal analysis.
- Determination of Environmental Index in accordance with TP302 (Stream Ecological Valuation (SEV)).
- Consideration of effluent dispersion and effect persistence.
- Assessment for discharge to result in a change to receiving water colour, clarity, chemical composition, temperature.
- Assessment of the effects on the receiving environment and sensitivity of the receiving environment to adverse effects (water quality assessment from a water quality scientist). Note: If the discharge is to the CMA you will require a Coastal Permit (use form B23).
- Any possible alternative methods of discharge, including discharge into any other receiving environment.
- Assessment of odour issues.
- Assessment of adverse effects to public health.
- Amenity and resource values.
- Cultural heritage features including historic, waahi tapu and Archaeological sites on the site or environs.
- Natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands vegetation, etc on the site or environs.



**6.0 ACTUAL AND POTENTIAL EFFECTS OF THE PROPOSED ACTIVITY ON THE ENVIRONMENT AND PROPOSED MITIGATION contd**

- Effects on any abstraction point for a registered drinking water supply as required by sections 6, 7 and 8 of the Resource Management (National Environment Standards for sources of Human Drinking Water) Regulations 2007. For more detail on catchments and aquifers refer to Form B18 "Discharge less than or equal to 6m<sup>3</sup>/day of Domestic wastewater onto or into Land".

**7.0 PROPOSED MONITORING**

- 7.1 Discuss measures to be undertaken to avoid, remedy or mitigate identified adverse effects on the environment.

**8.0 MONITORING**

Discuss if monitoring is required and how it will be carried out.

- 8.1 Provide details of the monitoring and maintenance requirements including, but not limited to, the following:  
*(Note: A maintenance agreement is mandatory)*

- 8.1.1 Pump out frequency.


- 8.1.2 Treated wastewater quality monitoring.


- 8.1.3 Discharge flow monitoring.


**9.0 CONSULTATION**

Where consultation has taken place with lwi and/or any other interested person, details of the consultation undertaken, including the views of those consulted and your response to their concerns/issues must be provided. Copies of any correspondence confirming this consultation should be attached to this form.

- 9.1 Describe and discuss the consultation undertaken (who was consulted and why?):

See Section 8 AEE Part A

Accept/  
Reject

## 9.0 CONSULTATION contd

9.2 Describe and discuss the response from those consulted:


9.3 Describe your response to the views of those consulted:


## FORM B – SPECIFIC INFORMATION

N.B. if the discharge is to the CMA you will require a Coastal Permit – Use form B14

**Answer the following and/or discuss the following items in your AEE report**

Where relevant, place a tick ✓ in the box if the item applies and has been provided in the report.

Accept/ Reject	B1.0 DOMESTIC OR DOMESTIC TYPE (COMMERCIAL) WASTEWATER (RULES 5.5.26 & 5.5.27)
NA	<ul style="list-style-type: none"> <li><input type="checkbox"/> Details of why wastewater disposal on the site does not comply with the PARP:ALW permitted or controlled activity requirements for the on-site disposal of domestic wastewater.</li> <li><input type="checkbox"/> Floor plans of the proposed facility.</li> <li><input type="checkbox"/> The maximum number of people likely to use the premises and specification of the number of bedrooms (including potential bedrooms, if applicable). (Refer TP58 Table 6.1).</li> <li><input type="checkbox"/> Justification of design flow allowance with reference to TP58 Table 6.2 and specific details of any water use reduction fixtures proposed. (Refer TP58 section 6.3.2 &amp; Table 6.2 &amp; 6.3).</li> <li><input type="checkbox"/> Hydraulic (areal/basal) application rates and comparison with TP58 criteria for the specific site conditions and design calculations.</li> </ul>
B2.0 WASTES FROM PRODUCTION LAND ACTIVITIES (RULES 5.5.36 & 5.5.37)	
NA	<ul style="list-style-type: none"> <li><input type="checkbox"/> Details of why the proposed activity does not comply with the PARP:ALW permitted activity rules 5.5.34 and 5.5.35.</li> <li><input type="checkbox"/> Discharge nutrients waste analysis or industry standard.</li> <li><input type="checkbox"/> Discharge frequency (e.g. daily, seasonal) with reference to crop cycles, harvesting cycles, seasonal production activities, washing cycles etc.</li> <li><input type="checkbox"/> Specifications and details of any collection, treatment and disposal systems proposed, including specifications of application/irrigation pump(s), specifications of irrigator application rates/travelling rates, irrigation application rates (mm) and nitrogen application rate (hectare/year).</li> <li><input type="checkbox"/> Proposed monitoring and maintenance schedule - including but not limited to routine daily and long term system maintenance records, routine soil analysis, routine wastewater analysis, flow meter records, washing cycles records, details of cut/carry system including quantities removed and paddock production survey, water quality sampling/monitoring for area around disposal area.</li> <li><input type="checkbox"/> A flowchart showing the management process from collection system to disposal area.</li> <li><input type="checkbox"/> Irrigation plan (showing area (hectare), hydrants/trunk lines, and paddock rotations). Nitrogen loading rates calculated for each area (hectare).</li> </ul>
B3.0 APPLICATION OF SEWAGE SOLIDS/BIOSOLIDS (5.5.29 & 5.5.31)	
NA	<ul style="list-style-type: none"> <li><input type="checkbox"/> Description of source of sewage solids/biosolids.</li> <li><input type="checkbox"/> Description of stabilisation process and analysis of sewage solid/biosolid stabilisation grade.</li> <li><input type="checkbox"/> Consideration against PARP:ALW rule 5.5.29 in the first instance and with reference to Ministry for the Environment guidelines (Guidelines for the Safe Application of Biosolids to Land, August 2003).</li> <li><input type="checkbox"/> Analysis of sewage solid/biosolid contaminant levels and composition.</li> <li><input type="checkbox"/> Soil analysis.</li> <li><input type="checkbox"/> Description of storage and disposal method, including nutrient loading rates.</li> <li><input type="checkbox"/> Identification of transport routes.</li> <li><input type="checkbox"/> Management and monitoring plan, record-keeping and reporting requirements.</li> <li><input type="checkbox"/> Discussion if relevant of requirements of the PARP:ALW rule 4.5.69 – Air Quality.</li> </ul>
B4.0 SEWAGE NETWORK DISCHARGES(RULES 5.5.57 – 5.5.13)	
NA	<ul style="list-style-type: none"> <li><input type="checkbox"/> Identification of all overflow points.</li> <li><input type="checkbox"/> Detail of key design bases, including number of overflows/year, rain event modelling etc.</li> <li><input type="checkbox"/> Assessment against relevant Integrated Catchment Management Plan or Network Management Plan.</li> <li><input type="checkbox"/> Design and construction standards.</li> <li><input type="checkbox"/> Identification of sensitive environmental areas and receiving environments - Note: If the discharge is to the CMA you will require a Coastal Permit (use form B14).</li> <li><input type="checkbox"/> Assessment of best practical option(s) for the proposed discharge.</li> </ul>

Accept/ Reject	<b>B5.0 OTHER DISCHARGES OF CONTAMINANTS (RULES 5.5.63 – 5.5.68)</b>	
	<input checked="" type="checkbox"/>	Details of why the proposed activity does not comply with PARP:ALW permitted activity rules 5.5.54 and 5.5.62.
<b>B6.0 DISCHARGE OF AGRICHEMICALS(RULES 4A 5.5 )</b>		
NA	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Description of organism to be eradicated, status of organism and methods for eradication. Copy of Spray Plan. Copy of any public notices and description of methods to warn/exclude public from operations areas as detailed in rule 4A.5.4(f) general notification. Analysis of toxicity, persistence, potential for bioaccumulation and effects on non-target organisms. Material safety data sheet for any agrichemicals to be used. Assessment of any chemicals to be used and copies of any permits issued. Detailed description of agrichemical concentration and application procedure with reference to manufacture recommended usage concentrations and procedures and best practice guidelines. Assessment of potential for application of agrichemicals to effect drinking water, public health, surface waters, CMA and groundwater. Details of the minimum qualifications to be held by any contractors i.e. Grosafe Certificate. Details of why the proposed activity does not comply with the permitted activity rules of chapter four A of the PARP:ALW.
<b>B7.0 DAIRY DISCHARGE</b>		
NA	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Details of why the proposed activity is not a permitted activity under the Regional Plan: Farm Dairy Discharges. Maximum number of cows milked. Pond site and construction including materials use, batters and pipe works, design size, depth, fencing, vegetation clearance. Details of yard management and clean water diversion. Separation distances from water bodies and CMA recreational water users and groundwater (bores). Details of the pond de-sludging frequency and land application management. Contingency measures in the event of system failure/alternative disposal means.

# Application for a discharge permit to discharge contaminants into air.



Form B20

Office Use Only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

**To be used with the Auckland Transitional Regional Plan and the Proposed Auckland Regional Plan: Air, Land and Water.**

## Discharge of contaminants to air - why is a resource consent needed?

Section 15 of the Resource Management Act 1991, (RMA) provides for the regulation of the discharge of contaminants into air.

Chapter four of the Proposed Auckland Regional Plan: Air, Land and Water (PARP:ALW), provides for the discharge of contaminants into air and addresses activities that have a significant actual or potential adverse effect on air quality. The air quality provisions set out in chapter four apply to the entire Auckland region, including the Coastal Marine Area (CMA) and deal with the discharge of contaminants into air from any type of activity including:

- Mobile sources
- Domestic fires
- Outdoor burning
- Combustion activities
- Incineration and cremation
- Dust generating activities
- Waste processes e.g. sewage solids, refuse transfer, landfills
- Food and animal or plant processes e.g. fermentation, milling, refining, roasting, rendering
- Chemical processes e.g. solvents, distillation, organic chemicals extraction, ventilation, displacement, displacing fuels
- Metallurgical processes
- Production land activities and intensive livestock farming

There are four Air Quality Management Areas within the Auckland region - industrial, urban, rural and coastal. A description and management approach of the areas are found in sections 3.10 – 3.13 of the PARP:ALW and they are identified on the PARP:ALW maps except for the Coastal Air Quality Management Areas, which only apply within the Coastal Management Area. Air quality targets that apply to the Air Quality Management Areas are found in Table 4.2 of the PARP:ALW. More information concerning air discharges can be found in the AC's fact sheets.

Airfacts Sheet 1	General Intro - The Air We Breathe
Airfacts Sheet 2	Pollutants
Airfacts Sheet 3	AQ Monitoring Network
Airfacts Sheet 4	State of the Region's Air Quality
Airfacts Sheet 5	Health Effects
Airfacts Sheet 6	Auckland Air Emissions Inventory
Airfacts Sheet 7	Air Quality Standards and Targets
Airfacts Sheet 9	How to operate Woodburners and Domestic Fires
Airfacts Sheet 10	Rules for Domestic Fires and Woodburners
Airfacts Sheet 12	Industry
Airfacts Sheet 14	Outdoor Burning
Airfacts Sheet 15	Transport

## 1.0 SPECIALIST/AGENT DETAILS

Company:	Watercare Services Ltd	Contact Person:	Belinda Petersen
Postal address of agent:	Private Bag 92 521, Wellesley Street, Auckland 1141 Postcode: 1141		
Phone (day)	539 7477	Cellphone	
		Fax:	
Email:	bpetersen@water.co.nz	Area of Expertise:	Resource Consents Manager

## 2.0 DESCRIPTION OF PROPOSAL

- Description of the proposed activity that either results in a discharge into air or could potentially result in a discharge into air.
- State the Air Quality Management Area of the site where the discharge into air is occurring. Table 9.2 AEE
- A list of all the contaminants discharged into air by the proposed activity and the expected maximum concentrations of these contaminants.  
(refer to schedule seven of the PARP:ALW for a list of hazardous air pollutants)
- The frequency of the discharge, or the hours of operation (whichever is most appropriate).
- The quantity, quality and type of discharge.
- The methods of discharge.
- The expected/requested duration of the consent and reasons for that.
- Alternatives – if relevant describe any alternative methods of disposal or discharge that have been considered for the site, including discharge into any other receiving environment.
- If the application is for renewal of consent, ensure that the application includes: Not applicable
- A copy of the current consent.
- Any changes that have been made to the existing plant since the previous application was granted.
- Description of any changes to the receiving environment, including changes to the zoning of the area or any new sensitive activities (e.g. residential, childcare).
- The annual mass emission of PM<sub>10</sub> and NO<sub>2</sub> for the previous five years (if applicable) and how these impact on the Air Quality National Environmental Standards.
- If any dispersion modelling of emissions from the proposed activity has been undertaken, ensure that: Not applicable
- Name of the software used is provided.
- Description of the method used is provided.
- The results are provided in full.

## 3.0 SITE PLAN

- 3.1 Show the following on the Site Plan: (provide one set of plans reduced to A3)
- Title Box including:
- The name of the person and/or company that prepared the plans.
  - Address of property.
  - Date plans were drawn.
  - Unique plan reference or identification or variation number where relevant.
- Legend explaining symbols on the Site Plan.
- North point (orientated to the top of the page if possible).
- Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).
- Scale Bar.
- Total site area in hectares or m<sup>2</sup>.
- Property boundary dimensions – existing and future (where relevant).
- Adjoining street numbers.
- Location of existing and proposed structures, roads, buildings, fences etc.

**3.0 SITE PLAN CONTINUED**

- Location of each process listed in description of proposed activities.
- Discharge points.
- Location of and distance to any "sensitive" neighbours e.g. residential.
- High Risk areas and activities.
- Location of any cultural heritage features including historic, waahi tapu, and Archaeological sites on the site and environs. (Refer to section 3.3 of this form).
- Location of any natural heritage feature e.g. indigenous vegetation and/or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site and environs. (Refer to section 3.4 of this form).

**4.0 SITE LOCATION AND CHARACTERISTICS**

- 4.1 Identify, describe and assess the existing site and environs including, but not limited to, the following:
- The location of the discharge points in relation to the operation and site boundaries.
  - The receiving environment including ecological characteristics and its sensitivity to the particular discharge.
  - Any cultural heritage features including historic, waahi tapu and Archaeological sites on the site or environs and any investigation undertaken.
  - The following may help you identify any cultural heritage features on your site:
    - Check the Auckland Regional Cultural Heritage Inventory (CHI) for historic or cultural heritage information.
    - The New Zealand Historic Places Trust has a register of historic places, Archaeological sites, historic areas waahi tapu and waahi tapu areas.
    - The Auckland Regional Plan: Coastal (ARP:C) schedules one and two contains a list of protected and preserved historic and cultural heritage sites.
    - District Plans have schedules of protected cultural heritage items.
    - Appendix B of the Auckland Regional Policy Statement (ARPS) contains a list of significant natural heritage values and identifies sites and areas of special value to Tāngata Whenua.
  - Areas/places that are significant to Tāngata Whenua may only be identified during consultation.
  - Any natural heritage features e.g. indigenous vegetation or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site or environs and any investigation undertaken.
 

The following may help you identify any natural heritage features on your site:

    - Check the Natural Heritage Database (held by the Council) – ask Council staff.
    - Appendix B of the Auckland Regional Policy Statement (ARPS) identifies areas of significant natural heritage values. Volume two of the Plan Maps for the Auckland Regional Plan Coastal Protection Areas, schedule three of the ARP:C describes their values.
    - Schedule four of the ARP:C shows areas of significant conservation value as identified by the Ministry of Conservation.
    - Plan change nine of the ARPS and schedule three of the ARP:C identify sites that have geological, landscape or coastal heritage value, including volcanic cones and coastal protection areas.
    - Section 3.2 and 3.3 of chapter three of the PARP:ALW provide a description and management approach for wetland management areas and natural lake management areas respectively.
    - Schedule one of the PARP:ALW identifies significant wetlands which constitute the wetland management areas. Information on the boundaries is available from the Council's Natural Heritage Information Database. The natural lake management area contains the identified lake and a 50m buffer strip around the lake.
    - Section 3.4 of chapter three of the PARP:ALW provides a description, criteria, and management approach for natural stream management areas.
    - Maps series one of the PARP:ALW identifies wetland and natural lake management areas, and also illustrates natural stream management areas in and indicative manner.

**5.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT**

- 5.1 Identify, describe and assess the actual or potential effects on the environment of the proposed activity including, but not limited to, the following:
- Any effects arising from the quantity, quality and type of discharge.
  - Any effects arising from the method of discharge.
  - Effects on any cultural heritage features including historic, waahi tapu and Archaeological sites.
  - Effects on any natural heritage features e.g. indigenous vegetation or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site or environs.
  - Where the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment which are likely to arise as a result of discharges into air from such use.



Accept/ Reject	6.0 PROPOSED MITIGATION
	<p>6.1 Discuss measures to be undertaken to minimise the discharge and to avoid, remedy or mitigate adverse effects of the discharge including, but not limited to, the following:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Adequacy of the control measures for the collection, containment, management and treatment of the discharge.</li> <li><input checked="" type="checkbox"/> Type and adequacy of control treatment.</li> </ul> <p>Give details of all emissions control equipment, including:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Type of emissions control equipment (Electro-static precipitator, baghouse, wet scrubber, ESP).</li> <li><input checked="" type="checkbox"/> Location of equipment.</li> <li><input type="checkbox"/> Manufacturer and model number.</li> <li><input type="checkbox"/> Date of installation.</li> <li><input type="checkbox"/> The maintenance and inspections that are routinely carried out on the equipment.</li> <li><input checked="" type="checkbox"/> Provide an Air Quality Management Plan (AQMP). This may be appropriate depending on the scale and complexity of operations. This may form part of an Environmental Management Plan and may include existing standard operation procedures.</li> </ul>
<b>8.0 MONITORING</b>	
	<p>Discuss if monitoring is required and how it will be carried out.</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Details of the monitoring, including a description of method. Refer AEE Part A Section 5.4</li> <li><input checked="" type="checkbox"/> Frequency of monitoring.</li> <li><input type="checkbox"/> Location of monitoring equipment.</li> <li><input type="checkbox"/> Brand and type of flow or contaminant monitors.</li> <li><input type="checkbox"/> Provide results of any monitoring carried out to date.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Industry Groups and Specific Activity Types</b></p> <p>Some specific industry groups that will require further detailed information are listed below, together with the specific information that may be required in the application. The rules of the PARP:ALW that are relevant to these particular industry groups are also listed. Please ensure that in addition to Q1-Q8, the specific requirements for your industry group are provided in the application.</p> </div>
<b>9.0 COMBUSTION ACTIVITIES (RULES 4.5.24 – 4.5.31)</b>	
NA	<ul style="list-style-type: none"> <li>• Description of the combustion processes including details of the boiler or heat unit, type of fuel and the heat release rate (kilowatts, megawatts).</li> <li>• The height of the discharge point (chimney/flue) and a description of any fitting on top of the chimney.</li> <li>• The expected discharge velocity of the flue gas.</li> <li>• An assessment of the condition of the boiler, heat unit and discharge point and details of their last service.</li> </ul>
<b>10.0 INCINERATION AND CREMATION (RULES 4.5.32-4.5.35)</b>	
NA	<ul style="list-style-type: none"> <li>• Information regarding the material to be burned including any chemicals contained in the material or treatments that the material has undergone.</li> <li>• Information regarding the components of the gas if the proposed activity involves flaring of gaseous products.</li> <li>• Information regarding the afterburner, including the operation temperature, residence time and oxygen levels.</li> <li>• The height of the discharge point (chimney/flue) and a description of any fitting on top of the chimney/flue.</li> <li>• The expected discharge velocity of the flue gas.</li> </ul>
<b>11.0 DRYING AND KILN PROCESSES (RULES 4.5.36-4.5.42)</b>	
NA	<p>11.1 Including printing or coating processes and manufacture of synthetic wood or paper board.</p> <ul style="list-style-type: none"> <li>• The height of the discharge point (chimney/flue) and a description of any fitting on top of the chimney.</li> <li>• A list of any chemicals used in the process.</li> <li>• Maximum hourly and annual consumption of chemicals.</li> <li>• The expected discharge velocity of the flue gas.</li> </ul>
<b>12.0 DUST GENERATING ACTIVITIES (RULES 4.5.43-4.5.67)</b>	
NA	<p>12.1 Quarrying Activities</p> <ul style="list-style-type: none"> <li>• Description of the type of rock being quarried.</li> <li>• The open-cast extraction capacity (tonnes/hour).</li> <li>• The size reduction and screening capacity (tonnes/hour).</li> </ul>

Accept/ Reject	12.0 DUST GENERATING ACTIVITIES (RULES 4.5.43-4.5.67) CONTINUED
	<ul style="list-style-type: none"> <li>• The storage capacity (tonnes).</li> <li>• The dust control measures that will be undertaken.</li> <li>• Details of the transportation methods undertaken onsite.</li> </ul> <p>12.2 Abrasive Blasting – non-mobile operators</p> <ul style="list-style-type: none"> <li>• Description of the process must include details of the blasting chamber and blasting media used including the percentage of free silica by weight.</li> <li>• The emissions control equipment should include details of filtration and collection equipment.</li> <li>• The expected discharge velocity of the flue gas.</li> </ul> <p>12.3 Asphalt Production</p> <ul style="list-style-type: none"> <li>• The height of each discharge point (chimney/flue) and a description of any fitting on top of the chimney.</li> <li>• The hourly production capacity.</li> <li>• Any odours that are likely to result from the process and the measures that will be taken to mitigate the effects of these odours.</li> <li>• The expected discharge velocity of the flue gas.</li> </ul>
<b>13.0 WASTE PROCESSES (RULES 4.5.68-4.5.86)</b>	
NA	<p>13.1 This additional information applies only to facilities for hazardous waste treatment.</p> <ul style="list-style-type: none"> <li>• Description of the type of waste to be handled or treated on site including an assessment of the possible hazardous nature of the waste.</li> <li>• Any odours that are likely to result from the process and the measures that will be taken to mitigate the effects of these odours.</li> <li>• The expected discharge velocity of the flue gas (if applicable).</li> </ul>
<b>14.0 FOOD AND ANIMAL OR PLANT MATTER PROCESSES (RULES 4.5.87-4.5.90)</b>	
NA	<p>14.1 Milling, frying, curing, roasting or refining processes/wool scourers and tanneries/rendering.</p> <ul style="list-style-type: none"> <li>• The height of each discharge point (chimney/flue) and a description of any fitting on top of the chimney/flue.</li> <li>• Any odours that are likely to result from the process and the measures that will be taken to mitigate the effects of these odours.</li> <li>• The expected discharge velocity of the flue gas.</li> </ul>
<b>15.0 CHEMICAL PROCESSES (RULES 4.5.91-4.5.96)</b>	
NA	<ul style="list-style-type: none"> <li>• Any hazardous air pollutants that will be emitted in accordance with schedule seven of the PARP:ALW.</li> <li>• The height of each discharge point (chimney) and a description of any fitting on top of the chimney.</li> <li>• The expected discharge velocity of the flue gas.</li> <li>• Particulate emissions testing results.</li> <li>• The storage capacity of chemicals including an estimate of the mass of volatile organic compounds that are discharged to air (if applicable).</li> <li>• The production rate (if applicable).</li> </ul>
<b>16.0 METALLURGICAL PROCESSES (RULES 4.5.97-4.5.107)</b>	
NA	<ul style="list-style-type: none"> <li>• The estimated production rate.</li> <li>• The height of the discharge point (chimney/flue) and a description of the fitting on top of the chimney/flue.</li> <li>• The expected discharge velocity of the flue gas.</li> </ul>
<b>17.0 INTENSIVE LIVESTOCK FARMING (RULES 4.5.108-4.5.113)</b>	
NA	<ul style="list-style-type: none"> <li>• Description of the process including an estimate of the number of livestock that will be housed on the site.</li> <li>• Any odours that are likely to result from the process and the measures that will be taken to mitigate the effects of these odours.</li> </ul>

# Application for discharge permit remediation, disturbance management and discharge from contaminated land



Form B22

Office Use Only

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

## Contaminated sites – why is a resource consent required?

- Section 15 of the Resource Management Act (1991) (RMA) provides for the regulation of discharges from contaminated land.
- If your application is to authorise a long-term passive discharge of contaminants from a site without remediation and/or disturbance activity, you need to ensure your application addresses all of the items listed in Forms B13.1 and B13.2.
- If your application is to authorise remediation and/or disturbance activities at a contaminated site and a long-term passive discharge consent may still be required for the site following the works, please ensure your application addresses all of the items listed in Forms B13.1, B13.2 and B13.3.
- If your application is to authorise remediation and/or disturbance activities at a contaminated site consent only, please ensure your application addresses all items listed in Form B13.1 and B13.3.

The activity may be subject to rules in both the Auckland Transitional Regional Plan 1991 (TRP) and the Proposed Auckland Regional Plan: Air, Land and Water (PARP:ALW). As the relevant provisions of the PARP:ALW are not yet operative the status of the activity is determined as the more restrictive of the relevant rules of both plans.

Chapter 5.0 of the PARP:ALW contains objectives, policies and rules relating to the remediation, disturbance, management and discharge from contaminated land.

P0120.3 08/07/10

## REPORTING FORMAT FOR CONTAMINATED SITES

The standard practice for reporting on contaminated sites is generally in the following sequence:

1. Preliminary Site Investigation Report (or PSI) (desk top study).
2. Site Investigation Report (or SIR) (including intrusive site sampling).
3. Remedial Action Plan (or RAP).
4. Site Validation Report (or SVR).
5. Monitoring and Management Plan (or MMP).

Steps one (PSI) and two (SIR) of the sequence may occasionally be combined into one report, and in some cases step 3 (a RAP) will also be included with the initial report.

*For the purpose of this consent application, the headings given in the checklist may be used for report section headings. **The listings are indicative and not directive** - include additional relevant topics and headings where site details or contaminant issues warrant this.*

**It would be helpful if you could indicate if the report deviates from the checklist sequence.** Include in the main text of the report all information needed to satisfy any guideline criteria that are applied to the site. If some conclusions need to be supported by large amounts of detail, such detail can be included as a separate appendix to the report, but this fact must be mentioned in the main text.

More information concerning contaminated land and discharges can be found in the Council's fact sheets.

Fact Sheet 1      Cleanfills

Fact Sheet 2      Is this a Contaminated Site?

Form B – Remediation, Disturbance Management and Discharge from Contaminated Land

Form B – General Information Answer the following and/or discuss the following items in your AEE report Where relevant, place a tick ✓ in the box if the item applies and has been provided in the report and give a reference to the section of the report it is in.

**NB:** If you are applying for remediation it is only necessary to provide a summary of sections four, five, six and nine.

Accept/  
Reject

### 1.0 SPECIALIST/AGENT DETAILS

Company:	Watercare Services Ltd	Contact Person:	Belinda Petersen
Postal address of agent:	Private Bag 92 521, Wellesley Street, Auckland 1141 Postcode: 1141		
Phone (day):	539 7477	Cellphone:	
		Fax:	
Email:	bpetersen@water.co.nz	Area of Expertise:	Resource Consent Manager

### 2.0 EXECUTIVE SUMMARY

- Background.
- Objectives of the investigation stage(s) being reported.
- Scope of work to be, or which has been, undertaken.
- Summary of conclusions and recommendations.

### 3.0 PROPOSAL

3.1 Describe the proposed works including, but not limited to, the following:

- Detailed description of the proposed activity e.g. long-term discharge / remediation / disturbance.
- A clear statement of the scope of work to be, or which has been, undertaken.
- Purpose of the proposed works.

### 4.0 SITE PLAN

4.1 Show the following on the Site Plan: (provide one set of plans reduced to A3)

- Title Box including:
- The name of the person and/or company that prepared the plans.
- Address of property/site (adjacent to the location of the proposal in the CMA)
- Date plans were drawn.
- Legend explaining symbols on the Site Plan.

## 4.0 SITE PLAN contd

- North point (orientated to the top of the page if possible).
- Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).
- Scale bar.
- Total site area in hectares (ha) or m<sup>2</sup>.
- Road frontages and names.
- Property boundary dimensions – existing and future (where relevant).
- Adjoining street numbers.
- Location of existing and proposed structures, roads, buildings, fences etc
- Direction of ground slope (indicate with arrows).
- Location of different soil types (NZ Geological Maps).
- Location of any fill, semi-consolidated sediments or reclaimed land on the site.
- Location of any geothermal features.
- The nature and extent of surface soil/lithology types and contamination plumes.
- The location of soil sampling points/test pits/soil bores.
- The lateral extent of the geological cross-section.
- Catchment areas.
- Sub catchment areas for both the existing and proposed site conditions.
- Directional stormwater flow arrows for all existing proposed channels, overland flow paths etc.
- Existing stormwater reticulation.
- Existing and proposed stormwater discharge locations.
- Amount and location of existing and proposed impervious areas.
- Existing and proposed ground cover.
- Existing and proposed underground services including public drains.
- Location of any bores (actual and/or proposed) sump or well.
- Historical location of structures that may have affected the distribution of contamination (e.g. buildings, underground storage tanks, treatment baths, etc).
- The location of present and past industrial processes, unsealed areas, waste or chemical storage.
- High risk areas and activities including:
  - Areas for vehicle and equipment maintenance and washing.
  - Location of significant past and potential future spills and leaks.
  - Underground liquid storage tanks.
  - Location of any cultural heritage features including historic, waahi tapu and Archaeological sites on the sites and environs.
  - Location of any natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site or environs.
- If the site is within the Coastal Marine Area (CMA), the location of the Mean High Water Springs (MHWS).
- Any waterfalls, wetlands, dams.
- Location of any proposed mitigation measures including low flow outlets, bypasses, fish passages, planting etc.
- Disturbed areas (including staging details).
- Amounts and location of any earthworks - show volumes and areas of cut, fill and stockpiles (include staging details where relevant).
- Existing and finished ground levels for either the whole site or the relevant work area. Show natural ground level datum points, contours and spot heights (to LINZ datum). Where appropriate, show contours to extend across boundaries.
- Either on the site plan or a separate plan, identify and show the key pathways for contaminant migration and potential receiving environments (show with point, key, title and scale).

## 5.0 SITE HISTORY

(To allow identification of potential areas and contaminants of concern and check appropriateness of sampling strategy).

5.1 Give details of the following if possible:

- Chronological list of site ownership and uses (including the relevant Hazardous Activities and Industries List codes for those uses) indicating information gaps, unoccupied periods and, if relevant, proposed uses.
- An outline of those contaminants commonly associated with each land use based on Contaminated Land Management Guidelines Schedule B, ANZSIC (1993) codes and AS4482.1/2 (1997 and 1999), and/or from site-specific information.
- District Plan Zoning – previous, present and, if relevant, proposed, with summary of reasons for changes to zoning that have occurred.
- Details of relevant building and related permits, licences, resource consents, approvals and trade waste agreements with records of compliance (e.g. relevant information held by TLA).
- Local usage of ground and surface water resources, including presence, rate and location of abstractions (current and historical).
- Provide sewer and services plans identifying active and abandoned services.
- Describe historical uses of adjacent land.
- Give relevant complaint history.
- Discuss local knowledge of site by staff and residents – present and former.
- Summary of literature relating to the site, including newspaper articles.
- Review of aerial and site photography with date and location (including direction of photography) indicated on site maps.
- Describe any previous manufacturing processes.
- Inventory of materials and waste products associated with site use and their on-site storage and/or disposal locations.
- Details and locations of current and former underground and aboveground storage tanks with details of integrity testing.
- Recorded discharges to land, water and air (authorised and unauthorised).
- On-site and off-site disposal locations.
- Contaminant source areas and pathways on-site and off-site.
- Integrity assessment (assessment of the accuracy of the information).
- Source of information used, e.g. topo/geological maps, aerial photos, source of groundwater/surface water/climatic data.

## 6.0 SITE LOCATION AND CHARACTERISTICS

6.1 Identify, describe and assess the existing site and environs including, but not limited to, the following:

- The site topography, means of measurement and site map.
- The condition of existing buildings and roadways, give the sealed per cent and unsealed per cent.
- The presence and location of drums, wastes and fill materials.
- The presence of any odours and source.
- The visual or quantified details of surface water quality.
- The surface run-off pathways (historic, existing and proposed).
- The map flood and inundation potential.
- The potential for contaminant migration through service trenches both currently used services and abandoned services.
- The inverts of services relative to appropriate groundwater levels, map cesspits, soak holes etc.
- The conditions at site boundary such as type and condition of fencing, soil stability, erosion, and stormwater discharge.
- Any visible signs of contamination such as identifiable waste products, discoloration or staining of soil, bare soil patches e.g. on-site and at site boundary.
- Any visible signs of plant stress.

## 6.0 SITE LOCATION AND CHARACTERISTICS contd

- Any relevant local sensitive environments e.g. rivers, lakes, creeks, wetlands, local habitat areas, endangered flora and fauna, groundwater, seeps, harbour, groundwater takes, surrounding bores, neighbouring land uses.

The following may help you identify any cultural heritage features on your site:

- *Check the Auckland Regional Cultural Heritage Inventory (CHI) for historic or cultural heritage information.*
- *The New Zealand Historic Places Trust has a register of historic places, Archaeological sites, historic areas waahi tapu and waahi tapu areas.*
- *The Auckland Regional Plan: Coastal (ARP:C) schedules one and two contains a list of protected and preserved historic and cultural heritage sites.*
- *District Plans have schedules of protected cultural heritage items.*
- *Appendix B of the Auckland Regional Policy Statement (ARPS) contains a list of significant natural heritage values and identifies sites and areas of special value to Tāngata Whenua.*
- *Areas/places that are significant to Tāngata Whenua may only be identified during consultation.*

- Any natural heritage features e.g. indigenous vegetation and or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc on the site or environs and any investigation undertaken.

The following may help you identify any natural heritage features on your site.

- *Check the Natural Heritage Database (held by the Council) – ask Council staff.*
- *Appendix B of the Auckland Regional Policy Statement (ARPS) identifies areas of significant natural heritage values. Volume two of the Plan Maps for the Auckland Regional Plan Coastal Protection Areas, schedule three of the ARP:C describes their values. Schedule four of the ARP:C shows areas of significant conservation value as identified by the Ministry of Conservation.*
- *Plan change nine of the ARPS and schedule three of the ARP:C identify sites that have geological, landscape or coastal heritage value, including volcanic cones and coastal protection areas.*
- *Section 3.2 and 3.3 of chapter three of the PARP:ALW provide a description and management approach for wetland management areas and natural lake management areas respectively.*
- *Schedule one of the PARP:ALW identifies significant wetlands which constitute the wetland management areas. Information on the boundaries is available from the Council's Natural Heritage Information Database. The natural lake management area contains the identified lake and a 50m buffer strip around the lake.*
- *Section 3.4 of chapter three of the PARP:ALW provides a description, criteria, and management approach for natural stream management areas.*
- *Maps series one of the PARP:ALW identifies wetland and natural lake management areas, and also illustrates natural stream management areas in an indicative manner.*

- The immediate and ultimate receiving environments including ecological characteristics and sensitivity to adverse effects.

- Sources of information used e.g. topo/geological groundwater/surface water/climatic data.

- The potential impact of soil, groundwater or other contamination on site uses and sites above plume.

- The potential impact of volatiles to air including odour and health effects.

## 7.0 GEOLOGY AND HYDROLOGY

7.1 To allow for assessment of potential for any discharge or potential discharge to soil, sediment, surface water or groundwater.

- Background groundwater and surface water quality (where not described previously).
- Summary of local meteorology.
- Describe the of site geology.
- Permeability/infiltration rate across the site for paved, unpaved areas and different soils.
- Lateral and vertical investigation of site soil and geology to the extent to which any contaminants have potentially migrated.
- Site borehole logs/test pit logs showing stratigraphy using a recognised classification system and depth to groundwater table.
- Any subsurface visual staining or odours or evidence of fire/waste materials including on site observations.
- Drill sufficient wells to characterise each contaminant source and plume (at least three wells needed to determine flow direction by triangulation).
- Provide consent reference of drilling permit and confirm logs have been submitted to the AC officer issuing the consent.
- Discuss well location and installation strategy including screen location and length field observations.
- Method used (with or without water/drilling muds) including reasons for choosing the method i.e. advantages and limitations with regard to data obtained (drilling to be carried out in accordance with NZS 4411:2001 Environmental Standard for Drilling of Soil and Rock or variations justified).
- Logs require - lithological log, aquifer / aquitard interpretation, groundwater ingress/loss, static groundwater level and well construction, sampling locations.



Accept/ Reject	7.0 GEOLOGY AND HYDROLOGY contd
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Well purging – field monitor pH, EC, Temperature, DO, Eh and graph, stabilisation of these parameters. Record the volume purged.</li> <li><input type="checkbox"/> Describe process for well abandonment e.g. leave insitu, decommission etc.</li> <li><input checked="" type="checkbox"/> Detailed map and description of location, design and construction of on-site wells, boreholes and pits.</li> <li><input checked="" type="checkbox"/> Reported range of water table depths below ground surface including to any shallow/perched aquifers and the local/regional aquifer system.</li> <li><input type="checkbox"/> Describe and locate of springs and wells in the vicinity.</li> <li><input checked="" type="checkbox"/> Location, depth and extent of imported and locally derived fill.</li> <li><input type="checkbox"/> Direction(s) and rate of groundwater flow including, where applicable, groundwater levels surveyed to a common datum and gradient i.e. provide technical basis for assumptions, sensitivity analysis and information sources.</li> <li><input type="checkbox"/> Groundwater level fluctuations, including tidal, seasonal, abstraction, infiltration.</li> <li><input type="checkbox"/> Magnitude of groundwater level variations/trends and the controls on these changes e.g. natural recharge/discharge, abstraction, potential future changes in groundwater regime.</li> <li><input type="checkbox"/> Magnitude of groundwater level fluctuations and the controls e.g. changes in abstraction rates, tides, river-level or stormwater-level fluctuations etc.</li> <li><input checked="" type="checkbox"/> Direction(s) of surface water run-off and identification of ponding areas.</li> <li><input type="checkbox"/> Preferential flow paths (groundwater).</li> </ul>
8.0 SAMPLING, ANALYSIS PLAN AND SAMPLING METHODOLOGY	
	<p>8.1 To ensure that any investigation work has been carried out appropriately.</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Provide sampling and analysis of data quality objectives for all sampling.</li> <li><input checked="" type="checkbox"/> For all sampling, provide rationale for selection of:</li> <li><input checked="" type="checkbox"/> Sampling pattern, locations and depths (as shown on site maps).</li> <li><input checked="" type="checkbox"/> Sampling density, including estimated size of the residual hotspots that may remain undetected and statistical confidence to the estimate.</li> <li><input checked="" type="checkbox"/> Which samples are/were submitted for analysis and which samples are/were not analysed.</li> <li><input checked="" type="checkbox"/> Analytes for each sample and the analytical methods used.</li> <li><input checked="" type="checkbox"/> Detailed description of the sampling methods including: <ul style="list-style-type: none"> <li><input type="checkbox"/> Sampling devices and equipment type.</li> <li><input type="checkbox"/> Sampling containers and the type of seal used.</li> <li><input type="checkbox"/> Sample handling procedures.</li> <li><input type="checkbox"/> Equipment decontamination procedures.</li> <li><input type="checkbox"/> Description of any field-screening protocols, methods and equipment and their calibration.</li> </ul> </li> </ul>
9.0 GUIDELINE VALUES	
	<p>9.1 To ensure they are applicable.</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Table listing all environmental (reference ALW Plan) and human health guideline values used for comparison with references.</li> <li><input type="checkbox"/> Demonstration that selection of 'Non ALW Plan Guidelines' values are consistent with the principles of contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guidelines Values.</li> <li><input type="checkbox"/> Assumptions and limitations of all guideline values used.</li> </ul>
10.0 RESULTS	
	<p>10.1 Of investigation work.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Summary of previous results (where applicable).</li> <li><input checked="" type="checkbox"/> Site Plan(s) showing all samples and sampling locations, giving sample identification numbers and sample depth.</li> <li><input checked="" type="checkbox"/> Table comparing analytical results to adapted threshold levels with exceedences highlighted.</li> </ul>
11.0 RESULTS	
	<p>11.1 To assist all parties in understanding the environmental processes occurring and risks present at the site.</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Assessment of the type of the extent of soil and groundwater contamination including identifiable off-site contamination that may cause adverse environmental effects.</li> <li><input checked="" type="checkbox"/> Characterisation of geological heterogeneity and anisotropy (if remediation is the only activity being applied for a summary will suffice). Refer Q.13 of Checklist B13.2 for more details if relevant.</li> </ul>

Accept/ Reject	12.0 CONCLUSIONS AND RECOMMENDATIONS
	<input checked="" type="checkbox"/> Brief summary of all relevant findings. <input checked="" type="checkbox"/> Assumptions used in making conclusions. <input checked="" type="checkbox"/> Extent of uncertainties in the results. <input type="checkbox"/> Where remedial action has been taken, provide a list summarising the activities and the physical changes to site. <input type="checkbox"/> Extent of uncertainties in the results. <input type="checkbox"/> Where remedial action has been taken, provide a list summarising the activities and the physical changes to site. <input checked="" type="checkbox"/> A clear statement that the consultant considers the site to be suitable for the current and, where applicable, the proposed use. <input type="checkbox"/> A statement detailing all limitations and constraints on use of the site (where applicable). <input type="checkbox"/> Recommendations for further work (if appropriate).
	Form B – Remediation, Disturbance Management and Discharge from Contaminated Land Form B – Long-term Passive Discharge items in your AEE report. Where relevant, place a tick ✓ in the box if the item applies and has been provided in the report.
	<b>13.0 SOIL</b>
	13.1 For soil sampling refer Ministry for the Environment Guideline Five. <input checked="" type="checkbox"/> Where site activity information is lacking, provide an analysis for common contaminants of concern – metal suite, total petroleum hydrocarbon, semi volatile organic compound, volatile organic compound, pesticides. <input checked="" type="checkbox"/> Provide rationale for selection of sampling pattern, locations and depths (as shown on site maps), including consideration of geology, odour and visual observations. <input type="checkbox"/> pH and EC temperature of the contaminants if significantly ranging risk. <input type="checkbox"/> Speciation of the contaminants if have a significantly ranging risk especially CrIII & CrVI. <input checked="" type="checkbox"/> Geological log or soil description of soil borings, test pits. <input checked="" type="checkbox"/> Log showing sample location/ depth of sample. <input checked="" type="checkbox"/> If guidelines as specified by the PARP:ALW plan or MfE guideline No. two are exceeded, undertake leaching tests to help determine the ability of contaminants to leach to groundwater and to help determine bio-availability and soil disposal requirements.
	<b>14.0 SURFACE WATER/SEDIMENT</b>
	14.1 For soil sampling refer Ministry for the Environment Guideline Five. <input checked="" type="checkbox"/> Provide justification/reasons if surface water or sediment sampling has not been done.
	<b>15.0 GROUNDWATER</b>
	15.1 For soil sampling refer Ministry for the Environment Guideline Five. <input type="checkbox"/> Provide technical justification if not sampling groundwater e.g. low permeability soils and significant separation between contaminants of concern and groundwater. <input type="checkbox"/> Describe equipment/instruments used, cleaning procedures. <input type="checkbox"/> Discuss groundwater sampling strategy (refer SANZ standard). <input type="checkbox"/> Where possible, provide data for at least three rounds of sampling and analysis, at least one summer low and one winter high round. <input type="checkbox"/> Identify and discuss contaminants of concern appropriate to site history – or where site information lacking, demonstrate confidence that contaminants of concern are identified. <input type="checkbox"/> Depth, thickness and justify likely mobility of LNAPL, DNAPL. <input type="checkbox"/> Specification of the contaminants if they have a significantly ranging risk especially CrIII & CrVI. <input type="checkbox"/> Discuss seasonal variation in data. <input type="checkbox"/> Describe drilling/logging on site observation e.g. loss core, flushed well, equipment break due to hard ground, etc.

Accept/ Reject	16.0 HYDRAULIC AQUIFER / AQUITARD TESTING
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide test methodology (slug tests should be repeated for confidence in results and include insertion and removal of slug).</li> <li><input type="checkbox"/> Provide static water level data prior to start of testing.</li> <li><input type="checkbox"/> Discuss equipment and hydraulic test procedure, and justification for why this type of test chosen (advantages/disadvantages).</li> <li><input type="checkbox"/> State test interval.</li> <li><input type="checkbox"/> Provide maximum drawdown/increase.</li> <li><input type="checkbox"/> Provide a linear plot of test data of time versus drawdown and time versus recharge.</li> <li><input type="checkbox"/> Provide group of semi-log or log-log plot analysis.</li> <li><input type="checkbox"/> Discuss well construction effects and 'skin effects' on data.</li> <li><input type="checkbox"/> Provide and discuss other relevant field data.</li> <li><input type="checkbox"/> Discuss how and when measured (season/rainfall events).</li> <li><input type="checkbox"/> Discuss tidal (continuous monitoring) when required.</li> <li><input type="checkbox"/> Reduced level survey by whom and datum.</li> <li><input type="checkbox"/> Discuss tidal (continuous monitoring) when required.</li> <li><input type="checkbox"/> Reduced level survey by whom and datum.</li> </ul>
17.0 FIELD QUALITY ASSURANCE AND QUALITY CONTROL (QA / QC)	
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Give details, including qualifications and experience, of the sampling team (identifying unique initials for each member).</li> <li><input type="checkbox"/> Statement of intended duplicate and blank frequency.</li> <li><input type="checkbox"/> Provide records for each sample collected including date, time and location, samplers' initials, duplicate/blank location and type, analyses to be performed, site observations and weather conditions.</li> <li><input type="checkbox"/> Chain of custody (identifying for each sampler) nature of the sample, collection date, analyses to be performed, sample preservation method, departure time from site, dispatch courier used.</li> <li><input type="checkbox"/> Background sample, field blank, trip blank, and rinsate sample results and laboratory prepared trip spike results for volatile analytes.</li> <li><input type="checkbox"/> Discuss decontamination procedures carried out between sampling events.</li> <li><input type="checkbox"/> State the sample-splitting techniques and field instrument calibrations (where used).</li> <li><input type="checkbox"/> Standard solution, reference sample and check sample (including daily) results.</li> <li><input type="checkbox"/> Laboratory duplicate, blank and standard results.</li> </ul>
18.0 QUALITY ASSURANCE AND QUALITY CONTROL (QA / QC) DATA EVALUATION	
	<p>18.1 Give details, including qualifications and experience, of the sampling team (identifying unique initials for each member).</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Evaluation of all field and laboratory QA/QC information listed above against the stated data quality objectives including a discussion of: <ul style="list-style-type: none"> <li><input type="checkbox"/> Documentation and data completeness.</li> <li><input type="checkbox"/> Data representativeness.</li> <li><input type="checkbox"/> Precision and accuracy for both sampling and analysis for each analyte in each environmental matrix informing data users of the reliability, unreliability or qualitative value of the data.</li> <li><input type="checkbox"/> Test reliability, the zone of influence of the test, the analysis method (confined/unconfined aquifer system) and significant assumptions in the analysis and method or data input.</li> <li><input type="checkbox"/> Discuss data comparability checks, which should include bias assessment arising from various sources, including: <ul style="list-style-type: none"> <li><input type="checkbox"/> Collection and analysis of samples by different personnel.</li> <li><input type="checkbox"/> Collection and analysis by the same personnel using the same methods but at different times (including seasonal for long-running projects).</li> <li><input type="checkbox"/> Use of different sampling or analytical methodologies from those stipulated in guideline documents.</li> <li><input type="checkbox"/> Spatial and temporal changes (because of environmental dynamics).</li> <li><input type="checkbox"/> Relative percent differences for inter and intra-laboratory duplicates.</li> </ul> </li> </ul> </li> </ul>

Accept/ Reject	19.0 RESULTS
	<input checked="" type="checkbox"/> Provide a Site Plan showing all samples and sampling locations, giving sample identification numbers and sample depth. <input type="checkbox"/> Provide a summary of all results in tabular form: <input type="checkbox"/> Identifying essential details such as sample identification numbers and sample depth. <input type="checkbox"/> Showing comparison with relevant guideline values. <input type="checkbox"/> Highlighting every result exceeding the guideline values. <input type="checkbox"/> A summary table of results containing the following statistics: minimum, maximum, arithmetic average and 95 per cent upper confidence limit on the arithmetic average for each analyte.
20.0 SITE PLAN	
	<p>20.1 Show the following on the Site Plan: (provide one set of plans reduced to A3)</p> <input type="checkbox"/> The nature and extent of surface soil/lithology types and contamination plumes. <input type="checkbox"/> The location of soil sampling points/trial pits. <input type="checkbox"/> The lateral extent of the contaminant concentrations. <input type="checkbox"/> The line of the geological cross-section. <input type="checkbox"/> In addition to a Site Plan, provide a Groundwater Plan for the existing systems and also for the proposed system if potential for significant changes to groundwater regime) showing: <input type="checkbox"/> North point, scale, key, title and date. <input type="checkbox"/> The nature and extent of surface soil/lithology types and contamination. <input type="checkbox"/> Plumes – free product plumes. <input type="checkbox"/> The location of the wells and reduced level values, screened interval. <input type="checkbox"/> The aquifer piezometric contours for each aquifer identified (may require more than one if significant piezo variation (seasonal, tides)). <input type="checkbox"/> The location and type of any aquifer boundaries. <input type="checkbox"/> Direction of groundwater flow. <input type="checkbox"/> Provide at least one cross-section of the site showing: <input type="checkbox"/> Site soil, geology and lithological variations vertically across the site and location of contaminated soil. <input type="checkbox"/> The extent of the lateral and vertical contaminant concentrations. <input type="checkbox"/> Aquifer(s), aquitard(s) e.g. unconfined, confined, leaky. <input type="checkbox"/> Depth to shallow/perched and local/regional groundwater system across the site. <input type="checkbox"/> Aquifer heterogeneity and anisotropy such as lithological layering and fracture orientation and connectivity. <input type="checkbox"/> Well locations and screen depths. <input type="checkbox"/> Base of aquifer if DNAPL.
21.0 ASSESSMENT OF EFFECTS	
	<p>21.1 Identify and assess actual and potential effects of the proposed activity on the environment:</p> <input checked="" type="checkbox"/> Assessment of the potential for chemical degradation or interaction products. <input checked="" type="checkbox"/> Assessment of possible exposure routes and risk to exposed populations (human and ecological risk). <input checked="" type="checkbox"/> Effects on any cultural heritage features including historic, waahi tapu and Archaeological sites, on the site or environs. <input checked="" type="checkbox"/> Effects on any natural heritage features e.g. indigenous vegetation and or any significant ecological or geological features or features with significant natural heritage and / or conservation values e.g. volcanic cones, wetlands etc. <input type="checkbox"/> Effects on any abstraction point for a registered drinking water supply as required by sections 6, 7 and 8 of the Resource Management (National Environment Standards for sources of Human Drinking Water) Regulations 2007. For more detail on catchments and aquifers refer to question 3.15 in Form B9 "Discharge less than or equal to 6m3/day of Domestic wastewater onto or into Land".
22.0 PROPOSED MITIGATION	
	<input checked="" type="checkbox"/> Describe the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect of the discharge.

Accept/ Reject	23.0 ONGOING SITE MONITORING
	<p>23.1 To ensure any mitigation measures proposed are working over time.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Describe proposed ongoing site monitoring requirements (if any), including monitoring locations, parameters and frequency.</li> <li><input type="checkbox"/> State results of monitoring analyses, including all relevant QA/QC requirements stated above.</li> <li><input type="checkbox"/> Discuss ongoing site or plant maintenance (e.g. containment cap integrity, etc) or contingency plans.</li> <li><input type="checkbox"/> Details of those responsible for the maintenance/monitoring programme(s).</li> <li><input type="checkbox"/> Details to be included in the annual maintenance/monitoring report, include: <ul style="list-style-type: none"> <li><input type="checkbox"/> Any changes to site owner or occupier.</li> <li><input type="checkbox"/> Any changes to activities undertaken on-site.</li> <li><input type="checkbox"/> Any changes to the physical layout of the site.</li> <li><input type="checkbox"/> Any incidents where the management plan has had to be implemented (subsurface plan has had to be implemented (subsurface works, site development etc)).</li> </ul> </li> </ul>
24.0 SITE CHARACTERISTICS	
	<p>24.1 To assist all parties in understanding the environmental processes occurring and risks present at the site. Please provide the following if readily available:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Assessment of the type of all environmental contamination, particularly in soil and groundwater.</li> <li><input type="checkbox"/> Characterisation of geological heterogeneity and anisotropy, including: <ul style="list-style-type: none"> <li><input type="checkbox"/> Aquifer/aquitard transmissivities and hydraulic conductivity, both horizontally and vertically.</li> <li><input type="checkbox"/> Storativity/specific yield.</li> <li><input type="checkbox"/> Aquifer/aquitard porosity system and fracture type, fill, orientation and connectivity.</li> <li><input type="checkbox"/> Saturated aquifer/aquitard thickness and relation to monitoring well screens.</li> <li><input type="checkbox"/> Aquifer recharge and discharge locations.</li> <li><input type="checkbox"/> Aquifer/aquitard boundaries.</li> </ul> </li> <li><input type="checkbox"/> Characterise the aquifer system: aquifer(s) and aquitard(s) types e.g. unconfined, confined, leaky, perched, recharge and discharge locations.</li> <li><input type="checkbox"/> Hydraulic tests conducted. Include plot of trends in Static Water Level (SWL), hydraulic tests and recovery, identify the zone(s) of influence of tests.</li> <li><input type="checkbox"/> Numerical/Analytical Modelling. <ul style="list-style-type: none"> <li><input type="checkbox"/> State model objectives.</li> <li><input type="checkbox"/> List all assumptions of model and relationship to conceptual model.</li> <li><input type="checkbox"/> Conduct a sensitivity analysis and identify key model inputs.</li> <li><input type="checkbox"/> Identify whether field data of assumptions.</li> <li><input type="checkbox"/> Describe model used.</li> <li><input type="checkbox"/> Results and description.</li> <li><input type="checkbox"/> Documentation.</li> </ul> </li> </ul>
<p><b>Form B – Remediation, Disturbance Management and Discharge from Contaminated Land</b>  <b>Form B – Long-term Passive Discharge items in your AEE report.</b>  Where relevant, place a tick ✓ in the box if the item applies and has been provided in the report.</p>	

Accept/ Reject	25.0 REMEDIAL ACTIONS OR WORK PLANNED
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Remediation and / or disturbance goal(s).</li> <li><input type="checkbox"/> Discussion of the remedial options available, including the status quo, identifying the means of risk reduction proposed in each.</li> <li><input type="checkbox"/> Rationale for selection of the recommended remedial option.</li> <li><input type="checkbox"/> Discussion of the extent of remediation and/or disturbance required to achieve the goal(s).</li> <li><input type="checkbox"/> Identification of regulatory requirements such as permits, licences and approvals.</li> <li><input type="checkbox"/> Pre-remediation and/or disturbance site management plan (e.g. fencing, warning signs, stormwater diversion etc).</li> <li><input type="checkbox"/> Methods proposed to minimise effects on groundwater from works.</li> <li><input type="checkbox"/> Names and phone numbers of appropriate personnel to contact during remediation and/or disturbance.</li> <li><input type="checkbox"/> Demonstration of the disposal route for any material to be disposed off-site.</li> <li><input type="checkbox"/> Remediation and/or disturbance schedule, including proposed hours of operation.</li> <li><input type="checkbox"/> Proposed testing to validate the site during and on-completion of the works.</li> <li><input type="checkbox"/> Contingency plan if remedial strategy fails to reach the remediation goals.</li> <li><input type="checkbox"/> Staged progress reporting (for long-running projects).</li> <li><input type="checkbox"/> Site Validation Works: <ul style="list-style-type: none"> <li>• Summary of compliance with respect to the objectives and protocols of the approved RAP.</li> <li>• A summary table of validation results, highlighting exceedences.</li> <li>• Assessment of remaining exposure routes/risks.</li> <li>• Copy of landfill receipts.</li> </ul> </li> </ul>
	<b>26.0 SITE MANAGEMENT PLAN</b>
	<p>26.1 To ensure the management of any ongoing effects from the site.</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Provide an operational remediation and/or disturbance site management plan including (where applicable):</li> <li><input type="checkbox"/> Suggested trigger levels for each contaminants of concern for soil, sediment, groundwater and storm water.</li> <li><input type="checkbox"/> Predicted changes of groundwater due to site redevelopment, both during and after.</li> <li><input type="checkbox"/> Effects of any groundwater diversion or other dangers to groundwater flow.</li> <li><input checked="" type="checkbox"/> Future uses and expected development/ excavation.</li> <li><input checked="" type="checkbox"/> Stormwater controls proposed, especially during earth working.</li> <li><input checked="" type="checkbox"/> Any requirements for groundwater diversion consent.</li> <li><input type="checkbox"/> Contact at city/district council.</li> <li><input type="checkbox"/> Community relations/liaison regarding long-term plans and site management.</li> <li><input checked="" type="checkbox"/> Stormwater and soil management.</li> <li><input checked="" type="checkbox"/> Noise and odour control.</li> <li><input checked="" type="checkbox"/> Dust control (including wheel wash).</li> <li><input checked="" type="checkbox"/> Contingency plans to respond to site incidents to obviate potential effects on the surrounding environment and community.</li> <li><input type="checkbox"/> Proposed long-term site management.</li> <li><input type="checkbox"/> Occupational safety and health issues and measures.</li> </ul>
	<b>27.0 CONCLUSIONS AND RECOMMENDATIONS</b>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Recommendations for how validation work will be undertaken, and contingency plans for the site and further work should validation show that further remediation is required.</li> </ul>

# Application for a coastal permit coastal activities



Form B23

Office Use Only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

## Coastal activities – why is a resource consent required?

Section 12 of the Resource Management Act 1991 (RMA) provides for regulation of activities within the Coastal Marine Area (CMA).

The CMA includes the foreshore, seabed, and coastal water, and the air space above the water.

The Auckland Regional Plan: Coastal sets out the criteria for assessing applications for activities in the CMA as required under section 12 of the RMA.

Section 12(1) states that certain works such as reclamation, foreshore damage, plant removal etc can occur only if permitted by a regional coastal plan or a resource consent is obtained.

Section 12(2) requires an occupation consent to be obtained if any use (such as a mooring or jetty) occupies a space in the CMA unless allowed by a rule in a regional coastal plan.

Section 12(3) regulates activities within the CMA.

Resource consents may be required under any one or a combination of sections 12(1), (2) and (3). However, only one application needs to be lodged and one coastal permit will be issued.

**Copies of applications for reclamations, structures, harbour works, and the removal of material will be forwarded in accordance with the requirements of section 89A to Maritime New Zealand (MNZ), who will report to the Council on any navigational matters within 15 working days including any conditions it considers should be included in the consent for navigation related purposes.** This may attract extra costs from the MNZ which will be invoiced directly.

P0121.3 08/07/10



## 1.0 SPECIALIST/AGENT DETAILS

Company:	Watercare Services Ltd	Contact Person:	Belinda Petersen
Postal address of agent:	Private Bag 92 521, Wellesley Street, Auckland Postcode: 1141		
Phone (day)	539 7477	Cellphone:	
		Fax:	
Email:	bpetersen@water.co.nz	Area of Expertise:	Resource Consents Manager

## 2.0 DESCRIPTION OF PROPOSAL

2.1 Indicate if your application affects any of the following:

- Any reclaiming or draining of any part of the foreshore or seabed.
- The erecting, reconstructing, placing, altering, extending, removing or demolishing of any structure or any part of a structure in the CMA.
- The disturbance of any part of the foreshore or seabed (including by excavating, drilling, or tunnelling) in a manner that is likely to have an adverse effect on the foreshore or seabed.
- The depositing of any substance in, on or under the CMA.
- Destroying, damaging or disturbing of any part of the foreshore or seabed in a manner that is likely to have an adverse effect on plants or animals or their habitat.
- The introduction or planting of any exotic or introduced plant in, on or under the CMA.
- Destroying, damaging or disturbing of any part of the foreshore or seabed in a manner that is likely to have an adverse effect on historic heritage.
- The occupation of any part of the CMA.
- The removal of any sand, shingle, shell, or other natural material.
- Carrying out any activity in the CMA in a manner that contravenes a rule in the Auckland Regional Plan: Coastal.
- Any discharge of contaminants into the CMA.

2.2 Provide a description of activities to be undertaken (i.e. the proposal) including the activities for which any structure, work, reclamation is to be used for? If the proposed activity / activities is an event or activity with no associated works or structures, describe the proposed activity e.g. special maritime event such as a yacht race series.

2.3 Describe the purpose of the proposed activities and identify the term of consent sought.

In terms of the Auckland Regional Plan Coastal the proposed site is within a Management Area, (refer Part 11 of the ARP:C)

General Management Area  
CPA1 (tunnel only)

2.4 In accordance with section 12 of the RMA, the proposal is to undertake: (tick relevant boxes)

- Works in the CMA - section 12(1).
- Occupation of the CMA - section 12(2).
- Activities in the CMA – section 12(3).
- Discharge of contaminants into the CMA – section 15 (1).
- Discharge into the CMA – section 15A. (Dumping and incineration of waste)

2.5 Is exclusive occupation of the CMA proposed? (i.e. is it proposed that any other party/public be excluded from an area of the CMA?)

Map Reference

mE

mN

Use New Zealand Transverse Mercator (NZTM) e.g. 1756730mE 5919740mN

Use a geographic positions system (GPS) device if possible to obtain a map reference accurate to 10m. The northing follows the easting. If you do not have a map reference, ensure that the location is marked to an accuracy of 10m on your location plan.

2.6 Is your site within the Hauraki Gulf Marine Park? (Refer to the Regional Plan Coastal Map 7, Sheet 1.)

If so you will need to take the requirements of the Hauraki Gulf Marine Park Act 2000 into account in your assessment. (Council staff can advise you regarding the Act and your responsibilities).

**3.0 SITE PLAN****3.1 Show the following on the Site Plan: (provide one set of plans reduced to A3)**

- Title Box including:
  - The name of the person and/or company that prepared the plans.
  - Address of property/site (adjacent to the location of the proposal in the CMA).
  - Date plans were drawn.
- Unique plan reference or identification or variation number where relevant.
- Legend explaining symbols on the Site Plan.
- North point (*orientated to the top of the page if possible*).
- Appropriate metric scale e.g. 1:2000 (1cm = 20m) and page size reference (e.g. @ A3).
- Scale bar.
- Total site area in hectares or m<sup>2</sup> (if relevant).
- Road frontages and names.
- Property boundary dimensions – existing and future (where relevant).
- Location of the line of Mean High Water Springs (MHWS).
- Location of any fill or reclaimed land on the site.
- Location of any proposed mitigation measures including planting, public access/use, naturalisation, design etc.
- Location of any cultural heritage features including historic, waahi tapu and Archaeological sites on the site and environs.
- Location of any natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features, or features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands etc. on the site and environ.
- Existing and proposed stormwater discharge locations and design.
- Location and extent of any existing or proposed esplanade reserve.
- Location of existing and proposed structures (e.g. any other jetties, moorings, roads, buildings, fences etc) in the environs
- Existing and proposed underground services including public drains.
- Location of existing vegetation and any proposed removal or planting.
- Existing and finished seabed/foreshore levels for either the whole site or the relevant work area. Show level datum points, contours and spot heights (to LINZ datum).
- Dimensions of the proposed structures and area of works e.g. the length, width, height of a proposed jetty

**4.0 SITE LOCATION AND CHARACTERISTICS****4.1 Identify, describe and assess the existing site area of the CMA and environs including, but not limited to, the following**

- Area (size) of the CMA proposed to be occupied.
- The site values e.g. conservation values, recreational values.
- The relevant physical coastal parameters such as: See AEE Part A s9, Part B s8 and s10
  - Morphology: describe features e.g. dunes, beach berm, intertidal bank. Use descriptors e.g. height, slope.
  - Discuss any evidence of coastal change e.g. erosion forming slips, caves, undermining.
  - Beach sediment characteristics: grain size, composition, sorting, colour.
  - Soil/ rock type: e.g. material, strength, colour, susceptibility to erosion.
  - Lithology: e.g. bedding planes, fractures.
  - Tide regime: range and character.
  - Water level: indicators of variable water levels e.g. storm cut platform, strand lines.
  - Current regime: typical direction and speed of currents.
  - Wave climate: wave height, period, direction, frequency.
  - Wind regime: direction, speed and frequency.

**4.0 SITE LOCATION AND CHARACTERISTICS contd**

- Identification of the flora and fauna, particularly of any protected species and their habitats:
- Any cultural heritage features including historic, waahi tapu and Archaeological sites on the site, or environs and any investigation undertaken.
- The following may help you identify any cultural heritage features on your site:*
- *Check the Auckland Regional Cultural Heritage Inventory (CHI) for historic or cultural heritage information.*
  - *The New Zealand Historic Places Trust has a register of historic places, Archaeological sites, historic areas waahi tapu and waahi tapu areas.*
  - *The Auckland Regional Plan: Coastal (ARP:C) schedules one and two contains a list of protected and preserved historic and cultural heritage sites.*
  - *District Plans have schedules of protected cultural heritage items.*
  - *Appendix B of the Auckland Regional Policy Statement (ARPS) contains a list of significant natural heritage values and identifies sites and areas of special value to Tāngata Whenua.*
  - *Areas/places that are significant to Tāngata Whenua may only be identified during consultation*
- Any natural heritage features e.g. rock formations, wetlands and / or any significant ecological or geological features or features with significant natural heritage and/or conservation values e.g. coastal protection areas on the site or environs and any investigation undertaken.
- The following may help you identify any natural heritage features on your site.*
- *Check the Natural Heritage Database (held by the Council) – ask Council staff.*
  - *Appendix B of the Auckland Regional Policy Statement (ARPS) identifies areas of significant natural heritage values. Volume two of the Plan Maps for the Auckland Regional Plan Coastal Protection Areas, schedule three of the ARP:C describes their values.*
  - *Schedule four of the ARP:C shows areas of significant conservation value as identified by the Ministry of Conservation.*
  - *Plan change nine of the ARPS and schedule three of the ARP:C identify sites that have geological, landscape or coastal heritage value, including volcanic cones and coastal protection areas.*
- Identification of existing uses of the site/CMA area and adjoining areas

**5.0 RECLAIMATIONS**

- Discuss whether or not an esplanade reserve or esplanade strip to be provided. Not applicable
- Provide a plan defining the area to be reclaimed including its location, the position of all new boundaries and the portion (if any) of that area to be set apart as an esplanade reserve.

**6.0 DISCHARGE OF CONTAMINANTS/DISTURBANCE OF FORESHORE AND SEABED ACTIVITIES**

- The type and quantity of contaminants that will be discharged or the disturbance that will be undertaken:
- Will the material discharged be significantly different from that at the location of the discharge?:
- The receiving environment and its sensitivity to the discharge:
- Identify if material will accumulate in the CMA and if so, discuss where:
- Discuss the physical effect the discharge/disturbance will have on the site, or other areas where it may accumulate.
- Discuss any obvious signs of coastal erosion at the site (or adjacent to) the discharge/disturbance?
- Discuss whether the degree of discharge to the CMA has changed or is it likely to change/increase in the foreseeable future? e.g. development in the catchment increased the volume or the rate of discharge, direction of discharges into system, location of discharge into the CMA.
- Discuss whether alternative options for the discharge/disturbance have been considered, including discharge into other receiving environments, and if so provide details.

**7.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT**

7.1 Identify, describe and assess the actual or potential effects of the proposed activity on the environment including, but not limited to, the following: See AEE Part A s11.12, 12.11

**7.1.1 Effects on Natural Landscape and Visual Character**

- Effects on natural character/visual landscape.
- Discuss the extent to which the location still has natural character and the particular elements which compromise that character.
- The extent to which natural character will be affected by the proposed activity/activities.

**7.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT contd**

- An assessment of visual/landscape effects which may include, but is not limited to, the following:
- Description of the nature of the works, including visual characteristics.
- Description of the setting or context of the site where the proposed activities are to be undertaken.
- Description of the immediate setting of the proposed site.
- Description of the effects of the proposal to the setting of the site and any affected parties. Define and quantify affected viewing parties.

**7.1.2 Effects on Natural Features, Natural Heritage Features and Ecosystems**

- Discuss any effects on natural heritage features e.g. indigenous vegetation and/or any significant ecological or geological features with significant natural heritage and/or conservation values e.g. volcanic cones, wetlands vegetation, etc on the site or environs and any investigation undertaken.
- Provide an assessment of natural features and ecosystems which may include, but is not limited to, the following:
  - Representativeness – how a site represents the original natural character of the area.
  - Diversity and pattern – the number and type of species and communities and their distribution.
  - Rarity and special features – whether a site contains threatened species, unusual features or natural heritage features.
  - Naturalness – how similar this site would be to a site unaffected by humans or pests.
  - Long term sustainability – the likelihood that the natural features and/or ecosystem will continue to exist in the long term.
  - Buffering – whether a site is protected from surrounding land uses.
- Wildlife habitat values e.g. a wetland for birds.
- Important natural landforms e.g. a volcanic lava flow, sea cliff.

**7.1.3 Effects on Cultural Heritage Values**

- Discuss any effects on cultural heritage features including historic, waahi tapu and Archaeological sites on the site or environs and any investigation undertaken.
- Are there any features recorded in the Cultural Heritage Inventory in the vicinity of the proposal? Describe effects of your proposed activity on these features.
- The extent to which the place reflects or, is representative of Auckland or New Zealand history and the frequency with which other similar examples can be found.
- The importance of the place to Tāngata Whenua.
- The importance of the place to the community.
- The potential of the place to provide information about Auckland or New Zealand's cultural, social or natural history.

**7.1.4 Effects on Public Access, including navigation, to and along the CMA?**

- How will access to the CMA be affected?
- Will members of the public be able to move over the structure, through the activity area, the area occupied, in order to gain access to, from and along the CMA?
- Any proposed limitations on public access, and the reasons for such limitations.
- Does the proposed activity/activities involve occupation of space in the CMA. If so, does it involve the exclusive occupation of space?
- Has the Harbourmaster been consulted on navigation and safety matters? Provide details of the consultation.
- Are there any issues in terms of the Council Navigation and Safety Bylaws?

**7.1.5 Effects on the Existing Uses in the Area - include the following:**

- The existing and potential activities that are/may be undertaken in the area, including within the CMA and on the adjacent land.
- The local and broader community, social and economic values of the site.
- The effects that will result from the proposed activity or existing uses in the area

**7.1.6 Coastal Erosion Management Activities**

- Describe and define the cause of any erosion or scouring resulting from the proposed activities, including identifying what is at risk from erosion.
- Describe the reasons for selecting the proposed option of erosion management.

Accept/  
Reject

## 7.0 ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT contd

### 7.1.7 Construction Methodology

- Describe and discuss construction methodology and management practices.
- Provide an assessment of the effects of construction activities, including:
  - The schedule of the duration and timing of the works.
  - Access requirements to the site during construction.
  - Define the extent of required earthworks.
  - Discuss the potential effects on health and safety.

## 8.0 MITIGATION

8.1 Discuss measures to be undertaken to avoid, remedy or mitigate adverse effects on the environment including, but not limited to, the following:

- Provide an assessment of the likely effectiveness of proposed mitigation measures.
- Discuss any proposed conditions of consent

## 9.0 CONSULTATION

Where consultation has taken place with Iwi and/or any other interested person, details of the consultation undertaken, including the views of those consulted and your response to their concerns/issues must be provided. Copies of any correspondence confirming this consultation should be attached to this form

9.1 Describe and discuss the consultation undertaken (who was consulted and why?):

See AEE Part A Section 8

9.2 Describe and discuss the response from those consulted:

9.3 Describe your response to the views of those consulted:

## 10.0 CONSULTATION

- Describe how environmental effects will be monitored.
- Describe how the integrity of any proposed structure will be monitored

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

This checklist is not exhaustive and you may be required to submit other information with your application. During the course of processing the application it may be identified that further information is requested to continue with the assessment to enable a better understanding of the effects of the application.

## SECTION 1

### 1.0 GENERAL

**Zone:**  **Road Classification:**

**Limitations:** (e.g. contamination, soil warning area, coastal management area)

I have attached information as per information requirements for Resource Consents, as specified in the Auckland City District Plan 1999 – Isthmus Section – Clause 6D.2.0 Operative Plan (ODP) and the Proposed Plan (PDP)

I have attached the following specialist(s) report(s) (provide title, author and date in the space below).

I have attached plan(s) prepared in accordance with Guidance Note 1, Preparation of Plans.

- Site Plan showing the EXISTING situation on the subject site
- Plan/s showing the PROPOSED Activity
- Elevation Drawings of all buildings / structures to be built or altered

**And/or**

- General Subdivision requirements (applicable to subdivision applications only)

## SECTION 2

### 2.0 GENERAL RULES OF THE DISTRICT PLAN

**Does the proposal involve building, development or subdivision on land that is known to be or likely to be subject to flooding/inundation, or affected by an overland flow path - refer Part 5D of the Plan**

Yes  No

If yes, a flood assessment from a suitably qualified person may be required to be provided with the application.

**Does the proposal involve building, development (including earthworks and vegetation removal) or subdivision on land that is known to be or likely to be subject to erosion, slope instability, or subsidence – refer Part 5D of the Plan**

Yes  No

If yes, a geotechnical assessment from a suitably qualified person may be required to be provided with the application.

## 2.0 GENERAL RULES OF THE DISTRICT PLAN contd

**Is the subject site contaminated; have chemicals been stored/sprayed used previously on the site (e.g. formerly used for horticultural purposes, or industrial activities) – refer Part 5E of the Plan.**

Yes

No

If yes, a soil contamination assessment from a suitably qualified person may be required to be provided with the application.

**Are there high tension electricity powerlines (lines and/or pylons) over or adjacent to the subject site?**

Yes

No

If yes, confirmation from a suitably qualified person may be required that any proposed buildings / earthworks complies with the required clearance requirements (contact Transpower on 0800 843 474 if you require further information).

Tunnel located beneath Power substation (White Swan Road)

**Does the proposal involve significant earthworks- refer Part 4A and relevant zone rules.**

Yes

No

If yes, a site management plan may be required to be provided with the application, this should detail (but not limited to) the following: sediment and erosion control plan; timelines; noise and dust controls; hours of operation.

**Does either the site and /or proposal involve the storage or use of hazardous substances?**

Yes

No

If yes, provide an appropriate assessment in terms of the matrix in Part 5E of the Plan.

**Does the proposal comply with the noise controls of the Plan?**

Yes

No

Refer Part 4A and relevant zone rules. If the proposal complies confirm this. Particularly for childcare centres, taverns and complex construction projects a report from a suitably qualified consultant with recommendations and mitigation measures may be required.

**Is the site situated in the Business 2 or 3 zone?**

Yes

No

Refer Part 4B of the Plan – a financial contribution will be payable for any additional floor area, this is separate to the required development contribution.

**Does the site contain any scheduled items and/or heritage areas?**

Yes

No

Refer Part 5C, and Appendix 1, 2, 3 and 4 of the Plan – please contact Council's Heritage Department and discuss the proposal prior to the lodgement of the application. See Sections 9 and 12.

Tunnel at depth through Isthmus

**Does the site have any archaeological or geological features on it?**

Yes

No

Refer Planning Map 2 and Part 5C of the Plan – seek input from the Council's Heritage division prior to submitted your application.

Tunnel at depth through Isthmus. See Sections 9 and 12.

**Does the proposal require the removal of, or works in the dripline of, any generally protected tree?**

Yes

No

Refer Part 5C of the Plan for details – indicate the trees on the site plan, the species and size, a report from a suitably qualified consultant with recommendations and mitigation measured may be required.

**Does the proposal involve works to a street tree?**

Yes

No

Refer Part 5C of the Plan – Council's ACR Services' landowner approval will be required and it is recommended that approval is obtained prior to lodgement of the application.

**Is the proposal for or part of a network utility service?**

Yes

No

If yes, provide adequate assessment of the proposal in relation to Part 4A.2 of the Plan. Technical reports may also be required.

Refer Section 14.5.7



## 2.0 GENERAL RULES OF THE DISTRICT PLAN contd

**Does the proposal include any signs?**

Yes

No

Identify these on the plans, including scale and type and provide an assessment.

## SECTION 3

### 3.0 ZONE RULES

Refer to the specific zone requirements for your proposal:

- Part 7 – Residential Activity
- Part 8 – Business Zones and Mixed Use Activity
- Part 9 – Open Space and Recreation Activity
- Part 10 – Special

Where appropriate provide an assessment against the Objectives and Policies and Assessment Criteria.

Confirm compliance with or provide an assessment against the relevant Development Controls – include calculation tables.

## SECTION 4

### 4.0 TRANSPORTATION (PART 12 OF THE PLAN)

**Does the proposal comply with the parking and loading requirements for the activity?** N/A

Yes

No

Provide a table showing existing and proposed requirements; and assess non-compliance as appropriate. If there is a shortfall a report from a suitably qualified consultant may be required.

**Does the proposal comply with carpark dimensions, manoeuvring requirements and gradients of parking spaces and driveways?** N/A

Yes

No

Show compliance and assess areas of non-compliance. A report from a suitably qualified consultant to address areas of non-compliance may be required.

**Does the proposal involve works within the road reserve or will it result in a significant impact on the local roading network?**

Yes

No

Transport Assets approval should be sought prior to lodgement of the application.

## SECTION 5

**5.0 SUBDIVISION RULES (PART 11 OF THE PLAN)** Not applicable to this project

**Is the site in a soakage area?**

Yes

No

Provide a soakage report from a suitably qualified consultant.

**Is the proposal for a cross lease, unit title or company lease?**

Yes

No

Provide sufficient information to demonstrate that the buildings have existing use rights, comply with the district plan, or have resource consent.

**Does the proposal require works on a neighbouring site?**

Yes

No

A right of entry consent from the owners of these sites is required.

**6.0 OTHER REQUIREMENTS AND OTHER LEGISLATION**

**Is the subject site located within the catchment of the Hauraki Gulf as defined by the Hauraki Gulf Marine Park Act?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, then the proposal needs to be assessed with regard to the recognition of national significance and management of the Hauraki Gulf (Sections 7 and 8) and included with the application. See Section 14.4

**Does the proposal involve a building listed on the New Zealand Historic Places Trust register?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

If yes, it is recommended you obtain NZHPT written approval prior to lodgement of the application.

**Does the proposal involve access onto a State Highway or contain signs fronting a State Highway?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

NZTA approval will be required and it is recommended that approval is obtained prior to lodgement of the application.

**Does the proposal involve works on land owned by the Council, e.g. a reserve or park?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

Council's ACR Policy landowner approval will be required and it is recommended that approval is obtained prior to lodgement of the application.

**Does the proposal require the separation of or upgrading of any stormwater or water lines?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
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Contact Council's Development Engineering team prior to lodgement of the application.

**Does your Certificate of Title contain a limit as to parcels limitation?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Obtain written confirmation from a registered surveyor that the boundary lines are accurate and the coverage calculations appropriate prior to lodgement of the application.

**Will your proposal require the removal of a building line restriction from your Certificate of Title?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Contact Council's Transport Department for more information.

# Auckland City District Plan – Isthmus Section

NES for Assessing and Managing Contaminants in Soil

Form B3



Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

This checklist is not exhaustive and you may be required to submit other information with your application. During the course of processing the application it may be identified that further information is requested to continue with the assessment to enable a better understanding of the effects of the application.

## SECTION 1

### 1.0 GENERAL

**Zone:**  **Road Classification:**

**Limitations:** (e.g. contamination, soil warning area, coastal management area)

I have attached information as per information requirements for Resource Consents, as specified in the Auckland City District Plan 1999 – Isthmus Section – Clause 6D.2.0 Operative Plan (ODP) and the Proposed Plan (PDP)

I have attached the following specialist(s) report(s) (provide title, author and date in the space below).

I have attached plan(s) prepared in accordance with Guidance Note 1, Preparation of Plans.

- Site Plan showing the EXISTING situation on the subject site
- Plan/s showing the PROPOSED Activity
- Elevation Drawings of all buildings / structures to be built or altered

**And/or**

- General Subdivision requirements (applicable to subdivision applications only)

## SECTION 2

### 2.0 GENERAL RULES OF THE DISTRICT PLAN

**Does the proposal involve building, development or subdivision on land that is known to be or likely to be subject to flooding/inundation, or affected by an overland flow path - refer Part 5D of the Plan**

Yes  No

If yes, a flood assessment from a suitably qualified person may be required to be provided with the application.

**Does the proposal involve building, development (including earthworks and vegetation removal) or subdivision on land that is known to be or likely to be subject to erosion, slope instability, or subsidence – refer Part 5D of the Plan**

Yes  No

If yes, a geotechnical assessment from a suitably qualified person may be required to be provided with the application.

P0101.2 06/07/10

## 2.0 GENERAL RULES OF THE DISTRICT PLAN contd

**Is the subject site contaminated; have chemicals been stored/sprayed used previously on the site (e.g. formerly used for horticultural purposes, or industrial activities) – refer Part 5E of the Plan.**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, a soil contamination assessment from a suitably qualified person may be required to be provided with the application.

**Are there high tension electricity powerlines (lines and/or pylons) over or adjacent to the subject site?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, confirmation from a suitably qualified person may be required that any proposed buildings / earthworks complies with the required clearance requirements (contact Transpower on 0800 843 474 if you require further information).

**Does the proposal involve significant earthworks- refer Part 4A and relevant zone rules.**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, a site management plan may be required to be provided with the application, this should detail (but not limited to) the following: sediment and erosion control plan; timelines; noise and dust controls; hours of operation.

**Does either the site and /or proposal involve the storage or use of hazardous substances?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, provide an appropriate assessment in terms of the matrix in Part 5E of the Plan.

Construction activities, e.g. refuelling, refer Sec 6.18

**Does the proposal comply with the noise controls of the Plan?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Refer Part 4A and relevant zone rules. If the proposal complies confirm this. Particularly for childcare centres, taverns and complex construction projects a report from a suitably qualified consultant with recommendations and mitigation measures may be required.

**Is the site situated in the Business 2 or 3 zone?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Refer Part 4B of the Plan – a financial contribution will be payable for any additional floor area, this is separate to the required development contribution.

**Does the site contain any scheduled items and/or heritage areas?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
------------------------------	--

Refer Part 5C, and Appendix 1, 2, 3 and 4 of the Plan – please contact Council's Heritage Department and discuss the proposal prior to the lodgement of the application.

**Does the site have any archaeological or geological features on it?**

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

Refer Planning Map 2 and Part 5C of the Plan – seek input from the Council's Heritage division prior to submitted your application.

See Sections 9 and 12.

**Does the proposal require the removal of, or works in the dripline of, any generally protected tree?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

Refer Part 5C of the Plan for details – indicate the trees on the site plan, the species and size, a report from a suitably qualified consultant with recommendations and mitigation measured may be required.

**Does the proposal involve works to a street tree?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

Refer Part 5C of the Plan – Council's ACR Services' landowner approval will be required and it is recommended that approval is obtained prior to lodgement of the application.

**Is the proposal for or part of a network utility service?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, provide adequate assessment of the proposal in relation to Part 4A.2 of the Plan. Technical reports may also be required.

Refer Section 14.5.7

## 2.0 GENERAL RULES OF THE DISTRICT PLAN contd

**Does the proposal include any signs?**

Yes

No

Identify these on the plans, including scale and type and provide an assessment.

## SECTION 3

### 3.0 ZONE RULES

Refer to the specific zone requirements for your proposal:

- Part 7 – Residential Activity
- Part 8 – Business Zones and Mixed Use Activity
- Part 9 – Open Space and Recreation Activity
- Part 10 – Special

Where appropriate provide an assessment against the Objectives and Policies and Assessment Criteria.

Confirm compliance with or provide an assessment against the relevant Development Controls – include calculation tables.

## SECTION 4

### 4.0 TRANSPORTATION (PART 12 OF THE PLAN)

**Does the proposal comply with the parking and loading requirements for the activity?** N/A

Yes

No

Provide a table showing existing and proposed requirements; and assess non-compliance as appropriate. If there is a shortfall a report from a suitably qualified consultant may be required.

**Does the proposal comply with carpark dimensions, manoeuvring requirements and gradients of parking spaces and driveways?** N/A

Yes

No

Show compliance and assess areas of non-compliance. A report from a suitably qualified consultant to address areas of non-compliance may be required.

**Does the proposal involve works within the road reserve or will it result in a significant impact on the local road network?**

Works within the road reserve

Yes

No

Transport Assets approval should be sought prior to lodgement of the application.

## SECTION 5

**5.0 SUBDIVISION RULES (PART 11 OF THE PLAN)** Not applicable to this project

**Is the site in a soakage area?**

Yes

No

Provide a soakage report from a suitably qualified consultant.

**Is the proposal for a cross lease, unit title or company lease?**

Yes

No

Provide sufficient information to demonstrate that the buildings have existing use rights, comply with the district plan, or have resource consent.

**Does the proposal require works on a neighbouring site?**

Yes

No

A right of entry consent from the owners of these sites is required.

## SECTION 6

### 6.0 OTHER REQUIREMENTS AND OTHER LEGISLATION

**Is the subject site located within the catchment of the Hauraki Gulf as defined by the Hauraki Gulf Marine Park Act?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

If yes, then the proposal needs to be assessed with regard to the recognition of national significance and management of the Hauraki Gulf (Sections 7 and 8) and included with the application. See Section 14.4

**Does the proposal involve a building listed on the New Zealand Historic Places Trust register?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
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If yes, it is recommended you obtain NZHPT written approval prior to lodgement of the application.

**Does the proposal involve access onto a State Highway or contain signs fronting a State Highway?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
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NZTA approval will be required and it is recommended that approval is obtained prior to lodgement of the application.

**Does the proposal involve works on land owned by the Council, e.g. a reserve or park?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

Council's ACR Policy landowner approval will be required and it is recommended that approval is obtained prior to lodgement of the application.

**Does the proposal require the separation of or upgrading of any stormwater or water lines?**

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
---	-----------------------------

Contact Council's Development Engineering team prior to lodgement of the application.

**Does your Certificate of Title contain a limit as to parcels limitation?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
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Obtain written confirmation from a registered surveyor that the boundary lines are accurate and the coverage calculations appropriate prior to lodgement of the application.

**Will your proposal require the removal of a building line restriction from your Certificate of Title?**

<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
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Contact Council's Transport Department for more information.

Office use only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

This checklist is not exhaustive and you may be required to submit other information with your application. During the course of processing the application it may be identified that further information is required to continue with the assessment to enable a better understanding of the effects of the application.

**SECTION 1**

**1.0 GENERAL**

**I have attached the following specialist(s) report(s)** (provide title, author and date in the space below).

Refer AEE

**I have attached plan(s) prepared in accordance with Guidance Note 1, Preparation of Plans.**

- Site Plan showing the EXISTING situation on the subject site
- Plan/s showing the PROPOSED Activity
- Elevation Drawings of all buildings / structures to be built or altered
- And/or**
- General Subdivision requirements (applicable to subdivision applications only)

**In addition to the guidance notes I have attached plans that identify the following.**

- Position, drip line and identification of any protected trees, notable trees or stands of trees shown
  - Any Protected species of trees — these are species identified which stand 6 metres or greater in height [see schedule 6C – Chapter 6, Operative District Plan]
  - Any Notable trees or stands of trees [see schedule 6B – Chapter 6, Operative District Plan]
- On-site pedestrian movement and vehicle manoeuvring shown Temporary and permanent access
- Details of proposed signage including location and elevation(s) No signage proposed
- Rubbish storage area shown

**SECTION 2**

**2.0 ALL APPLICATIONS**

**Have the items on the Council's Land Information Register for the application site been addressed?**

Yes       No

**Has any Iwi consultation been undertaken?**

Yes       No

If yes, please provide appropriate details.

Refer AEE Part A Section 8



### Have you provided a full explanation and assessment of the application?

 Yes No

For example:

- The proposed use for the site and each building, hours of operation of the proposed activity
- The number of people employed and/or accommodated on the site
- The type and frequency of vehicle movements to and from the site
- Describe the types and methods of storage of materials on site
- Show the extent and describe the use of the balance of the property if proposal is a subdivision
- Provide a geotechnical investigation report/statement tailored to the specific site
- Identify and describe any hazardous substance(s) manufactured, stored, transported, used or disposed of from the site
- Describe the type, frequency and duration of any discharge of contaminants into the environment including odour, dust and noise
- The proposed methods for the treatment and or disposal of effluent, stormwater or any contaminant and the management of any stormwater overland flowpath
- The proposed extent of land modification [earthworks, including quantity of material], the location for disposal of excess soil, and the methods to manage soil erosion/situation from the site

### Does the subject site contain any recorded archaeological sites (see schedule 6A- Chapter 6, Manukau Operative District Plan) or involve a waahi tapu known to Council?

 Yes No

If yes, and the proposal will involve and/or potential the alteration of the archaeological site/waahi tapu then a Conservation Plan/Archaeological Assessment by a suitably qualified person may be required to be provided with the application.

### Is the subject site contaminated with chemicals that have been stored/sprayed previously on the site (e.g. formerly used for horticultural purposes, or industrial activities)? Consent being sought under NES (see separate form)

 Yes No

If yes, a soil contamination assessment from a suitably qualified person may be required to be provided with the application. Refer AEE Part A Sec 9 and Part B

## SECTION 3

### 3.0 INFRASTRUCTURAL AND EARTHWORK REQUIREMENTS

#### Engineering Plans

- Manukau District Plan standard detail drawings appropriate to application  
*Existing infrastructure, proposed water courses, public cesspits, stormwater and wastewater pipes and water supply systems within and adjacent to the site.*
- Power, gas (where applicable), telephone services, land street lighting layout shown [existing and proposed]

#### Wastewater and Stormwater

- Connections shown for all proposed lots / units
- Long-sections and all required details shown
- Minimum depth of service connections shown [1.2m]
- Existing and proposed onsite stormwater and wastewater disposal detailed

#### Water Supply

- Water connections shown for all lots
- All proposed valves, hydrants, bends shown
- Pipe materials specified
- Ducted rider mains for six or more lots served off accessway
- Location and depth of water tank(s)

#### Roading

- Roading and access ways – plans, long-sections and typical cross-sections provided
- Road marking and signage shown
- Vehicle crossing [existing and proposed]

#### Engineering Roading

- Appropriate stormwater calculations including catchment plan
- Design catering for the upstream catchment
- Assessment of downstream stormwater capacity
- Overland flow location assessment and any proposed easements shown
- For 40 lot subdivisions or larger, or if pump station proposed indicate catchment plan area
- Assessment of catchment population in 50 years flow calculations
- Calculations with respect to adequacy of downstream system

#### Land Modification

- Earthworks showing existing and proposed contours
- Cut and fill areas defined on plan
- Quantity of cut/fill separately identified and shown on plan
- Proposed sediment control measures shown
- Has regional plan consent been obtained (required if over 1 ha, or over 0.25 ha and 15 and/or within 50m of stream or Wetland)
- Retaining walls identified and shown on plan and proposed construction methodology included

Office use only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

Attach **four** copies of any information identified in Form B in support of this application. This form and checklist is intended as a guide to help you to ensure that all the required information is submitted with your application. The level of information should be both relevant and appropriate to the scale of the proposal and reflected in your Assessment of Environmental Effects. This may require the need for Specialist(s) Reports.

Please ensure you complete this form in full and include with your application. **This form needs to be attached with Form A when submitting an application.** Delays in processing the application will occur if inadequate information is supplied.

This checklist is not exhaustive and you may be required to submit other information with your application. During the course of processing the application it may be identified that further information is required to continue with the assessment to enable a better understanding of the effects of the application.

## SECTION 1

### 1.0 GENERAL

**I have attached the following specialist(s) report(s)** (provide title, author and date in the space below).

Refer AEE

**I have attached plan(s) prepared in accordance with Guidance Note 1, Preparation of Plans.**

Site Plan showing the EXISTING situation on the subject site

Plan/s showing the PROPOSED Activity

Elevation Drawings of all buildings / structures to be built or altered

**And/or**

General Subdivision requirements (applicable to subdivision applications only)

**In addition to the guidance notes I have attached plans that identify the following.**

Position, drip line and identification of any protected trees, notable trees or stands of trees shown

- Any Protected species of trees — these are species identified which stand 6 metres or greater in height [see schedule 6C – Chapter 6, Operative District Plan]
- Any Notable trees or stands of trees [see schedule 6B – Chapter 6, Operative District Plan]

On-site pedestrian movement and vehicle manoeuvring shown Temporary and permanent access

Details of proposed signage including location and elevation(s) No signage proposed

Rubbish storage area shown

## SECTION 2

### 2.0 ALL APPLICATIONS

**Have the items on the Council's Land Information Register for the application site been addressed?**

Yes

No

**Has any Iwi consultation been undertaken?**

Yes

No

If yes, please provide appropriate details.

### Have you provided a full explanation and assessment of the application?

 Yes No

For example:

- The proposed use for the site and each building, hours of operation of the proposed activity
- The number of people employed and/or accommodated on the site
- The type and frequency of vehicle movements to and from the site
- Describe the types and methods of storage of materials on site
- Show the extent and describe the use of the balance of the property if proposal is a subdivision
- Provide a geotechnical investigation report/statement tailored to the specific site
- Identify and describe any hazardous substance(s) manufactured, stored, transported, used or disposed of from the site
- Describe the type, frequency and duration of any discharge of contaminants into the environment including odour, dust and noise
- The proposed methods for the treatment and or disposal of effluent, stormwater or any contaminant and the management of any stormwater overland flowpath
- The proposed extent of land modification [earthworks, including quantity of material], the location for disposal of excess soil, and the methods to manage soil erosion/situation from the site

### Does the subject site contain any recorded archaeological sites (see schedule 6A- Chapter 6, Manukau Operative District Plan) or involve a waahi tapu known to Council?

 Yes No

If yes, and the proposal will involve and/or potential the alteration of the archaeological site/waahi tapu then a Conservation Plan/Archaeological Assessment by a suitably qualified person may be required to be provided with the application.

### Is the subject site contaminated with chemicals that have been stored/sprayed previously on the site (e.g. formerly used for horticultural purposes, or industrial activities)?

 Yes No

If yes, a soil contamination assessment from a suitably qualified person may be required to be provided with the application. Refer AEE Part A Sec 9 and Part B

## SECTION 3

### 3.0 INFRASTRUCTURAL AND EARTHWORK REQUIREMENTS

#### Engineering Plans

- Manukau District Plan standard detail drawings appropriate to application  
*Existing infrastructure, proposed water courses, public cesspits, stormwater and wastewater pipes and water supply systems within and adjacent to the site.*
- Power, gas (where applicable), telephone services, land street lighting layout shown [existing and proposed]

#### Wastewater and Stormwater

- Connections shown for all proposed lots / units
- Long-sections and all required details shown
- Minimum depth of service connections shown [1.2m]
- Existing and proposed onsite stormwater and wastewater disposal detailed

#### Water Supply

- Water connections shown for all lots
- All proposed valves, hydrants, bends shown
- Pipe materials specified
- Ducted rider mains for six or more lots served off accessway
- Location and depth of water tank(s)

#### Roading

- Roothing and access ways – plans, long-sections and typical cross-sections provided
- Road marking and signage shown
- Vehicle crossing [existing and proposed]

#### Engineering Roothing

- Appropriate stormwater calculations including catchment plan
- Design catering for the upstream catchment
- Assessment of downstream stormwater capacity
- Overland flow location assessment and any proposed easements shown
- For 40 lot subdivisions or larger, or if pump station proposed indicate catchment plan area
- Assessment of catchment population in 50 years flow calculations
- Calculations with respect to adequacy of downstream system

#### Land Modification

- Earthworks showing existing and proposed contours
- Cut and fill areas defined on plan
- Quantity of cut/fill separately identified and shown on plan
- Proposed sediment control measures shown
- Has regional plan consent been obtained (required if over 1 ha, or over 0.25 ha and 15 and/or within 50m of stream or Wetland)
- Retaining walls identified and shown on plan and proposed construction methodology included

# Application for resource consent - trees



Property, Consents and Licensing  
Under section 88 of the Resource Management Act 1991  
Please send or deliver your application to the Council

Office Use Only:

Application No: \_\_\_\_\_

Receipt Date: \_\_\_\_\_

Deposit Paid: \_\_\_\_\_

It is important to complete this form and provide all necessary information as required  
in order to avoid delays in processing the application.

## 1.0 GENERAL DETAILS

Site to which this application relates is described as:

No:  Street:  Suburb:

Legal Description:

## 2.0 APPLICANT DETAILS

Name: (please write all names in full)

Physical Address:  Postcode:

Postal Address: (if different)  Postcode:

Telephone (day):  Mobile:  Fax:

Email:   Please tick if email preferred method of contact

The applicant is the

- Owner  Occupier  Lessee  Prospective Purchaser  The Crown  Network Utility Operator  Other

of the site to which the application relates.

## 3.0 AGENT/CONSULTANT DETAILS (If different from above)

Company:  Contact Person:

Postal Address of agent:  Postcode:

Telephone (day):  Mobile:  Fax:

Email:   Please tick if email preferred method of contact

#### 4.0 ADDRESS FOR CORRESPONDENCE AND INVOICES (Only Applicable to Franklin District Plan applications)

All correspondence (excluding invoices) sent to:

<input checked="" type="checkbox"/> Applicant	<input type="checkbox"/> Agent/Consultant	<input type="checkbox"/> Other _____
---	---	--------------------------------------

Invoices sent to:

<input checked="" type="checkbox"/> Applicant	<input type="checkbox"/> Agent/Consultant	<input type="checkbox"/> Other _____
---	---	--------------------------------------

#### 5.0 RELEVANT DISTRICT PLANS

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Auckland Central | <input type="checkbox"/> Auckland Gulf Islands | <input type="checkbox"/> Auckland Isthmus |
| <input type="checkbox"/> Franklin         | <input checked="" type="checkbox"/> Manukau    | <input type="checkbox"/> North Shore      |
| <input type="checkbox"/> Papakura         | <input type="checkbox"/> Rodney                | <input type="checkbox"/> Waitakere        |

#### 6.0 DESCRIPTION OF PROPOSED ACTIVITY

- Removal                       Pruning/Trimming                       Works within Dripline  
 Works within rootzone (applicable to Manukau and North Shore District Plan only)

Does the work involve:

- A privately owned tree                       A Council owned tree (*please attach landowner approval*)  
 Scheduled tree                       Development of property

Describe Proposed Tree Works (including any mitigation measures, e.g. replanting):

Tree removal, works within the dripline and rootzone of Council owned trees in Kiwi Esplanade Reserve, and within the road reserve on Yorkton Rise, Muir Ave and Witla Court, Mangere Bridge.

#### 7.0 PRE APPLICATION INFORMATION

Have you received pre-application information or had a pre-application meeting regarding this proposal from the Council?

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Copy of meeting minutes attached	Date of meeting: _____
---	-----------------------------	---	------------------------

If YES, provide the reference number and/or name of staff members(s):

Drafts of Central Interceptor reports have been reviewed by Council.
--

#### 8.0 SITE VISIT REQUIREMENTS

- As landowner, and with the consent of any occupiers or lessees, I agree to council staff or authorised consultants visiting the site, which is the subject of this application, for the purpose of assessing this application:

Landowner's full name: \_\_\_\_\_

Landowner's signature: \_\_\_\_\_

Date Signed: \_\_\_\_\_

OR

- If applicant is not the landowner:

Person authorised to sign on behalf of Landowner: \_\_\_\_\_

Authorising person's signature: \_\_\_\_\_

Date Signed: \_\_\_\_\_

Is there a locked gate or security system restricting access by council staff?

<input type="checkbox"/> Yes	<input type="checkbox"/> No
------------------------------	-----------------------------

## 8.0 SITE VISIT REQUIREMENTS contd

Do you have a dog on the property?

Yes

No

Provide details of any entry restrictions that council staff should be aware of; e.g. health and safety, organic farm etc

N/A

## 9.0 NOTIFICATION OF THE APPLICATION

Are you requesting the application to be publicly notified. overall CI application

Yes

No

Are you requesting the application to be notified to any persons who you consider are likely to be adversely affected by your proposal "if the activity's adverse effects on the person are minor or and have not provided their written approval. (Please note it is at the discretion of council if an application should be limited notified)

Yes

No

If yes to either of the above, please provide an executive summary of your application for notification purposes.

## 10.0 INFORMATION TO BE SUBMITTED WITH THE APPLICATION

To satisfy the requirements of section 88(2) of the Resource Management Act 1991 (RMA), please attach the following information. If inadequate information is supplied with your application, this will cause delays in processing or may result in the application being returned pursuant to section 88(3) of the RMA. **Two** copies (including one unbound) of all information is required.

**A completed, signed application form including authorisation for site inspection and signed and dated by persons responsible for payment of fees and charges.**

**I attach any information required to be included in this application by the district plan, the Resource Management Act 1991 or any regulations made under that Act.**

**Two copies (including one unbound) of the relevant information.**

**Certificates of Title less than 3 months old for the subject site.**

**Attach the title and any relevant consent notices, covenants, easements attached to the title if relevant or impacted by the proposed activity.**

**In accordance with Schedule 4 of the RMA, an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that the proposed activity may have on the environment.**

This should include a full description of the proposed activity, the effects that may be generated and how these would be managed. Any consultation undertaken needs to be identified if any, and any response to any person consulted shall be identified. This may require Specialist(s) Report to be provided. *For more information, see the Fourth Schedule of the Resource Management Act.*

- The type, height, girth and name of the tree species.
- The contribution of the tree(s) to the neighbourhood, both visually and physically, and its role as a habitat for birds and other animals.
- Function of the tree in soil and water conservation.
- Whether removal would be beneficial to surrounding vegetation.
- Whether the tree may be structurally unsound.
- Any tree protection measures, relocation and/or replacement planting.

**I attach the following Specialist Report(s) e.g. Arboricultural (provide title, author and date in the space below).**

Arboricultural Report

## 11.0 SITE PLAN

Please provide a sketch of the proposal and clearly identify the number, species and location of each tree subject to the application, the proposed work and the location of all buildings and specific features (where relevant) on the site:

Please see drawing AEE-MAIN-9.2 attached to the application documents and Arboricultural Report.



**12.0 DEPOSIT FEES (Only Applicable to Franklin District Plan applications)**

The required deposit must be paid before any processing of the application will start.

I enclose a deposit fee of  for the processing of this application. I/we understand that Council may invoice me for the actual and reasonable costs incurred in the processing of this application.\*

**5.0 13.0 DECLARATION CONCERNING PAYMENT OF FEES (Only Applicable to Franklin District Plan applications)**

I/we understand that the Council may charge me/us for all costs actually and reasonably incurred in processing this application. Subject to my/our rights under sections 357B and 358 of the RMA to object to any costs, I/we undertake to pay all processing costs incurred by the Council. Without limiting the Council's legal rights, if any steps, including the use of debt collectors, are necessary to recover unpaid processing costs, I/we agree to pay all costs of recovering those processing costs. If this application is made on behalf of a trust (private or family), a society (incorporated or unincorporated) or a company, in signing this application I/we are binding the trust, society or company to pay all the above costs and guaranteeing to pay all the above costs in my/our personal capacity

Full name:  Signature:   
Date:

**14.0 SIGNATURE OF APPLICANT**

Full name:  Signature:   
Date:   
Full name:  Signature:   
Date:

**PRIVACY INFORMATION**  
The information you have provided on this form is required so that your application can be processed under the RMA, so that statistics can be collected by the Council. The information will be stored on a public register, and held by the Council. The details may also be made available to the public on the Council's website. These details are collected to inform the general public and community groups about all consents which have been issued through the Council. If you would like to request access to, or correction of your details, please contact the Council.

\* Refer to Fees and Charges Schedule



## Appendix B – Objectives and Policies Assessment



## Appendix B: Objectives and policies assessment

### 1.0 Auckland Council Regional Policy Statement

Auckland Council Regional Policy Statement		
Reference	Objective/Policy	Comment
Strategic Objective 2.6.1	To ensure that provision is made to accommodate the Region's growth in a manner which gives effect to the purposes and principles of the Resource Management Act 1991 and Section 40 of the Local Government (Auckland) Amendment Act 2004, and is consistent with these Strategic objectives and with the provisions of this RPS.	The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the ARPS and Auckland Plan by providing for growth within the urban limits.
Strategic Objective 2.6.2	To maintain and enhance the overall quality of the environment of the Auckland Region, within and outside the urban area, including its unique maritime setting, volcanic features, significant landscapes, cultural and natural heritage values, and public open space.	The project will enhance the quality of the environment through the reduction of wastewater overflows within the urban area. Effects on public open space and landscapes will be of a temporary nature during construction.
Strategic Objective 2.6.10	To preserve the natural character of the coastal environment, whilst ensuring that the use of the coastal environment by those industries and activities which serve the needs of the Region and which depend on a coastal location is appropriate and efficient.	The only above ground works in the coastal environment are at the PS 23 (Frederick St) site and at the Mangere Pump Station site. The project will provide important regionally significant infrastructure that will help provide for the wellbeing of the whole community. Measures will be incorporated in the design to help integrate the permanent features into the setting. The infrastructure has a functional need to locate in the CMA in order to connect the network between the Auckland Isthmus and the Mangere WWTP.
Strategic Objective 2.6.17	To enable the redevelopment, operation and maintenance of existing and provision of new regionally significant infrastructure.	The project will provide important regionally significant infrastructure that will help provide for the wellbeing of the whole community.
Strategic Policy Infrastructure 2.6.14.1	The operation of existing regionally significant infrastructure and the provision of new or upgraded regionally significant infrastructure shall: (i) be consistent with the Strategic Direction of the Regional Policy Statement; and (ii) support and reinforce the Regional Growth Strategy and the proposed outcomes of that strategy; (iii) ensure that any adverse effects of those activities on the environment (including human health) are	The project will provide important regionally significant infrastructure that will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the ARPS and Auckland Plan by providing for growth within the urban limits.

Auckland Council Regional Policy Statement		
Reference	Objective/Policy	Comment
	avoided, remedied or mitigated in a manner consistent with the relevant provisions of this RPS.	A number of measures are proposed to avoid, remedy and mitigate the effects of construction on the environment as described throughout the AEE.
Strategic Policy Infrastructure 2.6.14.2	Provision is to be made to enable the safe and efficient operation, maintenance and development of regionally significant infrastructure which is necessary for the social and economic wellbeing of the region's people;	The project will provide important regionally significant infrastructure that will help provide for the wellbeing of the whole community.
Strategic Policy Infrastructure 2.6.14.5	<p>In the operation of existing regionally significant infrastructure and the provision of new infrastructure consideration and appropriate provision is to be made for the following matters;</p> <p>(a) The avoidance of significant adverse effects (including cumulative adverse effects) on:</p> <ul style="list-style-type: none"> <li>• the environmental values protected by defined limits to metropolitan Auckland and defined limits of rural or coastal settlements;</li> <li>• significant and outstanding coastal and natural landscapes, vegetation and fauna areas;</li> <li>• amenity values throughout the whole of the region and the rural character of rural areas in the Region;</li> <li>• human health</li> </ul> <p>Where significant adverse effects cannot be avoided they shall be remedied or mitigated;</p> <p>(b) Avoiding prematurely foreclosing, or compromising options for future urban and rural and coastal town growth including areas identified in Schedule 1;</p> <p>(c) Consideration of alternative locations (including locations in urban areas) for utility service facilities which give rise to significant adverse effects on the environment;</p> <p>(d) Environmental enhancement and/or remediation opportunities.</p>	The works have been designed and alternatives considered to avoid significant adverse effects (including cumulative adverse effects). Construction works will result in some effects of a more than minor nature, however these will be temporary and site reinstatement works will seek to mitigate ongoing effects.
Objective 3.3.1	To sustain the mauri of natural and physical resources in ways which enable provision for the social, economic and cultural wellbeing of Maori.	The project will assist in sustaining and the restoration of the mauri of natural and physical resources by reducing wastewater overflows to the environment.
Objective 3.3.3	<p>To involve Tangata Whenua in resource management processes in ways which:</p> <p>(i) take into account the principles of the Treaty of Waitangi, including rangatiratanga;</p> <p>(ii) have particular regard to the practical expression of kaitiakitanga.</p>	As part of the consultation process Watercare is involving and consulting with iwi groups who may have mana whenua interests over the works area.



<b>Auckland Council Regional Policy Statement</b>		
<b>Reference</b>	<b>Objective/Policy</b>	<b>Comment</b>
Policy 3.4.1	Waahi tapu and other ancestral taonga of special value to Tangata Whenua shall, where agreed by Tangata Whenua, be identified, evaluated, recognised and provided for in accordance with tikanga Maori, and given an appropriate level of protection.	Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Initial issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.
Policy 3.4.10	The management of natural and physical resources shall take into account the effects on relevant Treaty claims and/or customary rights of Tangata Whenua.	
Objective 6.3.3	To protect and restore ecosystems and other heritage resources, whose heritage value and/or viability is threatened.	The works at Kiwi Esplanade will be managed to minimise effects on shore birds using this area as habitat. The potentially most disruptive works (e.g. trenching) will be timed, where practicable, to occur when shore bird numbers are at their lowest. The effects on birds at this site are expected to be no more than minor.
Objective 6.3.5	To maintain the overall quality and diversity of character and sense of place of the landscapes of the Auckland Region.	The coastal edge around Hillsborough Bay is identified as a Regionally Significant Landscape (Rating 5). There is somewhat of a break in the cliffline vegetation at the PS 23 site, although some vegetation removal will be required. Mitigation measures, such as replanting, and the use of appropriate design and treatment of permanent features at the site are proposed to minimise effects on this landscape.
Objective 6.3.7	To protect and where practicable enhance the visual and physical integrity and values of the volcanic features of the Auckland Region of local, regional, national and/or international significance including social, cultural, historical, geological, archaeological, scientific, ecological, amenity, iwi, open space and landscape values.	The main tunnel will pass beneath the Mangere Lagoon and the Manukau foreshore lava flows. The tunnel will pass beneath the basalt and will not adversely affect geological heritage features.



Auckland Council Regional Policy Statement		
Reference	Objective/Policy	Comment
Policy 6.4.1.2	The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga shall be recognised and provided for in the preservation or protection of the heritage resources of the Auckland Region.	Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.
Policy 6.4.1.3	<p>The subdivision of land, and use and development of natural and physical resources shall be controlled in such a manner that:</p> <p>(i) the values of heritage resources of international, national or regional significance are preserved or protected from significant adverse effects.</p> <p>(ii) where preservation or protection and avoidance of significant adverse effects on the values of such significant heritage resources is not practicably achievable, such significant adverse effects shall be remedied, or mitigated.</p> <p>(iii) In the context of this Policy, significant adverse effects would include:</p> <ul style="list-style-type: none"> <li>• the destruction of the state and physical integrity of significant heritage resources or of a significant physical or biological process to the level where the maintenance of that process cannot be assured;</li> <li>• the destruction of or significant reduction in the educational, scientific or amenity value of a significant heritage resources, or of that heritage feature's contribution to significant natural character and landscape values;</li> <li>• the fragmentation of significant connections of indigenous vegetation between significant ecosystems;</li> <li>• the loss of a threatened or protected species;</li> <li>• a significant reduction in the abundance or natural diversity of significant indigenous flora and fauna;</li> <li>• a significant reduction in the value of the historical, cultural and spiritual association with significant heritage resources which are held by Tangata Whenua and the wider community;</li> <li>• a significant reduction in the value of significant heritage resources in their wider historical, cultural, and landscape contexts;</li> <li>• the loss of significant historic places, areas and waahi tapu;</li> <li>• a significant modification of the viability or value of significant heritage resources as a result of the use or development of other land in the vicinity of the heritage resource.</li> </ul>	<p>The main tunnel will pass beneath the Mangere Lagoon and the Manukau foreshore lava flows. The tunnel will pass beneath the basalt and will not adversely affect geological heritage features (therefore there will be no significant adverse effects).</p> <p>The works at Kiwi Esplanade will be managed to minimise effects on shore birds using this area as habitat. The potentially most disruptive works (e.g. trenching) will be timed, where practicable, to occur when shore bird numbers are at their lowest. The effects on birds at this site are expected to be no more than minor.</p>

Auckland Council Regional Policy Statement		
Reference	Objective/Policy	Comment
Policy 6.4.19.1	The volcanic features of the Auckland Region of local, regional, national and/or international significance shall be managed in an integrated manner to protect their multiple values, including social, cultural, historical, geological, archaeological, scientific, ecological, amenity, open space and landscape values and to maintain the range and diversity of volcanic features within the context of the wider Auckland and Franklin volcanic fields.	The main tunnel will pass beneath the Mangere Lagoon and the Manukau foreshore lava flows. The tunnel will pass beneath the basalt and will not adversely affect geological heritage features.
Policy 6.4.19.2	The physical and visual integrity and values of Regionally Significant Volcanic Features shall be protected by: (i) avoiding activities within the boundaries of the Regionally Significant Volcanic Features shown on Map Series 2a that individually or cumulatively: (a) result in significant modification or destruction of the feature; or (b) detract physically or visually from the values of the feature; and (ii) ensuring that, where publicly owned, their open space and amenity values are maintained and where practicable enhanced and that the provision of public access and recreation is consistent with the protection of their other values; and (iii) ensuring activities on land surrounding or adjacent to the Regionally Significant Volcanic Features shown in Map Series 2a, or those parts of the volcanic feature described in Appendix B but not shown on Map Series 2a are managed so that significant adverse effects on the values of the features are avoided, remedied or mitigated, and where practicable the values are enhanced.	The main tunnel will pass beneath the Mangere Lagoon and the Manukau foreshore lava flows. The tunnel will pass beneath the basalt and will not adversely affect geological heritage features. The works will not give rise to the effects listed in (i) to (iii).
Policy 6.4.19.4	The views of volcanic cones that are listed in Appendix L and indicated on Map Series 4a, shall be protected, and intrusion into the defined viewshafts by buildings or structures shall be avoided, except where provided for by specified building heights in Height Sensitive Areas that underlie the viewshafts and are detailed in the district plan and depicted for information purposes in Map Series 4a.	The sites at Haverstock Road and Walmsley Park are within the view shaft for Mt Albert. However, the permanent structures at these sites will only comprise of covers, at ground level.
Objective 7.3.1	To preserve the natural character of the coastal environment and to protect it from inappropriate subdivision, use and development.	The tunnel will be well below ground and the only above ground works in the coastal environment are at the PS 23 site off Frederick St in Hillsborough and at the Mangere Pump Station site. The project will provide regionally significant infrastructure that will
Objective 7.3.3	To enable appropriate subdivision, use and development to be undertaken in the coastal environment.	
Objective	To enable the use of the coastal environment for appropriate port purposes, other water-related	

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Reference	Objective/Policy	Comment
7.3.4	industrial and commercial activities and network utilities.	<p>help provide for the wellbeing of the whole community. Measures will be incorporated in the design to help integrate the permanent features into the setting.</p> <p>The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</p> <p>The proposed works involve the use of the coastal environment for a network utility. The project will provide regionally significant infrastructure that is required to support population growth and that will help provide for the wellbeing of the whole community.</p>
Objective 7.3.6	To maintain and enhance public access to and along the CMA and to publicly-owned land in the coastal environment.	<p>The proposed works in the vicinity of PS 23 (Frederick Street) will only affect a small area and access will still be available around the site at low tide.</p> <p>At Mangere Pump Station it will be necessary to restrict public access to the coastal walkway for a short period, but other walkways in the area will remain open.</p>
Objective 7.3.9	To recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga of the coastal environment.	As part of the consultation process Watercare is involving and consulting with iwi groups who may have mana whenua interests over the works area.
Policy 7.4.4.1	<p>The natural character of the coastal environment shall be preserved, and protected from inappropriate subdivision, use and development by:</p> <p>(i) In areas of high natural character, avoiding adverse effects on:</p> <ul style="list-style-type: none"> <li>(a) the natural functioning and natural processes of sediment transport, substrate composition and movement of biota;</li> <li>(b) areas of indigenous vegetation and habitats of indigenous fauna and associated processes;</li> <li>(c) the physical integrity of coastal landforms and geological features and associated natural processes;</li> <li>(d) features, elements and patterns which contribute to landscape value and scenic and</li> </ul>	<p>The tunnel will be below ground/seabed and is therefore not expected to have effects of the nature of those listed in this policy.</p> <p>The only above ground works in the coastal environment are at the PS 23 site off Frederick St in Hillsborough and at the Mangere Pump Station site. These are modified environments and not of high natural character. There will be some effect on natural character at PS 23, largely due to the removal of vegetation.</p> <p>The works will not result in a significant reduction in habitat. Mitigation measures include</p>

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	<p>visual value;</p> <p>(e) natural features, sites and natural areas of historic, aesthetic, cultural or spiritual value;</p> <p>(f) water or air quality;</p> <p>(g) habitat important for preserving the range, abundance and diversity of indigenous and migratory coastal species;</p> <p>(h) habitat important for breeding and feeding of coastal species;</p> <p>(i) the healthy functioning of estuaries, coastal wetlands, mangroves, dunes, sand spits and their margins.</p> <p>(ii) In all other areas, avoiding any adverse effects which result in the significant reduction in habitat important for preserving the range and diversity of indigenous and migratory coastal species within the Auckland Region.</p> <p>In the context of Policy 7.4.4-1 (i) and (ii), adverse effects to be avoided include those listed in Chapter 6 – Heritage, Policy 6.4.1.</p> <p>(iii) In areas which are not of high natural character, avoiding where practicable or remedying, or mitigating the adverse effects of subdivision, use and development on the elements of natural character outlined in Policy 7.4.4-1 (i) (a) – (i) except those adverse effects which are to be avoided in 7.4.4-1 (ii) above.</p>	<p>replanting and incorporating measures into the detailed design, e.g. the use of recessive materials, to minimise visual effects. The temporary construction platform will be removed on completion of construction works. Erosion and sediment control measures will be used to minimise water quality effects. Overall the project will result in water quality improvements through the reduction in wastewater overflows.</p>
Policy 7.4.4.2	Where appropriate, the natural character of the coastal environment shall be restored and rehabilitated.	At PS 23 (Frederick Street) the temporary construction platform will be removed. Replanting will also be undertaken to mitigate the effects of the proposed works.
Policy 7.4.7.1	Areas of significant indigenous vegetation, significant habitats of indigenous fauna, significant landforms and geological features, and significant places or areas of historic or cultural significance in the coastal environment shall be preserved and protected by avoiding, remedying, or mitigating the adverse effects of subdivision, use and development in a manner consistent with Policies 6.4.1-3 and 7.4.4-1 (i), (ii) and (iii).	<p>ARPS Appendix B and Map 2 Sheet 2 identify the foreshore and shoreline area from Mangere Bridge westward along Kiwi Esplanade as an important roosting area for seabirds and wading birds.</p> <p>The tunnel will pass below this area at depth and is not expected to adversely affect this habitat. The surface works on the reserve at Kiwi Esplanade will occupy a relatively small area of a wider area of grassed habitat and adverse effects on birds at this site are likely to be minor.</p>
Policy 7.4.7.3	Outstanding and Regionally Significant Landscapes in	The coastal edge around

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	the coastal environment shall be preserved and protected in accordance with Policy 6.4.19-1.	Hillsborough Bay is identified as a Regionally Significant Landscape (Rating 5). There is somewhat of a break in the cliffline vegetation at the PS 23 site, although some vegetation removal will be required. Mitigation measures, such as replanting, and the use of appropriate design and treatment of permanent features at the site are proposed to minimise effects on this landscape.
Policy 7.4.7.6	Characteristics of the coastal environment of special value to Tangata Whenua, including waahi tapu, urupa, tauranga waka, mahinga mataitai and taonga raranga, shall be managed in accordance with the objectives and policies of Chapter 3 – Matters of Significance to Iwi.	Watercare is currently going through a process of engagement that will help to identify any potential effects of the project on tangata whenua or cultural heritage matters.
Policy 7.4.10.2	<p>In assessing the appropriateness of subdivision, use and development in the coastal environment particular regard shall be had to the following matters:</p> <p>(i) natural character is preserved and protected in accordance with Policies 7.4.4-1 (i), (ii) and (iii), and 7.4.4-2;</p> <p>(ii) public access is maintained or enhanced in accordance with Policies 7.4.13-1, 2 and 3;</p> <p>(iii) amenity values are maintained or enhanced as far as practicable;</p> <p>(iv) public open space is maintained or enhanced as far as practicable;</p> <p>(v) there is a functional need for use and development within the CMA;</p> <p>(vi) efficient use is made of the natural and physical resources of the coastal environment;</p> <p>(vii) activities are of a scale, design and location that maintain or enhance landscape values in the area, including seascapes and landforms;</p> <p>(viii) there are no significant adverse effects of activities on the CMA, or on adjacent land, including effects across the MHWS boundary;</p> <p>(ix) adverse effects are avoided, remedied or mitigated in Areas of Special Value in accordance with policies in 7.4.7;</p> <p>(x) activities are designed and located to avoid the need for hazard protection works;</p> <p>(xi) provision is made for adequate utility services (including the disposal of waste);</p> <p>(xii) effect is given to all other relevant provisions of</p>	<p>(i) refer above</p> <p>(ii) The temporary construction platform at PS 23 (Hillsborough Bay) will affect only a small area and will not interfere with any existing public walkways. Access will still be available along the foreshore at low tides.</p> <p>(iii) Measures will be incorporated in the design of the permanent features at PS 23 to help integrate the features into the setting and maintain amenity values.</p> <p>(iv) The construction works at Kiwi Esplanade will occupy an area of public open space but in the long term the area will be enhanced through the provision of a new toilet facility.</p> <p>(v) The infrastructure has a functional need to locate in the CMA in order to connect the network.</p> <p>(vi) Works within the coastal environment are limited in scale and consideration has been given to the site layout and efficient use of space at the PS 23 site.</p> <p>(vii) With appropriate design and treatment of the permanent features at the PS 23 site it is</p>

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	this policy statement, in particular those stated in Chapter 2 – Regional Overview and Strategic Direction, Chapter 6 – Heritage and Chapter 8 – Water Quality.	<p>considered that there would be minor permanent adverse effects on open space and landscape character.</p> <p>(viii) Significant adverse effects on the CMA are not anticipated.</p> <p>(ix) As above (7.4.7).</p> <p>(x) On completion of construction the temporary construction platform will be removed and the coastal edge reinstated with basalt rock or similar.</p> <p>(xi) not applicable.</p> <p>(xii) refer relevant objectives and policies above and below.</p>
Policy 7.4.10.4	Applications to reclaim part of the CMA, extract sand, shell and other natural material and rights to occupy the CMA shall have regard to any available alternatives to the proposal, which would avoid these activities.	Alternative layouts have been considered for the PS 23 site, but given the space constraints at the site, the proposed layout, involving a limited area for a temporary construction platform was selected in order to provide sufficient space for construction.
Policy 7.4.10.8	Appropriate subdivision, use and development shall be encouraged to locate in areas where the natural character has already been compromised, thereby avoiding sprawling or sporadic subdivision, use and development in the coastal environment.	<p>The existing landscape within which the works are located is generally a highly modified environment. The landscape is an urban one that has largely been modified through development over time.</p> <p>The proposed works are located in modified environments and not in an area of high natural character.</p>
Policy 7.4.10.9	Notwithstanding Policy 7.4.10-8, regard shall be had to the protection of those elements of remaining natural character which continue to exist in areas where human modifications or activities predominate.	There are expected to be temporary adverse effects on natural character at PS 23, largely due to the removal of vegetation, but these effects will be mitigated through replanting.
Policy 7.4.13.1	Public access shall be maintained and enhanced to and along the CMA and to publicly owned land in the coastal environment.	<p>The proposed works in the vicinity of PS 23 (Frederick Street) will only affect a small area and access will still be available around the site at low tide.</p> <p>At Mangere Pump Station it will be necessary to restrict public access to the coastal walkway for a short period, but other walkways in the</p>



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		area will remain open.
Policy 8.4.7.1	All new developments discharging stormwater, whether allowed as a permitted activity or by a resource consent, shall adopt appropriate methods to avoid or mitigate the adverse effects of urban stormwater runoff on aquatic receiving environments.	While the impervious area threshold will be exceeded by permanent works at six sites, the surfaces will be subject to low vehicle traffic and there will be limited sources of contaminants. Appropriate devices meeting TP 10 requirements will be provided.  During construction, stormwater will be managed using devices generally in accordance with TP 90 and/or TP 10 as appropriate for the site. Indicative measures are shown in Part D Technical Report K.
Policy 8.4.7.3	All land disturbance activities which may result in elevated levels of sediment discharge shall be carried out so that the adverse effects of such discharges are avoided, remedied, or mitigated.	Erosion and sediment control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Part D Technical Report K.



## 2. Auckland Council Regional Plan: Air, Land and Water

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Reference	Objective/Policy	Comment
Objective 2.1.3.2	To preserve the natural character of wetlands, lakes and rivers and their margins by protecting them from inappropriate use and development.	The proposed works will result in improvements in watercourses through the reduction of wastewater overflows.  Works undertaken in proximity to watercourses will be managed so as to avoid remedy or mitigate adverse effects, such as through the use of erosion and sediment control measures.
Objective 2.1.3.4	To maintain and enhance the quality of the Region's Permanent rivers and streams where practicable.	
Policy 2.1.4.1	The natural character of wetlands, lakes and rivers and their margins shall be preserved and protected from inappropriate use and development by avoiding, remedying or mitigating adverse effects on the qualities, elements and features that contribute to the natural character of these areas.	
Policy 2.1.4.9	<p>In assessing the effects of use and development on natural character and terrestrial and aquatic ecosystems in terms of Policies 2.1.4.1 to 2.1.4.8, regard shall be had to maintaining and where practicable enhancing the matters listed in clauses (a) to (n) below, or preventing or minimising the adverse effects of any discharge of contaminants where a Best Practicable Option approach is used, where these are relevant:</p> <p>(a) The physical or ecological integrity of the ecosystem and the continuation of the physical, biological or chemical processes necessary to ensure its proper functioning;</p> <p>(b) Vegetation patterns (ecotones) and connections between habitats;</p> <p>(c) Riparian vegetation bordering lakes, rivers and wetlands;</p> <p>(d) Natural biodiversity, productivity and biotic patterns;</p> <p>(e) Access, migratory and dispersal pathways for terrestrial and aquatic fauna;</p> <p>(f) The physical characteristics of the lake or wetland, including its shape, size and natural substrate composition;</p> <p>(g) The physical characteristics of a stream channel, including dimension (width, depth), pattern (meander wavelength) and profile (slope);</p> <p>(h) Aquatic habitat structure, including in the case of rivers and streams, pools, riffles and runs;</p> <p>(i) Flow regimes, water levels and hydraulic processes of a wetland, lake or river;</p> <p>(j) The natural sediment processes in a river channel, including bank erosion, sediment transport and sediment deposition;</p> <p>(k) The natural substrate composition in lakes, rivers and wetlands, by:</p> <p style="padding-left: 40px;">i avoiding the addition of material not found naturally in the area;</p>	

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Reference	Objective/Policy	Comment
	<ul style="list-style-type: none"> <li>ii maintaining natural processes of erosion, movement and deposition of substrate;</li> <li>iii avoiding disturbance and deposition that could have significant or irreversible effects on substrate composition;</li> </ul> <p>(l) The physical characteristics of the floodplain of a stream or river;</p> <p>(m) Water and air quality necessary to protect human and ecological health.</p> <p>(n) The significance of the ecosystem, having regard to:</p> <ul style="list-style-type: none"> <li>i whether it is listed in the Schedules of this plan;</li> <li>ii whether it is identified in Appendix B of the Auckland Regional Policy Statement, the Department of Conservation's Auckland Conservation Management Strategy or as a significant area in any district plan;</li> <li>iii whether it has been identified in any published Protected Natural Area report;</li> <li>iv whether it is the habitat of any nationally or regionally threatened rare or endangered species.</li> </ul>	
Objective 2.2.3.1	To enable appropriate use and development of air, land and freshwater resources, while recognising the characteristics, constraints and availability of these resources.	The proposed works involve the appropriate use and development of air, land and freshwater resources in order to provide important infrastructure that will provide for the needs of the community. The proposed works incorporate measures to avoid, remedy or mitigate adverse effects arising from construction.
Objective 2.2.3.2	To manage the use and development of natural and physical resources in a sustainable, efficient and integrated manner that is consistent with the strategic growth management provisions of the Auckland Regional Policy Statement and the Auckland Regional Growth Strategy.	The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the ARPS by providing for growth within the urban limits.
Objective 2.2.3.3	To enable the use and development of air, land and water in a way that provides for the efficient use of land and supports increased urban densities within the Urban Areas.	The proposed works
Objective 2.2.3.4	To provide for the ongoing operation, maintenance, development and upgrading of physical infrastructure, in a manner that meets regional growth requirements and supports the economic, social and cultural wellbeing of the Region's people and communities and provides for their health and safety, while avoiding, remedying or mitigating	incorporate measures to avoid, remedy or mitigate adverse effects arising from construction.

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Reference	Objective/Policy	Comment
	adverse effects on the environment.	
Objective 2.2.3.7	To maintain and where practicable to enhance the quality and amenity values of Auckland's air, land and freshwater resources.	The proposed works will result in improvements, particularly in Meola Creek, and its coastal receiving environment through the reduction of wastewater overflows.
Policy 2.2.4.1	Use and development of air, land and water within Urban Areas (the Metropolitan Urban Limits and rural and coastal settlements) is appropriate where: (a) it is consistent with the strategic directions of the Auckland Regional Policy Statement and the Auckland Regional Growth Strategy; and (b) adverse effects are avoided, remedied or mitigated.	The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the ARPS and Auckland Plan by providing for growth within the urban limits.
Policy 2.2.4.4	The use, development, upgrading or maintenance of network utility infrastructure shall be considered appropriate where: (a) it is consistent with the strategic directions of the Auckland Regional Policy Statement; or (b) it is consistent with the Auckland Regional Growth Strategy; or (c) it is to improve environmental outcomes that result from the operation of this infrastructure; or (d) it is undertaken in an efficient and cost effective manner that recognises the community's ability to pay; and (e) significant adverse effects on natural and physical resources are avoided, remedied or mitigated.	The proposed works incorporate measures to avoid, remedy or mitigate adverse effects arising from construction.  The proposed works will result in improvements, particularly in Meola Creek, and its coastal receiving environment through the reduction of wastewater overflows.
Policy 2.2.4.8	The positive social, economic and cultural effects and benefits arising from any proposal for use and development shall be considered when assessing the overall effects of a proposal on air, land or water resources.	The proposed works will have positive effects through providing additional network capacity for growth and development, providing asset security through the duplication of the lower section of the ageing Western Interceptor, and reducing wastewater overflows into Meola Creek and the Waitemata Harbour, and providing the opportunity for further overflow reduction, such as through the construction of the CSO Collector network.
Policy 2.2.4.11	Proposals to use or develop air, land or freshwater resources shall have regard to: (a) The relevant provisions of the Auckland Regional Policy Statement; (b) The relevant provisions of the Auckland Regional Plan:	These provisions have been taken into account throughout the AEE and in this assessment.

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	Coastal where the proposal may directly affect the coastal marine area; (c) The relationship between the use of air, land and freshwater and the provisions of district plans and other relevant resource management strategies.	
Policy 2.2.4.12	Use and development shall be undertaken at times of the day, week or year which will avoid, remedy or mitigate adverse effects on: (a) The growth and reproduction of terrestrial and aquatic vegetation and the feeding, breeding and migratory patterns of fauna, including bird roosting, nesting and feeding; and/or (b) Lawful recreational use of air, land and freshwater bodies; and/or (c) Other lawful established activities in the locality that are likely to be adversely affected by any proposal.	To minimise effects on shore birds at Kiwi Esplanade, the most disruptive construction activities will be timed, to the extent practicable, to occur when shore bird numbers are at their lowest (August to December). Works in the CMA at Mangere Pump Station will be timed as far as possible to be carried out at low tide.
Policy 2.2.4.13	In assessing applications for use and development, particular regard shall be had to the maintenance and enhancement of amenity values, including any effects on recreational use of air, land and water bodies.	The proposed wastewater pipes will not impinge on any recreational use of existing water systems. The pipes will be laid beneath the surface and the land above will be reinstated following completion of the works.
Policy 2.2.4.16	Use and development of, air, land and freshwater shall consider any effects on sites, buildings, places or areas which have cultural heritage values and which are identified in the ARC's Cultural Heritage Inventory, and should avoid, remedy or mitigate, adverse effects on these resources.	Effects on cultural heritage and archaeology have been considered and the project is not expected to affect any sites on the CHI.
Objective 2.3.3.1	To sustain the mauri of natural and physical resources in ways which enable provision for the social, economic and cultural wellbeing of Māori.	The project will assist in the restoration of the mauri of natural and physical resources by reducing wastewater overflows to the environment.
Objective 2.3.3.3	To involve tangata whenua in resource management processes in ways which: (a) Take into account the principles of the Treaty of Waitangi, including rangatiratanga; (b) Have particular regard to the practical expression of kaitiakitanga.	As part of the consultation process Watercare is involving and consulting with iwi groups who may have mana whenua interests over the works area.
Policy 2.3.4.1	Sites and areas of special value to tangata whenua identified in – (a) Schedule 8 of this Plan; or (b) Appendix B of the Auckland Regional Policy Statement; or	The alignment and depth of the tunnel are such that it avoids volcanic cones and no known archaeological sites will be affected.

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	(c) A district plan – shall be protected from inappropriate use and development that would cause adverse effects on the qualities, elements and features which contribute to the values of these sites and areas.	Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Initial issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.
Policy 2.3.4.2	Sites and areas of special value to tangata whenua, which are not identified in accordance with Policy 2.3.4.1, shall be managed by avoiding where practicable, remedying or mitigating adverse effects on the qualities, elements and features which contribute to the values of these sites and areas, having regard to:  (a) The significance of the site or area, taking into account: i Whether it is identified in any relevant iwi planning document, recognised by an Iwi Authority; ii Whether it is identified in the Auckland Conservation Management Strategy; iii Whether it has been identified as being significant in any published archaeological or heritage report; iv Whether it is identified as being significant by tangata whenua during consultation.  (b) Whether any disturbance or modification would have significant or irreversible effects on the physical or cultural integrity of the site or area;  (c) Whether the proposal will protect or enhance the cultural heritage, scientific, or amenity values of the site or area.  (d) Physical or visual connections with other heritage sites or areas.	
Policy 2.3.4.4	Regional rules and decisions on resource consents which may affect matters of significance to tangata whenua, shall take into account the following:  (a) Any relevant iwi planning document recognised by an Iwi Authority;  (b) Measures required to address the issues specified in section 2.3.2.1;  (c) The importance of Māori customary, cultural, or traditional knowledge.	
Objective 4.3.1	To maintain air quality in those parts of the Auckland Region that have excellent or good air quality and enhance air quality in those parts of the Region where it is poor or unacceptable.	The sites where odour may be discharged are within the Urban Air Quality Management Area, apart from the Mangere Pump Station site which is within the Industrial Air Quality Management Area.
Objective 4.3.2	To avoid, remedy or mitigate significant adverse effects from the discharge of contaminants into air on human	

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	health, amenity and the environment. In particular: (a) To achieve the National Environmental Standards for Ambient Air Quality and the Auckland Regional Air Quality Targets (given in Tables 4.1 and 4.2); (b) To maintain or enhance existing amenity within the Urban Air Quality Management Areas; and (c) To maintain existing levels of amenity within Industrial and Rural Air Quality Management Areas and the Coastal Marine Air Quality Management Area.	The effects of the discharge of odour from the operation of the scheme have been assessed, taking into account FIDOL factors. Air treatment facilities are proposed for the scheme at some sites. Overall, both during normal operation and during wet weather events, adverse effects due to discharges of odour from Central Interceptor are expected to be less than minor. Temporary localised effects of a minor nature are expected at some sites during cleaning of grit traps and where discharge of moderately odorous air occurs at air intakes during moderate to severe weather events.
Objective 4.3.4	To avoid or minimise competing and incompatible land uses that aggravate any adverse effects from discharges of contaminants into air.	The discharges are therefore not expected to result in significant adverse effects.
Objective 4.3.5	To avoid reverse sensitivity conflict from the discharge of contaminants into air where sensitive activities that have differing air quality expectations are located in close proximity to activities that discharge contaminants into air.	
Objective 4.3.10	To avoid significant adverse effects on human health and the environment arising from the discharge of contaminants into air from individual sources including industrial processes, waste management activities and intensive livestock farming.	
Policy 4.4.1	To have regard to the Objectives and Policies of Chapters 2.1, 2.2 and 2.3 in assessing any resource consent to discharge contaminants into air.	Refer above.
Policy 4.4.3	Significant adverse effects from the discharge of contaminants into air from any source shall be avoided; where this is not practicable for the cumulative effects from small sources, the effects of such discharges shall be minimised.	Significant adverse effects due to the discharge of odour are not expected.
Policy 4.4.5	The discharge of contaminants into air shall be considered inappropriate where: (a) It causes, or is likely to cause, noxious, dangerous, offensive or objectionable odour, dust, particulate, smoke or ash, beyond the boundary of the premises on which the discharge is occurring; or (b) It causes, or is likely to cause, noxious, dangerous, offensive or objectionable visible emissions; or (c) It is a hazardous air pollutant and causes, or is likely to cause, adverse effects on human health or the environment, beyond the boundary of the premises on which the discharge is occurring; or (d) It causes, or is likely to cause, spray beyond the boundary of the premises on which the discharge is occurring (overspray) from the application of paint or powder coatings.	The effects of the discharge of odour from the operation of the scheme have been assessed, taking into account FIDOL factors. Air treatment facilities are proposed for the scheme at some sites. Overall, both during normal operation and during wet weather events, adverse effects due to discharges of odour from Central Interceptor are expected to be less than minor. Temporary localised effects of a minor nature are expected at some sites during cleaning of grit traps and where discharge



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Policy 4.4.6	In assessing noxious, dangerous, offensive or objectionable adverse effects from odour, dust, particulate, smoke or ash and visible discharges, consideration will be given to the Frequency, Intensity, Duration, Offensiveness and Location (FIDOL) of the discharge.	of moderately odorous air occurs at air intakes during moderate to severe weather events.
Policy 4.4.7	To avoid or minimise adverse effects from competing and incompatible land uses, including reverse sensitivity, activities shall: (a) Locate within the Air Quality Management Area suitable to the nature of the activity; and/or (b) Manage the effects of their discharges of contaminants into air in a manner that is commensurate with the receiving environment (including the relevant provisions of the underlying District Plan zones); and/or (c) Maintain adequate separation distances.	There are residential receivers in close proximity to a number of sites. However, adverse effects are generally expected to be less than minor, with temporary and infrequent localised effects of a minor nature at some sites during grit trap cleaning and where discharge of moderately odorous air occurs at air intakes during moderate to severe weather events.
Policy 4.4.15	In assessing the effects of discharges of contaminants into air, particular regard shall be had to: (a) Adverse effects on the environment, including amenity, human health and property; (b) The methods to avoid or minimise adverse effects on the environment; (c) The location of the activity and the proximity of other activities sensitive to the discharges; (d) Any cumulative adverse effects on the environment; and (e) Adverse effects on aircraft stability and/or safety from large-scale combustion sources assessed as a Discretionary Activity under Rule 4.5.32.	
Objective 5.3.1	To protect, maintain or enhance the quality of land and water in the Auckland Region by: (a) Maintaining areas of high environmental quality; (b) Minimising adverse effects on degraded natural and physical resources where these cannot be avoided; and (c) Enhancing degraded areas where practicable. This shall be achieved by avoiding or minimising the adverse effects arising from: (i) the discharge of sediment; (ii) overflows and exfiltration from wastewater networks; (iii) contaminant levels in stormwater runoff, including stormwater generated from the Activity Area of an Industrial or Trade Activity; (iv) contaminant levels in sewage treatment plant discharges; (v) the application of wastes in vulnerable groundwater protection areas; (vi) discharge of wastes from production land activities to	The project will achieve this objective by enhancing degraded areas through the reduction in wastewater overflows, resulting in benefits in Meola Creek and providing the opportunity to further reduce overflows through other means e.g. construction of a CSO Collector sewer network.  During construction erosion and sediment control measures will be in place to avoid remedy or mitigate the effects of the discharge of sediment from disturbed surfaces on nearby watercourses.



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	<p>water;</p> <p>(vii) the excessive application of fertilisers to land;</p> <p>(viii) discharges from contaminated land;</p> <p>(ix) discharges from landfills;</p> <p>(x) contaminant levels in geothermal discharges;</p> <p>(xi) contaminant levels in washwater and wastewater from Industrial or Trade Activities; and</p> <p>(xii) discharges from emergency fire service training exercises.</p>	
Objective 5.3.3 (subject to appeal)	To minimise, as far as practicable, changes to natural infiltration rates and stormwater runoff volumes, thereby preventing river erosion and protecting aquifer outflows including river and stream base flows.	<p>While the impervious area threshold will be exceeded by permanent works at five sites, the surfaces (e.g. site accessways) will be subject to low vehicle traffic and there will be limited sources of contaminants. Appropriate devices meeting TP 10 requirements will be provided.</p> <p>Where practical and appropriate accessways will be constructed using more permeable materials, such as grass cell or similar.</p> <p>During construction, stormwater will be treated by TP 10 and/or TP 90 devices as appropriate for the site (refer Technical Report K Part D).</p>
Objective 5.3.5	To prevent or minimise the adverse effects of stormwater and wastewater discharges.	<p>The project seeks to improve the wastewater network by increasing capacity in the sewer network, providing asset security, and reducing wastewater overflows so that the adverse effects of wastewater discharges are minimised.</p> <p>Measures will be taken as noted above to ensure permanent works minimise adverse effects of stormwater discharges.</p>
Objective 5.3.7	To recognise and have regard to the significant contribution that stormwater and wastewater networks and other regionally significant infrastructure make to the sustainability of the Region's environment, including the health, safety, and economic, social and cultural wellbeing	The wastewater network provides a regionally significant contribution to the sustainability of the Region's environment through reducing the incidence

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Reference	Objective/Policy	Comment
	of the community.	of water borne diseases, improving water quality and avoiding adverse effects on amenity caused by wastewater overflows. The project will help to further improve the wastewater network and its benefits.
Objective 5.3.8	To provide for and enable diversions and discharges associated with stormwater and wastewater within Urban Areas consistent with the Auckland Regional Growth Strategy and Sector Agreements while adopting the Best Practicable Option (BPO) to manage adverse effects on the environment.	While the impervious area threshold will be exceeded by permanent works at five sites, the surfaces (e.g. site accessways) will be subject to low vehicle traffic and there will be limited sources of contaminants. Appropriate devices meeting TP 10 requirements will be provided. During construction, stormwater will be treated by TP 10 and/or TP 90 devices as appropriate for the site (refer Technical Report K Part D).
Objective 5.3.15	To promote and facilitate the identification and management of land containing elevated levels of contaminants including contaminated land.	A desk top study has been undertaken for the project to identify any elevated levels of contaminants at the surface construction sites and further investigations have been undertaken at selected sites. A draft site management plan has been prepared and construction works will be appropriately managed in accordance with this.
Objective 5.3.15A	Where necessary, to ensure that the remediation and/or management of land containing elevated levels of contaminants including contaminated land, closed and operative solid waste landfills and cleanfills is undertaken to protect the environment and human health.	
Objective 5.3.16	To recognise and support the sustainable use of land containing elevated levels of contaminants including contaminated land in a manner which provides for the community's social and economic well being, consistent with the provisions of District Plans.	
Policy 5.4.2	To have regard to the objectives and policies of Chapters 2.1, 2.2 and 2.3 in assessing any resource consent to discharge contaminants, into water or onto or into land.	Refer above.
Policy 5.4.4	When processing consent applications for non network stormwater diversions and discharges under Rules 5.5.2 to 5.5.5 the ARC shall require the applicant to adopt the Best Practicable Option (BPO) for the diversion and discharge, which shall have regard to: (a) The BPO statutory criteria in the RMA; (b) That, outside Urban Areas, the scale and intensity of the development shall be consistent with the Regional Growth Strategy and Sector agreements or is part of the	While the impervious area threshold will be exceeded by permanent works at some sites, the surfaces (e.g. site accessways) will be subject to low vehicle traffic and there will be limited sources of contaminants. Appropriate devices meeting TP 10

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	<p>State highway network;</p> <p>(c) The level of adverse effects on the environment, including in particular adverse effects on:</p> <p>(i) the receiving environment due to the quality of the discharge;</p> <p>(ii) the health and safety of people and communities from flooding; and</p> <p>(iii) aquatic habitat from erosion and sedimentation, particularly for Natural Stream Management Areas and Type 2 Urban Streams;</p> <p>(d) The level of adverse effects arising from the cumulative effects of stormwater discharges and diversions at the discharge point(s) for existing and proposed land uses within the site or in the case of a State highway, that part of the highway within the same stormwater catchment. In particular, this includes any existing or redeveloped impervious areas, draining to the same discharge point as new impervious areas.</p>	<p>requirements will be provided.</p> <p>During construction, stormwater will be treated by TP 10 and/or TP 90 devices as appropriate for the site (refer Technical Report K Part D).</p>
Policy 5.4.4A	<p>When processing consent applications for stormwater diversions and discharges under Rules 5.5.2 to 5.5.5 the ARC shall recognise the strategic importance of stormwater systems owned or operated as part of regionally significant infrastructure in achieving sustainable management and enabling people and communities to meet their needs for economic, social and cultural well-being.</p>	<p>The proposed works involve stormwater measures for regionally significant infrastructure that will enable people and communities to meet their needs for economic, social and cultural well-being.</p>
Policy 5.4.4B	<p>In addition to the matters listed in Policy 5.4.4, consent applications for non network stormwater diversions and discharges under Rules 5.5.2 to 5.5.5 will also be assessed against the following matters:</p> <p>(a) The extent to which:</p> <p>(i) the scale and intensity of the land use activity is consistent with that provided for in the District Plan; or</p> <p>(ii) the application adopts the outcomes of any Structure Plan (that has been incorporated into a District Plan); or</p> <p>(iii) the application adopts the outcomes of any Integrated Catchment Management Plan (for the area within which the discharge occurs or will occur) to ensure an integrated approach; or</p> <p>(b) Outside Urban Areas, whether the development is located in a growth area and is in accordance with the Regional Growth Strategy, and Sector agreements, or is part of the State highway network, including the timing of such development, so as to avoid cumulative adverse effects of stormwater discharges outside Urban Areas;</p> <p>(c) The outcomes of any consultation undertaken with any</p>	<p>The proposed works are for a network utility service.</p> <p>Outside the urban area, the proposed works involve facilities at the Mangere WWTP and therefore will not contribute to issues of cumulative adverse effects due to urban development outside the urban area.</p>

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Reference	Objective/Policy	Comment
	<p>potentially adversely affected parties;</p> <p>(d) The extent to which a wide range of management options have been considered to prevent or minimise the adverse effects of any existing and maximum potential landuse and any consequential diversions and discharges, and associated river and lake bed activities to ensure the most appropriate option is selected;</p> <p>(e) The level of stormwater quality management identified by the relevant Integrated Catchment Management Plan to prevent or minimise the adverse effects of stormwater contaminants;</p> <p>(f) If an ICMP has not been prepared, the assessment criteria will include the extent to which stormwater quality management:</p> <ul style="list-style-type: none"> <li>(i) adopts the Best Practicable Option;</li> <li>(ii) adopts methods (source control, traditional or innovative) to prevent or minimise the adverse effects of contaminants on the receiving environment, including total suspended solids (TSS) loads anticipated to arise on a long term basis from the proposed impervious area;</li> </ul> <p>(g) Whether the proposal:</p> <ul style="list-style-type: none"> <li>(i) avoids exacerbating or causing flooding of the floor level (authorised by a local authority) of a habitable building(s), or a State highway;</li> <li>(ii) avoids the use of flood storage volume below the 100 year ARI flood level;</li> </ul> <p>(h) The extent to which there is the potential for local scour and downstream channel erosion, particularly for Natural Stream Management Areas and Type 2 Urban Streams and that this is managed to prevent or minimise adverse effects;</p> <p>(i) The extent to which the activity incorporates low impact design and non-structural methods to prevent or minimise adverse effects (including minimising the extent of impervious area and stormwater runoff volumes);</p> <p>(j) The extent to which operation and maintenance programmes are provided to ensure the effective ongoing functioning of the discharge;</p> <p>(k) The extent to which stormwater quality treatment and quantity control are, or will be, provided for existing and proposed land uses within the same stormwater catchment or site to reduce existing and potential adverse effects. In particular, this includes any existing or redeveloped impervious areas, draining to the same discharge point as new impervious areas;</p> <p>(l) Where assets are to be vested to another organisation,</p>	

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	<p>whether a financial bond is required (from the applicant to that other organisation) for the purposes of ensuring effective ongoing operation and maintenance of the stormwater management methods proposed;</p> <p>(m) With respect to existing discharges and diversions, the extent to which any prioritised programme for implementing upgrades and improvements to infrastructure considers and balances environmental effects, operational needs, physical constraints, practicality, timing issues, and financial considerations;</p> <p>(n) Having regard to Policy 5.4.4C, the extent to which monitoring and reporting may be required.</p>	
Policy 5.4.4C	<p>Where the stormwater management methods proposed by an applicant are in accordance with the design methods in ARC Technical Publication 10: Stormwater Management Devices: Design Guidelines Manual second edition (May 2003) and address the matters listed in Policy 5.4.4, a detailed Assessment of Effects on the Environment (AEE) is not required to support a resource consent application under Rules 5.5.2 to 5.5.4 (but note excluding Rule 5.5.5). Alternatively, an applicant may prepare a detailed AEE, in accordance with the Fourth Schedule of the RMA, to address the adverse effects (including cumulative effects) arising from their activity and propose alternative management methods to avoid, remedy or mitigate those effects.</p>	<p>It is proposed to provide appropriate devices meeting TP 10 requirements. During construction, stormwater will be treated by TP 10 and/or TP 90 devices as appropriate for the site (refer Technical Report K Part D).</p>
Policy 5.4.36	<p>To facilitate the remediation or management of contaminated land in cooperation with territorial authorities, where site investigations show a significant risk to human health.</p>	<p>Construction at sites that have been identified as containing elevated levels of contaminants will be appropriately managed, including through the preparation of a site management plan.</p>
Policy 5.4.37A	<p>When processing discharge consent applications for land containing elevated levels of contaminants including contaminated land the ARC shall have regard to the actual and potential adverse effects of the activity, physical constraints of the site, operational practicalities, and the financial implications of the investigation, remediation, management and monitoring options imposed compared with other options.</p>	<p>The AEE addresses the effects and management of the proposed works, including potential disposal options. A draft site management plan has been prepared.</p>
Policy 5.4.44 (subject to appeal)	<p>Reuse of washwater will be encouraged. Washwater disposal to land will be acceptable where it will not result in contaminant runoff or the accumulation of contaminants, such as hydrocarbons and heavy metals, above acceptable levels in the receiving environment. Washwater should only be discharged to water where other options including disposal to the sanitary sewer are impractical,</p>	<p>Site construction related discharges will be discharged as appropriate, depending on quality, and will be treated if necessary, for example by settlement or flocculation to reduce sediment levels.</p>

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Reference	Objective/Policy	Comment
	and a thorough evaluation of the assimilative capacity of the receiving environment has been carried out proving the discharge will not give rise to any significant adverse effects.	
Objective 6.3.3	To maintain the quantity and levels of water in the Region's aquifers in the long term so as to safeguard spring flows, stream base flows, water quality, and geothermal temperature and amenity.	The tunnelling and shaft excavation works will result in some diversion of groundwater and the effects of this on the groundwater regime have been considered. With appropriate construction methodology and management noticeable effects on aquifers are considered unlikely to occur.
Objective 6.3.8	To enable people and communities to divert groundwater while avoiding, remedying or mitigating adverse effects on groundwater regimes, surface water bodies, neighbouring structures and services and on people and communities.	
Policy 6.4.1	<p>The taking and use of water from rivers, streams, lakes, wetlands, and aquifers, the erection of dams and the damming of water shall not result in more than minor adverse effects on the values of the Wetland, Natural Stream (excluding those in Water Supply Management Areas), High Use Stream and High Use Aquifer Management Areas, and Urban River and Stream Management Areas</p> <p>– Type 1 Streams where biological communities and water quality are currently good, as characterized by Anticipated Environmental Result 5.7.5 in Chapter 5 and</p> <p>– Type 2 Streams.</p> <p>In considering the effects on Natural Stream and Wetland Management Areas in Water Supply Management Areas, regard shall be had to Policies 3.5.4.1 to 3.5.4.2 in Chapter 3 Management Areas.</p>	The tunnels pass beneath streams in the Auckland Isthmus. Adverse effects on the values of these areas are not expected to be more than minor.
Policy 6.4.2	To have regard to the objectives and policies of Chapters 2.1, 2.2 and 2.3, and to the objectives and policies in Chapter 3.5. Water Supply Management Areas where relevant, in assessing any resource consent to take and use water from a river, stream, lake, wetland, dam or aquifer, and any proposal to erect a dam and dam or divert water, and any proposal to drill a hole or bore.	Refer above.
Policy 6.4.5	<p>Any proposal to take and use water for which a resource consent is required shall demonstrate that:</p> <p>(a) The water quantity and quality taken is consistent with the requirements of the activity to promote efficient use of water resources;</p> <p>(b) In situations where it is likely that the activity will result in significant adverse effects on the environment, there are no practicable alternative water sources available;</p> <p>(c) Consideration has been given to water conservation and wastewater re-use methods;</p> <p>(d) The consequential environmental effects of wastewater</p>	The water take and use relates to the diversion of groundwater and dewatering of the tunnel and excavations, therefore these matters are not applicable in this case. Consideration has been given to the effects on other groundwater users and groundwater quality in Section 11.2 of the AEE and adverse effects are considered to be



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Reference	Objective/Policy	Comment
	<p>generation have been considered concurrently;</p> <p>(e) The taking of water will not adversely affect the water quality of the water body; and</p> <p>(f) Consideration has been given to existing lawful takes and priorities of take (including those granted by neighbouring regional councils where water bodies cross regional boundaries) including but not limited to:</p> <ul style="list-style-type: none"> <li>(i) the location (including distance from existing lawful takes);</li> <li>(ii) quantity, rate and timing of the take; and</li> <li>(iii) depth of groundwater take other than provided for by Policy 6.4.35 (e).</li> </ul> <p>(g) Regard has been had to the purpose and values for which the water body is being managed (including those identified by neighbouring Regional Councils).</p>	unlikely.
Policy 6.4.50	<p>Any proposal to divert groundwater for which a resource consent is required shall demonstrate that the diversion:</p> <p>(a) Ensures the flow regime required for the life supporting capacity of water bodies is provided for including:</p> <ul style="list-style-type: none"> <li>(i) low/minimum flows;</li> <li>(ii) levels and flows in wetlands; and</li> <li>(iii) lake levels;</li> </ul> <p>(b) Ensures existing lawful groundwater users are not adversely affected by the proposal;</p> <p>(c) Ensures that the proposal avoids, remedies or mitigates any ground settlement that may result in any adverse effects including:</p> <ul style="list-style-type: none"> <li>(i) damage to structures;</li> <li>(ii) damage to buildings; and</li> <li>(iii) damage to services (e.g. roads, pavements, power, gas, electricity, and fibre optic cables);</li> </ul> <p>(d) Ensures that the groundwater diversion does not cause or exacerbate any flooding;</p> <p>(e) Avoids any actual or potential adverse cumulative effects that may arise from the scale, location and/or number of groundwater diversions in the same area;</p> <p>(f) Avoids any actual or potential adverse effects of the discharge of groundwater containing:</p> <ul style="list-style-type: none"> <li>(i) sediment;</li> <li>(ii) contaminants;</li> </ul> <p>(g) Ensures that adverse effects on ecosystem habitat, both terrestrial and freshwater, are avoided, remedied or mitigated; and</p> <p>(h) Monitoring has been incorporated where appropriate, including but not limited to:</p> <ul style="list-style-type: none"> <li>(i) measurement and recording of water levels and</li> </ul>	<p>Consideration has been given to the effects of the tunnelling and shaft excavations on other groundwater users in Section 11.2 of the AEE and adverse effects are considered to be unlikely. The potential for ground settlement has also been considered and with appropriate methodology settlement levels are not expected to cause structural damage to buildings and services.</p> <p>Groundwater that is removed from the tunnel during construction for dewatering will be either discharged to sewer or stormwater and will be treated if required as noted in Section 6.7 of the AEE report.</p> <p>Monitoring will be implemented to measure the effects of construction on groundwater and settlement.</p>



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	<p>pressures; and</p> <p>(ii) measurement and recording of the movement of ground, buildings and other structures.</p>	

### 3. Auckland Council Regional Plan: Sediment Control

Auckland Council Regional Plan: Sediment Control		
Reference	Objective/Policy	Comment
Objective 5.1.1	To maintain or enhance the quality of water in waterbodies and coastal water.	Erosion and sediment control measures will be used to minimise water quality effects.
Objective 5.1.2	To sustain the mauri of water in waterbodies and coastal waters, ancestral lands, sites, waahi tapu and other taonga	
Policy 5.2.1	Land disturbance activities which may result in the generation and discharge of elevated levels of sediment will be required to employ methods which avoid, remedy or mitigate adverse effects on the quality of water in waterbodies and coastal waters.	
Policy 5.2.2	<p>Land disturbance activities which may result in the discharge of elevated levels of sediment into waterbodies and coastal waters shall be considered inappropriate where they will have a significant adverse effect on:-</p> <p>(i) The qualities, elements and features which contribute to the natural character of areas of the coastal environment, (including the coastal marine area) wetlands, lakes and rivers and their margins; and which are identified in the Auckland Regional Policy Statement and the Auckland Regional Plan: Coastal as having outstanding or regionally significant ecological, landform, geological or landscape values.</p> <p>(ii) Outstanding and regionally significant natural features and landscapes as identified in the Auckland Regional Policy Statement and the Auckland Regional Plan: Coastal.</p> <p>(iii) Areas of significant indigenous vegetation and significant habitats of indigenous fauna as identified in the Auckland Regional Policy Statement and the Auckland Regional Plan: Coastal as having international, national and regional significance.</p> <p>(iv) Areas of significance to Tangata Whenua as identified in the Auckland Regional Policy Statement and the Auckland Regional Plan: Coastal.</p> <p>(v) Areas identified by Tangata Whenua in accordance with Tikanga Maori as being of special spiritual, cultural and historical significance.</p> <p>Unless the adverse effects can be avoided, remedied or mitigated.</p>	As part of the construction process sediment control measures will be implemented that manage erosion and sediment on site in accordance with the guidelines of TP90 therefore avoiding significant adverse effects of the nature stated.

#### 4. Auckland Council Regional Plan: Coastal

Auckland Council Regional Plan: Coastal		
Reference	Objective/Policy	Comment
3.3.1 Objective	To preserve the natural character of the coastal environment by protecting the coastal marine area from inappropriate subdivision, use and development.	<p>The proposed works in the coastal environment at Mangere Pump Station and PS 23 (Frederick Street) are in modified environments and not within areas of high natural character.</p> <p>There are expected to be temporary adverse effects on natural character at PS 23, largely due to the removal of vegetation, but these effects will be mitigated through replanting. The temporary construction platform will be removed upon completion of construction works.</p> <p>Appropriate design and treatment of the permanent features at the PS 23 site, such as the use of recessive materials, will be used to minimise adverse effects on the landscape quality, aesthetic value and landscape sensitivity of the Manukau Harbour.</p> <p>The proposed works at both Mangere Pump Station and PS 23 will occur in areas where there are existing Watercare facilities. The locations are considered to be appropriate areas of the coastal environment for this development.</p>
3.3.2 Objective	To preserve the natural character of the coastal environment by encouraging appropriate subdivision, use and development above Mean High Water Springs to locate in appropriate areas of the coastal environment.	
3.4.1 Policy	The natural character of the coastal environment shall be preserved and protected from inappropriate subdivision, use, and development by avoiding where practicable, remedying or mitigating the adverse effects of subdivision, use and development on the qualities, elements and features which contribute to the natural character of the coastal environment, including those areas characterised by modification and development.	
3 4.2 Policy	<p>In assessing the actual or potential effects of subdivision, use and development on natural character particular regard shall be had to:</p> <p>a) preserving the natural character of the coastal marine area in Coastal Protection Areas 1 and 2;</p> <p>b) preserving the natural character of the coastal marine area in Outstanding and Regionally Significant Landscape Areas, where these areas are predominantly natural;</p> <p>c) avoiding, where practicable, adverse effects on natural character values in other areas of the coastal</p>	<p>The tunnel will pass beneath an area of CPA 1 on the southern side of the Manukau Harbour. At the proposed depth it is not expected to affect the natural character of the CPA 1. The tunnel is proposed to be located beneath the pahoehoe lava flow.</p> <p>The coastal edge around the northern shore of Hillsborough</p>

Auckland Council Regional Plan: Coastal		
Reference	Objective/Policy	Comment
	<p>marine area which are predominantly in their natural state and which have a high natural character;</p> <p>d) protecting appropriate remaining elements of natural character in those areas characterised by modification and development.</p>	<p>Bay is a Regionally Significant Landscape (Rating 5) in the ARP:C. Appropriate design and treatment of the permanent features at the PS 23 site, such as the use of recessive materials, will be used to minimise adverse effects on the landscape quality, aesthetic value and landscape sensitivity of the Manukau Harbour.</p>
3.4.3 Policy	<p>In assessing the actual or potential adverse effects of subdivision, use and development, including cumulative adverse effects, on the natural character of the coastal environment particular regard shall be had to the relevant policies in Chapters 4, 5, 6, and 8, in recognition of the role that landscape, natural features, ecosystems, and certain cultural and historical areas and sites make to natural character.</p>	Refer below.
3.4.4 Policy	<p>When subdivision, use and development in the coastal marine area gives rise to actual or potential adverse effects on the natural character of the coastal environment, where appropriate these effects shall be remedied or mitigated by restoration or rehabilitation of the natural character of the coastal environment.</p> <p>In determining whether any adverse effects on natural character can be remedied or mitigated by restoration or rehabilitation, and if so, the level and extent of restoration and rehabilitation that is to be carried out, regard shall be had to:</p> <p>a) the extent to which the qualities and features of natural character in the area of the proposed subdivision, use and development will be adversely affected and the ability to restore or rehabilitate natural character in the area subject to the proposal; or</p> <p>b) where restoration or rehabilitation is not practicable in the area subject to the proposal, the potential to mitigate any adverse effects by the rehabilitation or restoration of natural character in another area of the coastal environment; and</p> <p>c) where restoration plantings are carried out, preference shall be given to the use of indigenous species with a further preference for local genetic stock.</p>	<p>The temporary adverse effects on natural character at PS 23 will be mitigated through the removal of the temporary construction platform and reinstatement of the CMA and coastal edge and replanting with native species.</p>
4.3.1 Objective	<p>To protect Outstanding Landscapes, and the key elements, features and patterns of Regionally Significant Landscapes (as identified in the Plan</p>	<p>The Regionally Significant Landscape along the</p>

<b>Auckland Council Regional Plan: Coastal</b>		
<b>Reference</b>	<b>Objective/Policy</b>	<b>Comment</b>
	Maps) from inappropriate subdivision, use and development in the coastal environment.	Hillsborough Bay coastal edge contains cliffline vegetation.
4.3.2 Objective	To maintain and enhance the diversity, integrity and landscape quality of the coastal environment.	However, there is somewhat of a break in the vegetation at the PS 23 site, although some vegetation removal will be required. Mitigation measures, such as replanting, and the use of appropriate design and treatment of permanent features at the site are proposed to minimise effects on this landscape.
4.4.2 Policy	<p>a) Subdivision, use and development in the coastal marine area shall be considered inappropriate where it would result in significant adverse effects on those key elements, features and patterns which contribute positively to the landscape quality, aesthetic value and landscape sensitivity of those areas identified in the Plan as being Regionally Significant Landscapes of the coastal environment.</p> <p>b) In assessing the significance of such adverse effects, particular regard will be had to ensuring that those landscape elements, features and patterns which contribute to the visual integrity of the landscape unit and its value as a Regionally Significant Landscape are protected.</p>	<p>The temporary construction platform will be removed upon completion of construction works.</p> <p>The tunnel will be located below the seabed and will not have adverse landscape effects.</p>
4.4.3 Policy	In those areas of the coastal environment not identified in this Plan as Outstanding or Regionally Significant Landscapes, any subdivision, use and development in the coastal marine area shall be of a scale, design and location, and undertaken in a manner which avoids, where practicable, remedies or mitigates adverse effects on key landscape elements, features and patterns.	<p>The coastline in the vicinity of the proposed EPR structure at Mangere Pump Station is modified, with a rock seawall along this stretch of coastline. The scale, design and location is consistent with its location adjacent to the Mangere WWTP.</p> <p>The tunnel will be located below the seabed and will not have adverse landscape effects.</p>
4.4.5 Policy	<p>In assessing the effects of subdivision, use and development, including cumulative effects in the coastal marine area on landscape values, particular regard shall be had to:</p> <p>a) ensuring where practicable that it is of a scale, location and design which encourages its integration with the type and intensity of development in the adjacent areas of the coastal marine area and with the pattern of subdivision, use, and development above Mean High Water Springs;</p> <p>b) maintaining and where practicable enhancing visual links between the coastal marine area and adjacent land;</p> <p>c) maintaining and where practicable, enhancing</p>	The effects of the temporary construction platform on the landscape will be temporary and the coastal edge will be reinstated upon completion of construction works. The proposed permanent seawall will result in some change to the topography of the coastal edge compared to the existing situation. It is noted that there is an existing seawall at the site and the natural coastal edge has already been modified. The seawall will be designed to integrate with the

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Reference	Objective/Policy	Comment
	<p>appropriate vegetation patterns and in particular, areas of indigenous vegetation both within the coastal marine area and on land;</p> <p>d) maintaining as far as practicable natural variations in the topography of the foreshore;</p> <p>e) maintaining the topography of the seabed in areas which are significant representative examples of sub-tidal landforms of the Auckland Region, or which are visually significant geological features;</p> <p>f) ensuring structures are designed and constructed in a manner consistent with Chapter 12: Policy 12.4.3.</p> <p>g) the contribution of existing structures and activities to the landscape character of the coastal environment.</p>	<p>setting. The permanent works above Mean High Water Springs will incorporate mitigation measures such as replanting, and the use of appropriate design and treatment of permanent features at the site to minimise effects on this landscape.</p>
5.3.1 Objective	To protect the dynamic functioning of physical coastal processes.	The effects on coastal processes of the temporary construction platform at PS 23 and the EPR structure at the Mangere Pump Station site are expected to be no more than minor.
5.3.2 Objective	To protect the integrity, functioning and resilience of ecosystems within the coastal environment.	There will be a temporary loss of habitat at PS 23 but the temporary construction platform will be removed and the foreshore reinstated. The area of foreshore and resulting habitat loss at the Mangere Pump Station site is small.
5.3.3 Objective	To protect from inappropriate subdivision, use and development and where appropriate, preserve the ecological and physical values and processes of Coastal Protection Areas, in recognition of their intrinsic values, their regional, national and international significance, and their high vulnerability to adverse environmental effects.	The tunnel passes beneath the CPA 1 in the Manukau Harbour just north of Kiwi Esplanade. This area is noted for its value as a roost and feeding ground for migratory and wading birds and the pahoehoe lava flows. At the proposed depth in the CMA it is not expected to affect the birds and will pass beneath the lava flow.
5.4.2 Policy	<p>The values of, and the ecological and physical processes functioning in, Coastal Protection Areas 1 shall be preserved or protected as appropriate by:</p> <p>a) avoiding inappropriate subdivision, use and development which will result in more than minor modification of, or damage to, these values and processes, or result in their destruction;</p> <p>b) ensuring that as far as practicable changes in the</p>	

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Reference	Objective/Policy	Comment
	size, quality and habitat diversity of these areas arise only from the functioning of natural processes.	
5.4.4 Policy	In those areas not identified in this plan as Coastal Protection Areas 1 and 2, any subdivision, use and development in the coastal marine area shall avoid as far as practicable, remedy or mitigate adverse effects on indigenous vegetation or fauna, their habitats, natural features and ecological and physical processes.	
5.4.5 Policy	<p>In assessing the effects, including cumulative effects, of subdivision, use and development on natural features and ecosystems throughout the coastal marine area regard shall be had to:</p> <ul style="list-style-type: none"> <li>a) protecting the physical integrity of any natural feature, and maintaining any physical or biological processes necessary to ensure the functioning of the natural feature;</li> <li>b) protecting the identified educational, scientific, amenity, cultural or heritage values of the natural feature and its contribution to the natural character and landscape values of the coastal environment;</li> <li>c) maintaining the connections between plant communities, to protect the overlapping use of these areas for feeding, breeding, and sheltering of indigenous fauna;</li> <li>d) minimising the fragmentation of habitats and ensuring any resulting area is of sufficient size to allow it to continue to function as a habitat;</li> <li>e) maintaining or enhancing water quality to safeguard the life-supporting capacity of ecosystems;</li> <li>f) maintaining and protecting natural biodiversity, productivity and biotic patterns;</li> <li>g) maintaining the natural substrate composition by: <ul style="list-style-type: none"> <li>i avoiding the addition of material not found naturally in the area;</li> <li>ii maintaining natural processes of erosion, movement and deposition of substrate; and</li> <li>iii avoiding disturbance and deposition which would have significant or irreversible effects on the substrate composition.</li> </ul> </li> </ul>	<p>The temporary construction platform at PS 23 will be removed upon completion of construction works and where necessary, the CMA will be reinstated with clean marine sediment of an appropriate grain size (i.e. fine to very fine sand).</p> <p>Erosion and sediment control measures will be used to minimise effects on water quality.</p>
5.4.6 Policy	<p>When subdivision, use and development in the coastal marine area gives rise to actual or potential adverse effects on natural features and coastal and marine ecosystems, where appropriate these effects shall be remedied or mitigated by restoration or rehabilitation of the natural features and coastal and marine ecosystems.</p> <p>In determining whether any adverse effects on natural features and coastal and marine ecosystems</p>	



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	<p>can be remedied or mitigated by restoration or rehabilitation, and if so, the level and extent of restoration or rehabilitation that is to be carried out, regard shall be had to:</p> <p>a) the extent to which the qualities and features of natural features and coastal and marine ecosystems in the area of the proposed subdivision, use and development will be adversely affected and the ability to restore or rehabilitate natural features and coastal and marine ecosystems in the area subject to the proposal; or</p> <p>b) where restoration or rehabilitation is not practicable in the area subject to the proposal, the potential to mitigate any adverse effects by the rehabilitation or restoration of natural features and coastal and marine ecosystems within other parts of the coastal marine area; and</p> <p>c) where restoration plantings are carried out, preference shall be given to the use of indigenous species with a further preference for local genetic stock.</p>	
6.3.2 Objective	To sustain the mauri of natural and physical resources of the coastal environment, and to enable provision for the social, economic and cultural wellbeing of Maori.	The project will assist in the restoration of the mauri of natural and physical resources by reducing wastewater overflows to the environment.
6.4.1 Policy	<p>The relationship of Maori and their culture and traditions with their ancestral taonga will be recognised and provided for by:</p> <p>a) identifying, evaluating and appropriately protecting in this Plan, in accordance with tikanga Maori, characteristics of special value in the coastal marine area, including waahi tapu, tauranga waka, mahinga mataitai and taonga raranga; and</p> <p>b) progressively updating this Plan in accordance with Policy 6.4.1(a) as information is made available through the plan change or variation process; and</p> <p>c) determining, in accordance with tikanga Maori, the means whereby those characteristics of special value which Tangata Whenua choose not to identify in this Plan are to be protected; and</p> <p>d) avoiding, remedying or mitigating the adverse effects of subdivision, use and development on those natural and physical resources of the coastal marine area which are of special spiritual, historical, and cultural significance to Tangata Whenua, regardless of whether or not they are identified in this plan.</p>	<p>Watercare has undertaken consultation with iwi to help to identify any potential effects of the project on tangata whenua or cultural heritage matters. The initial issues raised, and how these have been addressed, are outlined in Section 8 of the AEE.</p> <p>The proposed works do not affect any areas of special value identified on Map Series 3 Sheet 1. No recorded archaeological sites will be affected.</p>

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	NB: Areas of special value to Tangata Whenua which have been identified to the ARC are shown on the Plan Maps (Map Series 3 Sheet 1). Any application for a resource consent or a plan change proposal which may affect those areas of special value will be referred to the relevant Tangata Whenua, and their concerns taken into account in the assessment of the proposal in accordance with the provisions of the RMA and this Plan.	
6.4.2 Policy	<p>Where appropriate, the ARC will involve Tangata Whenua in the resource management process where decisions are being made on issues of significance to Tangata Whenua concerning ancestral taonga or tikanga Maori by:</p> <ul style="list-style-type: none"> <li>a) taking into account any relevant Iwi planning document recognised by an Iwi authority; and</li> <li>b) encouraging applicants to consult the appropriate Tangata Whenua prior to submitting any proposal for a plan change or a resource consent application; and</li> <li>c) consulting the appropriate Tangata Whenua on any proposal for a plan change or any relevant resource consent application; and</li> <li>d) where Tangata Whenua are an affected party, providing for tikanga Maori and marae hearings where appropriate, and for the use of Maori language in statutory procedures; and</li> <li>e) providing for tikanga Maori and marae hearings on the request of the applicant, where Tangata Whenua are the applicant; and</li> <li>f) providing for the appointment of a person with recognised expertise in tikanga Maori to any hearing committee where ancestral taonga or tikanga Maori is a significant issue to Tangata Whenua; and</li> <li>g) recognising the importance of Maori customary, cultural, or traditional knowledge; and</li> <li>h) enabling Tangata Whenua to participate in the assessment of the effects of any activities on relationships with ancestral taonga, including access to, or use of, ancestral taonga.</li> </ul>	As part of the consultation process Watercare has been consulting with iwi groups who may have mana whenua interests over the works area.
7.3.1 Objective	To maintain and enhance public access to, along and within the coastal marine area.	The proposed works in the vicinity of PS 23 (Frederick Street) will only affect a small area and access will still be available around the site at low tide.  At Mangere Pump Station it will be necessary to restrict
7.4.1 Policy	<p>Subdivision, use, development and protection should ensure that public access to, along and within the coastal marine area is maintained or enhanced, except where it is necessary to restrict access in order to:</p> <ul style="list-style-type: none"> <li>a) protect areas of significant indigenous vegetation,</li> </ul>	

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	<p>significant habitats of indigenous fauna or natural features; or</p> <p>b) protect areas or sites within the coastal marine area identified by the Tangata Whenua as being of special spiritual, cultural and historical significance; or</p> <p>c) protect significant cultural heritage places and areas identified in the Cultural Heritage Schedules and Plan Maps; or</p> <p>d) protect public health or safety;</p>	<p>public access to the coastal walkway for a short period, but other walkways in the area will remain open.</p> <p>Restricting public access to these areas during the works will enable the works to be carried out and protect public health and safety.</p>
7.4.2 Policy	<p>Except as provided in Policy 7.4.1(a) to (f) above, subdivision, use and development which has an adverse effect on public access to, along or within the coastal marine area, should be required to remedy or mitigate that effect.</p>	
7.4.3 Policy	<p>Except as provided in Policy 7.4.1(a) to (f) above, subdivision use and development should not restrict the reasonable access of Tangata Whenua to sites and areas in the coastal marine area of special spiritual, cultural, or historical significance.</p>	
9.3.1 Objective	<p>To enable appropriate subdivision, use and development in the coastal marine area, recognising that the coastal marine area is a finite resource.</p>	<p>The proposed works will occupy a modest area of the CMA and are an appropriate use in the coastal marine area as they will enable the construction and operation of regionally important infrastructure.</p>
9.3.2 Objective	<p>To recognise the national and regional importance of activities which depend upon the use of natural and physical resources of the coastal environment, such as maritime and air transport services, regional infrastructure and other water based industrial, commercial and recreational activities.</p>	<p>The proposed works involve regional infrastructure that has a functional need to locate in the CMA in order to connect the network between the Auckland Isthmus and Mangere.</p>
9.4.1 Policy	<p>Subdivision, use and development within parts of the coastal marine area shall generally be considered appropriate where that subdivision, use and development depends upon the natural and physical resources of the coastal marine area, and where adverse effects are avoided, remedied or mitigated.</p>	
10.3.1 Objective	<p>To provide for appropriate subdivision, use and development in the coastal marine area, and to protect the coastal marine area from inappropriate subdivision, use and development.</p>	<p>The proposed works are appropriate in the CMA as they involve regional infrastructure that has a functional need to locate in the CMA.</p>

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10.3.2 Objective	To ensure that efficient use is made of the coastal marine area.	The proposed works are for regionally significant infrastructure for the public rather than individual good and make efficient use of the CMA.
10.3.3 Objective	To maintain where appropriate, the open space nature of the coastal environment.	The works in the CMA will not adversely affect the open space nature of the coastal environment.
10.4.2 Policy	Recreation is a significant and important use of the coastal marine area, and any proposal for subdivision, use and development shall have regard to the desirability of maintaining or enhancing recreational use of the coastal marine area while avoiding, remedying or mitigating adverse effects on existing activities.	The proposed works will not have an adverse effect on recreational use of the coastal marine area. The area of the CMA at PS 23 that will not be publicly accessible during the works period is small.
10.4.3 Policy	Subdivision, use and development of the coastal marine area shall be considered more appropriate where the environment has already been highly modified by human activities, or located in areas where development already exists, unless: a) location elsewhere in the coastal marine area of the Auckland Region would better avoid, remedy, or mitigate significant adverse effects of that subdivision, use and development; or b) an application brought by Tangata Whenua better provides for the special relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.	The works in the CMA that will occur above ground are located in areas that have already been highly modified by human activities. The tunnel will be located well below the seabed.
10.4.4 Policy	The positive environmental effects and benefits arising from any proposal for subdivision, use and development shall be taken into account when assessing the overall effects of a proposal.	The proposed works will have significant positive effects. The proposed works will provide additional sewer network capacity for growth and development, provide asset security through the duplication of the lower section of the ageing Western Interceptor, and reduce wastewater overflows into streams and the Waitemata Harbour.
10.4.5 Policy	Any proposal for subdivision, use and development shall be located, designed, constructed or placed to: a) complement as far as practicable the character of the environment in which it is located; and b) avoid as far as practicable, remedy or mitigate	At PS 23, mitigation measures, such as the use of appropriate design and treatment of permanent features at the site are

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	adverse effects on ecological and physical processes beyond those which are already occurring in the immediate and surrounding area, including any area above Mean High Water Springs; and c) where practicable, be consistent with relevant resource management strategies of adjoining territorial authorities.	proposed to assist with integrating the features into the landscape.
10.4.6 Policy	Where practicable, subdivision, use and development shall be undertaken at times of the day, year or tides where this will avoid adverse effects on the coastal environment. Where complete avoidance is not practicable adverse effects shall be remedied or mitigated, particularly effects on: a) the growth and reproduction of marine and coastal vegetation and the feeding, spawning and migratory patterns of marine and coastal fauna, including bird roosting, nesting and feeding; or b) recreational use of the coastal marine area; or c) other established activities located in the coastal environment which are likely to be affected by any proposal.	To minimise effects on shore birds at Kiwi Esplanade, the most disruptive construction activities will be timed, to the extent practicable, to occur when shore bird numbers are at their lowest (August to December).  Works in the CMA will be timed as far as possible to be carried out at low tide.
10.4.7 Policy	Subdivision and development within Coastal Protection Areas shall generally be considered inappropriate where it will: a result in any regular or sustained disturbance of migratory bird roosting, nesting and feeding areas, which noticeably reduces the level of use by them for these purposes, or which makes them permanently abandon these sites; or b result in the disturbance of the foreshore and seabed where this would destroy any regionally or nationally rare, threatened or endangered plant community or indigenous marine or terrestrial fauna; or c result in a level of modification, or damage to flora and fauna within these areas such that the values for which the Coastal Protection Area is recognised are affected in more than a minor way; or d results in the permanent use or occupation of the foreshore and seabed so that the areas become inaccessible to the plants, bird and other fauna presently using the area, to a level or a degree that the value or function of the Coastal Protection Area is significantly reduced; or e result in the disturbance, use or occupation of the foreshore and seabed or any change to physical processes that would destroy any recognised natural	The tunnel passes beneath the CPA 1 in the Manukau Harbour just north of Kiwi Esplanade. This area is noted for its value as a roost and feeding ground for migratory and wading birds and the pahoehoe lava flows. At the proposed depth in the CMA it is not expected to affect the birds and will pass beneath the lava flow.

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	<p>feature within the area, or result in a level of modification or damage to the natural feature such that the values for which the area or feature is recognised are affected in more than a minor way; or</p> <p>f result in a reduction in water quality which would adversely affect the natural ecological functioning of the area; or</p> <p>g result in the deposition of material at levels which would adversely affect the natural ecological functioning of the area; or</p> <p>h provide or enhance opportunities for access by and establishment of pest species; or</p> <p>i be of a type or scale, or be located in a place, which would result in the fragmentation of the values of the area such that its physical integrity is destroyed.</p>	
10.4.10 Policy	<p>Occupation of the coastal marine area (in terms of section 12 (2) of the RMA) shall be considered inappropriate unless:</p> <p>a) occupation is reasonably necessary for the proper functioning of the activity; and</p> <p>b) adverse effects arising from space proposed to be occupied can be avoided where practicable, remedied or mitigated, having regard to the loss of public access to and along the coastal marine area.</p>	The proposed structures will need to occupy the CMA for the functioning of the activity and any adverse effects from the occupation, including on public access, will be no more than minor.
10.4.13 Policy	Nuisance effects from noise, odour, dust, light, glare, vibration, and traffic shall be avoided, remedied or mitigated by the adoption of the best practicable option where appropriate.	A construction management plan will be prepared for the works and will include measures to address the control of these effects.
10.4.14 Policy	Construction or demolition of any structure or other work shall be undertaken in a manner which avoids, remedies or mitigates adverse effects on the environment.	Measures to avoid, remedy or mitigate the adverse effects on the environment are discussed throughout the AEE report, including Part A Sections 6 and 11 - 13 and Part B.
10.4.15 Policy (not operative)	<p>In assessing the appropriateness of proposals for use and development, regard shall be had to the effects that any proposal may have, or may potentially have, on the activities provided for within the following management areas:</p> <ul style="list-style-type: none"> <li>• Port Management Areas;</li> <li>...</li> </ul> <p>Where a proposal for use and development may have a significant adverse effect on the activities provided for in the particular Management Areas specified above, it shall generally be considered</p>	The tunnel will cross beneath Manukau Harbour to the west of the Onehunga Port Management Area and the proposed works are not expected to have an effect on this area.



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	inappropriate. NB: Coastal Protection Areas are not included here as Policy 10.4.7 covers these areas.	
10.4.16 Policy	When assessing resource consent applications by stormwater or wastewater network utility operators to occupy and use the CMA, regard shall be had to the strategic importance of stormwater and wastewater networks to the Auckland region; and the operational necessity to locate components of those networks within the CMA.	The proposed works involve regionally significant infrastructure and are to be located in the CMA out of necessity.
11.3.1 Objective	To provide for a wide range of appropriate activities in the coastal marine area.	The proposed works are considered to be an appropriate activity in the CMA as they are for regionally significant infrastructure and have a functional need to locate in the CMA.
11.3.2 Objective	To ensure that efficient use is made of the coastal marine area.	The proposed works are for regionally significant infrastructure for the public rather than individual good and make efficient use of the CMA.
11.4.1 Policy	Activities in the coastal marine area which are not permitted activities by this chapter shall generally be considered appropriate where: a) i) there is a functional need to undertake the activity in the coastal marine area; or ii) they are ancillary to an activity which has a functional need to locate in the coastal marine area; or iii) no reasonable or practicable alternative location exists including any location outside of the coastal marine area; or iv) the activities are for the cultural and traditional needs of Tangata Whenua; and b) any landward development associated with the activities in the coastal marine area can be accommodated; and c) any adverse effects on the environment can be avoided, remedied or mitigated.	The proposed works are considered to be an appropriate activity in the CMA as they are for regionally significant infrastructure and have a functional need to locate in the CMA.
11.4.3 Policy	The relevant provisions of Part III: Values, Chapters 3 to 9 shall be considered in the assessment of any proposed activity (which is the subject of this chapter) in the coastal marine area.	Refer above.
12.3.1 Objective	To provide for appropriate structures in the coastal marine area, while avoiding, remedying, or mitigating	The proposed works are considered to be an appropriate activity in the



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	adverse effects on the environment.	CMA as they are for regionally significant infrastructure and have a functional need to locate in the CMA. Measures have been incorporated into the proposed works to avoid, remedy and/or mitigate adverse effects.
12.4.1 Policy	<p>Subject to the limitations stated in Policies 12.4.2 to 12.4.14, structures in the coastal marine area shall generally be considered appropriate where:</p> <p>a) i) no reasonable or practicable alternative location exists having regard to the efficient use and development of natural and physical resources; or  ii) the structure is proposed for the cultural and traditional needs of Tangata Whenua;</p> <p>b) the purpose for which the structure is required cannot reasonably or practicably be accommodated by existing structures in the coastal marine area; and</p> <p>c) efficient use will be made of the coastal environment by using the minimum area of the coastal marine area necessary for the structure; and</p> <p>d) the structure will not have a significant adverse effect on the adjoining land.</p>	<p>The proposed works involve regional infrastructure that has a functional need to locate in the CMA in order to connect the network between the Auckland Isthmus and Mangere. Alternative locations have been considered and no reasonable or practicable alternative location exists.</p> <p>The purpose of the structures could not be accommodated by existing structures. The proposed works make efficient use of the CMA and will not have a significant adverse effect on the adjoining land.</p>
12.4.2 Policy	The relevant provisions of Part III: Values, Chapters 3 to 9 shall be considered in the assessment of any proposed structure in the coastal marine area.	Refer above.
12.4.3 Policy	Structures in the coastal marine area should as far as practicable, be of an appropriate scale, design, colour and location so as to avoid, remedy or mitigate adverse effects on the coastal environment.	The proposed works will be largely below the seabed/foreshore. The above ground structures are of a modest scale.
12.4.4 Policy	Structures for public or multiple use shall be considered more appropriate than the erection of new structures for individual use.	The proposed works are for regionally significant infrastructure for the public rather than individual good.
12.4.7 Policy	<p>Structures in any Coastal Protection Area 1 may be considered appropriate if they are:</p> <p>a for scientific and research purposes or for public education, and will enhance the understanding and long term protection of the Coastal Protection Area; or</p> <p>b for navigation and safety; or</p> <p>c for habitat maintenance and enhancement; or</p> <p>d structures of benefit to the regional and national</p>	The main tunnel passes beneath a CPA 1 in the Manukau Harbour. This is considered appropriate under part (d) of this policy as it is a structure of regional benefit and it is necessary for it to be in this location in order to convey wastewater from the network in the Auckland Isthmus to the Mangere

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	community and there are no reasonable or practicable alternatives to their location on land or elsewhere in the coastal marine area.	WWTP for treatment.
12.4.9 Policy	In assessing a resource consent application for a publicly owned structure in any Coastal Protection Area 1, regard shall be had to whether the structure is of benefit to the wider local community.	The structure will be of benefit to the wider local community by providing capacity for growth and development and reducing overflows to the environment.
12.4.12 Policy	Structures shall be designed and located taking into account relevant dynamic coastal processes, including the possibility of sea level rise.  The best available estimate of future long-term sea level rise for the locality in question shall be used as a guide in assessing the appropriateness of the proposed location and design of the structure.	The tunnel will be located below the seabed. The design of the surface structures has taken into account coastal processes.
12.4.13 Policy	New pipelines, cables and electric lines should, wherever practicable, be concentrated in a similar location to existing structures of this type.	The nature of the tunnel is such that it cannot practically be located in a similar location to existing structures of its type.
12.4.15 Policy	Structures should be designed to avoid or minimise, as far as practicable, the need for dredging of the foreshore and seabed as part of their construction, maintenance or daily operation.	The structures are not expected to require dredging.
16.3.1 Objective	To provide for appropriate activities, including vegetation removal, which involve the disturbance of the foreshore and seabed, while avoiding, remedying, or mitigating the adverse effects on the coastal environment.	Works in the CMA will involve some disturbance. The surface works will occur in reasonably confined areas and the construction works areas will be minimised to keep disturbance to a minimum.  Removal of mangroves may be required for the works in the CMA at PS 23 (Frederick Street) and for the construction of the EPR structure at Mangere Pump Station. This will be in a small area and will not involve the removal of significant areas of mangroves.
16.4.1 Policy	Any activity other than dredging or extraction (as addressed in Chapters 14 and 15), including vegetation removal, which results in the disturbance of the foreshore and seabed shall be considered	The disturbance is necessary to enable the provision, operation, maintenance and use of infrastructure and there

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	<p>inappropriate unless:</p> <p>a) it can be demonstrated that the disturbance is necessary to:</p> <ul style="list-style-type: none"> <li>i) rehabilitate or restore a coastal ecosystem, or areas identified as having significant geological, ecological or habitat values; or</li> <li>ii) maintain or enhance identified cultural heritage sites or areas of significant historic or archaeological value; or</li> <li>iii) enhance or restore public access to areas used for recreation and to enable water access and navigation in the coastal marine area; or</li> <li>iv) protect public health and safety; or</li> <li>v) maintain or improve navigation and safety; or</li> <li>vi) enable the provision, operation, maintenance and use of lawful structures, infrastructure, such as roads, walkways and/or the efficient functioning of drainage systems, where there is no practicable alternative location outside of the coastal marine area that would achieve a better environmental outcome; or</li> <li>vii) avoid, remedy or mitigate adverse effects caused by natural processes; or</li> <li>viii) enable the carrying out of a lawful activity, consistent with the provisions of this chapter; and</li> </ul> <p>b) there is no practicable alternative to disturbance of the foreshore and seabed; and</p> <p>c) the activity will not result in the permanent loss of any habitat of a threatened, rare or endangered species; and</p> <p>d) the activity will not have a significant adverse effect on Tangata Whenua values identified in accordance with Tikanga Maori; and</p> <p>e) the activity will not be likely to result in significant changes to natural coastal processes, or cause or exacerbate coastal erosion either within the coastal marine area or on adjacent coastal land; and</p> <p>f) the activity will not be likely to result in significant adverse effects on natural character; particularly on natural features or ecosystems; and</p> <p>g) the disturbance is not likely to lead to cumulative adverse effects, including those from regular or maintenance type disturbance in the same area.</p>	<p>is no practicable alternative location outside of the CMA that would achieve a better environmental outcome.</p> <p>The vegetation removal and disturbance will not result in the permanent loss of habitat of threatened, rare or endangered species. It will not have significant adverse effects on tangata whenua values, natural coastal processes, or natural character.</p> <p>The disturbance is not likely to lead to cumulative adverse effects.</p>

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16.4.2 Policy	<p>Activities which are considered appropriate under Policy 16.4.1 shall:</p> <p>a) be undertaken at times of the day or year that will avoid as far as practicable, remedy or mitigate adverse effects on the environment, particularly on:</p> <ul style="list-style-type: none"> <li>i) the growth and reproduction of marine and coastal vegetation and the feeding, spawning and migratory patterns of marine and coastal fauna, including bird roosting, nesting and feeding; and</li> <li>ii) stability of coastal features such as dunes and coastal vegetation; and</li> <li>iii) recreational use of the coastal marine area; and</li> <li>iv) other established activities located in the coastal marine area which are likely to be affected by the disturbance; and</li> <li>v) traditional Maori gathering, collection or harvest of kaimoana; and</li> </ul> <p>b) ensure that the foreshore or seabed is, as far as practicable, reinstated in a manner which is in keeping with the natural character and visual amenity of the area; and</p> <p>c) avoid significant adverse effects on biota caused by the release of contaminants; and</p> <p>d) where the purpose of the activity is to remove vegetation or Pacific Oyster shell from the coastal marine area;</p> <ul style="list-style-type: none"> <li>i) remove only the number of individual plants necessary or clear the minimum area necessary for the purpose; and</li> <li>ii) dispose of the vegetation or shell by an appropriate method or land-based disposal site.</li> </ul>	<p>Works in the CMA at Mangere Pump Station will be timed as far as possible to be carried out at low tide.</p> <p>Erosion and sediment control measures will be used to minimise the release of any contaminants.</p> <p>The temporary construction platform at PS 23 will be removed following construction works and the CMA reinstated.</p> <p>The removal of mangroves will be confined to the minimum area necessary and will not involve the removal of significant areas of mangroves.</p>
16.4.7 Policy	<p>Mangrove removal, other than in a Coastal Protection Area 1, may be considered appropriate where, in addition to the criteria in policy 16.4.1 and 16.4.4:</p> <p>a) mangrove colonisation can be demonstrated to be having an adverse impact on the values of heritage sites, or areas identified as having significant geological, archaeological, ecological or habitat values; or</p> <p>b) Mangrove colonisation can be shown to be obstructing or interfering with areas of high public amenity or use, for example areas formerly or currently used for recreation, water access and navigation; or</p>	<p>The proposed works are for the overall public benefit, consistent with (e).</p>

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	<p>c) Mangrove colonisation is adversely affecting the wading bird feeding and roosting areas identified on the Map Series 8 Sheets 1 to 5; or</p> <p>d) mangrove colonisation is adversely affecting the operation, maintenance and use of lawful structures, infrastructure, such as roads or walkways, and/or the efficient functioning of drainage systems; or</p> <p>e) the proposed removal is in the overall public benefit, as opposed to individual or private benefit; or</p> <p>f) the proposal is in accordance with Policy 16.4.8.</p>	
16.4.9 Policy	Any application for mangrove removal shall include an assessment of the ecological value of mangroves affected, including their significance in the context of the wider estuary or area, and demonstrate that the proposed removal will not have a significant adverse effect on ecological values.	The mangroves are not significant and the proposed removal will not have a significant adverse effect on ecological values.
16.4.10 Policy	The relevant provisions of Part III: Values, Chapters 3 to 9 shall be considered in the assessment of any proposal to disturb the foreshore and seabed under this chapter.	As above.
17.4.2 Policy	The relevant provisions of Part III: Values, Chapters 3 to 9 shall be considered in the assessment of any proposal to deposit any waste or other matter into the coastal marine area.	As above.
17.4.6 Policy	<p>The deposition of solid inorganic waste or other matter into the coastal marine area, shall generally be considered inappropriate unless it can be demonstrated that:</p> <p>a) it is for the purpose of beach nourishment, and the material to be deposited has similar physical characteristics to the sediments at the site; or</p> <p>b) the material to be deposited is appropriate fill for a lawful reclamation, and is in accordance with the provisions of Chapter 13: Reclamation and Drainage; or</p> <p>c) it is for any other purpose which has environmental, scientific, cultural, amenity or social benefits and the adverse effects associated with the deposition can be avoided as far as practicable, remedied or mitigated.</p>	The construction of the temporary construction platform will require the deposition of cleanfill material. This material will be removed on the completion of construction and the CMA reinstated.
20.3.1 Objective	To maintain appropriate water and sediment quality in the coastal marine area and to enhance water and sediment quality where practicable in the parts of the coastal marine area where water and sediment quality is degraded.	The project will result in a significant reduction in wastewater discharges. The emergency pressure relief at Mangere Pump Station is required as a safety measure, but the likelihood of it

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Reference	Objective/Policy	Comment
		<p>operating is very small.</p> <p>The effects of stormwater runoff from the temporary construction platform at PS 23 will be managed through erosion and sediment control measures. A draft erosion and sediment control plan is contained in Part D Technical Report K.</p>
20.3.2 Objective	To adopt the best practicable option for avoiding, remedying or mitigating the adverse effects from stormwater and wastewater discharges on the coastal environment.	<p>The project will result in a significant reduction in wastewater discharges. The emergency pressure relief at Mangere Pump Station is required as a safety measure so that pressure can be safely released from the tunnel without causing damage to the pump station or tunnel structures or causing uncontrolled overflows from shafts along the tunnel alignment, but the likelihood of it operating is very small.</p> <p>The effects of stormwater runoff from the temporary construction platform at PS 23 will be managed through erosion and sediment control measures. A draft erosion and sediment control plan is contained in Part D Technical Report K.</p>
20.4.3 Policy	<p>Any proposal to discharge contaminants or water into the coastal marine area (unless the discharge is prohibited) shall be considered appropriate only if it can be demonstrated that it is the best practicable option (as defined in s2(1) RMA) in terms of preventing or minimising the adverse effects on the environment having considered whether:</p> <p>a) it is practicable or appropriate to discharge to land above Mean High Water Springs;</p> <p>b) there is a community discharge system in place that should be utilised;</p> <p>c) the volume and level of contamination of the discharge has been minimised to the greatest extent practicable;</p> <p>d) the receiving environment is able to assimilate the discharged contaminants and water, with any</p>	<p>The project will result in a significant reduction in wastewater discharges. The emergency pressure relief at Mangere Pump Station is required as a safety measure so that pressure can be safely released from the tunnel without causing damage to the pump station or tunnel structures or causing uncontrolled overflows from shafts along the tunnel alignment, but the likelihood of it operating is very small. The discharge is to a modified</p>

Auckland Council Regional Plan: Coastal		
Reference	Objective/Policy	Comment
	<p>adverse effects being avoided where practicable, remedied or mitigated particularly within:</p> <ul style="list-style-type: none"> <li>i) the areas identified in Tables 8.1 and 8.2 and Map Series 5, Sheets 1-4 (Degraded and Susceptible Areas and Areas of High Ecological Value Susceptible to Degradation) of the Auckland Regional Policy Statement;</li> <li>ii) those Coastal Protection Areas, set out in this Plan, which are based upon ecological rather than geological values:</li> </ul> <p>e) the adverse effects on the present and foreseeable use of the receiving waters have been avoided where practicable, remedied or mitigated, particularly in areas where there is;</p> <ul style="list-style-type: none"> <li>i) high recreational use;</li> <li>ii) relevant initiatives by Tangata Whenua (established under regulations relating to the conservation or management of fisheries) including Taiapure, rahui or Whakatupu areas;</li> <li>iii) the collection of fish and shellfish for consumption;</li> <li>iv) areas of maintenance dredging.</li> </ul> <p>f) any adverse effects on people or communities have been avoided where practicable, or remedied or mitigated;</p> <p>g) adverse effects on the present and reasonably foreseeable use of the receiving waters for recreational purposes and the suitability of fish and shellfish for consumption have been avoided, where practicable, or remedied or mitigated;</p> <p>h) cleaner production methods which would result in the volume and level of contamination of the discharge being minimised, to the greatest extent practicable have been adequately investigated, and where practicable put in place;</p> <p>i) the discharge after reasonable mixing, does not either by itself or in combination with other discharges, give rise to any or all of the following effects:</p> <ul style="list-style-type: none"> <li>i) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;</li> <li>ii) any conspicuous change in the colour or visual clarity;</li> <li>iii) any emission of objectionable odour;</li> <li>iv) any significant adverse effects on aquatic life;</li> <li>v) any significant adverse effects on aesthetics and amenity value.</li> </ul>	<p>environment adjacent to the Mangere WWTP.</p> <p>If the discharge occurs, the event would be expected to cause a short term deterioration in ecological, aesthetic and public health water quality characteristics. No long term significant adverse effects would persist, and any effects would be expected to be quickly remedied through tidal flushing and natural degradation processes.</p>



Auckland Council Regional Plan: Coastal		
Reference	Objective/Policy	Comment
	j) the discharge complies with relevant, appropriate and accepted international or national Codes of Practice and Environmental Guidelines.	
20.4.4 Policy	<p>In addition to the matters set out in Policy 20.4.3, discharges of sewage to the coastal marine area, other than sewage discharges from vessels, shall be avoided unless it can be demonstrated that:</p> <p>a) the option of disposing of sewage directly into the coastal marine area better meets the purpose of the RMA than disposal onto land; and</p> <p>b) there has been consultation with Tangata Whenua in accordance with tikanga Maori and due weight has been given to sections 6, 7 and 8 of the RMA; and</p> <p>c) there has been consultation with the affected community in determining the suitability of the treatment and disposal system; and</p> <p>d) the location and extent of the mixing zone is such that there is no significant adverse effect on any Coastal Protection Area 1, Tangata Whenua Management Area or the existing or reasonably foreseeable use of the receiving waters for recreation or collection of shellfish for human consumption; and</p> <p>e) the adverse effects on the present and reasonably foreseeable use of the receiving waters have been avoided where practicable, remedied or mitigated, particularly in areas where there is;</p> <p>i) high recreational use; or</p> <p>ii) areas of maintenance dredging; or</p> <p>iii) commercial or residential waterfront development.</p>	<p>The project will result in a significant reduction in wastewater discharges. The emergency pressure relief at Mangere Pump Station is required as a safety measure so that pressure can be safely released from the tunnel without causing damage to the pump station or tunnel structures or causing uncontrolled overflows from shafts along the tunnel alignment, but the likelihood of it operating is very small. The discharge is to a modified environment adjacent to the Mangere WWTP (general management area).</p> <p>If the discharge occurs, the event would be expected to cause a short term deterioration in ecological, aesthetic and public health water quality characteristics. No long term significant adverse effects would persist, and any effects would be expected to be quickly remedied through tidal flushing and natural degradation processes.</p> <p>Watercare has undertaken consultation with the community and with tangata whenua on the Central Interceptor scheme.</p>
20.4.13 Policy	Resource consent applicants whose discharges are unable to immediately meet the ERC parameter for contact recreation (Table 20.1.D) should demonstrate the appropriateness of their proposal in a BPO analysis, or alternatively state the timeframe within which they intend to meet the ERC parameter.	
20.4.14 Policy	Resource consent applicants whose discharges are unable to immediately meet the ERC parameter for water quality (Table 20.1.C) should demonstrate the appropriateness of their proposal in a BPO analysis, or alternatively state the timeframe within which they intend to meet the ERC parameter.	

## 5. Auckland Council District Plan (Auckland City Isthmus Section)

Auckland Council District Plan (Auckland City Isthmus Section)		
Reference	Objective/Policy	Comment
2.3.1 Objectives Natural Environment and Resources	<ul style="list-style-type: none"> <li>•To conserve, protect and enhance the district's natural environment.</li> <li>•To conserve the district's resources in order to meet the present and ongoing needs of the community.</li> <li>•To protect the district's resources from significant adverse effects of activities and development.</li> <li>•To protect, preserve and enhance significant habitats and flora.</li> <li>•To conserve the district's significant landscape features.</li> <li>•To conserve significant features of the district's coastline.</li> <li>•To protect outstanding natural features formed by volcanic activity from inappropriate subdivision, use and development.</li> </ul>	<p>The proposed surface works are located in modified environments and not in areas of high natural character. The detailed design of permanent above ground structures will seek to incorporate features into sites as appropriate for the settings e.g. through the use of visually recessive materials. Adverse landscape and visual effects are not expected to be more than minor in the long term. Measures will be put in place to mitigate adverse ecological effects and overall the effects will be minor or able to be sufficiently mitigated. The infrastructure will provide significant environmental benefits through the reduction in overflows to the environment.</p> <p>Outside of the construction sites to be designated the earthworks will be below the surface and therefore will not affect natural character or ecosystems. At the construction sites Erosion and Sediment Control measures will be implemented to manage effects.</p>
2.3.2 Objectives Heritage	<ul style="list-style-type: none"> <li>•To retain and enhance the amenity of the district.</li> <li>•To protect and conserve significant items of cultural heritage.</li> <li>•To provide for further growth in activities while maintaining the quality of the built environment.</li> <li>•To give particular recognition to taonga.</li> <li>•To protect the natural and physical environment of features with significant natural and cultural heritage values.</li> </ul>	<p>There will be temporary effects on residential amenity at some sites neighbouring the construction sites. Measures will be implemented to avoid, remedy, or mitigate these construction effects, such as the use of site fencing, noise barriers, communication with residents etc (refer Part B for specific measures).</p> <p>No known archaeological sites will be affected by the</p>

Auckland Council District Plan (Auckland City Isthmus Section)		
Reference	Objective/Policy	Comment
		works.
2.3.3 Objectives Community	<ul style="list-style-type: none"> <li>•To take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).</li> <li>•To achieve a healthy and safe living environment for the citizens of the district.</li> <li>•To allow for the development of a range of residential neighbourhoods and environments.</li> <li>•To protect and enhance residential amenities.</li> <li>•To give recognition to the status of the tangata whenua and provide for their interest.</li> <li>•To encourage the wide use and provision of education, health, recreation and community resources and facilities.</li> <li>•To encourage the development of community identity and distinctiveness.</li> <li>•To allow maximum flexibility for individual site development without adversely impacting on neighbouring activities.</li> <li>•To encourage compact residential and mixed use developments within specified growth areas.</li> </ul>	<p>The project will provide capacity in the system to support the future growth and development of Auckland in a manner consistent with the strategic growth containment policies of the relevant plans.</p> <p>The project will provide important regionally significant infrastructure that directly supports the social, economic, environmental and cultural wellbeing of the whole community.</p> <p>Watercare is engaging with iwi to help identify any potential effects of the project on tangata whenua or cultural heritage matters. Issues raised, and how these have been addressed, are outlined in Section 8 of this AEE.</p>
4A.4.2 Objectives	<ul style="list-style-type: none"> <li>•To maintain levels of infrastructure which provide for the citizens of the district.</li> <li>•To ensure that activities and development recognise the constraints of servicing capabilities.</li> <li>•To monitor the development of the Isthmus so that growth may be balanced with the environmental capacity of the district.</li> <li>•To allow for the provision of new network utility services whilst mitigating adverse environmental effects.</li> </ul>	<p>The proposed works will improve the wastewater network and provide an important network utility service to provide for the growth and development of Auckland and improve the environment through the reduction of wastewater overflows.</p>
4A.4.3 Policies	<ul style="list-style-type: none"> <li>•By providing for the continued existence and maintenance of established network utility services.</li> <li>•By providing for new network utility services, provided that any adverse effects on amenity values are avoided, remedied or mitigated.</li> <li>•By requiring financial contributions from developers and subdividers for the provision of network utility services necessary for people's health, well-being and safety and to avoid, mitigate or remedy any adverse effects of the activities on the environment.</li> <li>•By ensuring that proposed network utility services which may create significant adverse effects on the environment are subjected to an assessment</li> </ul>	

Auckland Council District Plan (Auckland City Isthmus Section)		
Reference	Objective/Policy	Comment
	<p>procedure and that any adverse effects are avoided, remedied or mitigated where practical.</p> <ul style="list-style-type: none"> <li>•By recognising existing legislative provisions which apply to network utility services, and where the Council is empowered to do so, applying conditions to the installation of those services to meet the requirements of Part II of the Act.</li> <li>•By making suitable provision for network utility services corridors through the Isthmus.</li> <li>•By monitoring the capacity of the network utility services for which the Council has prime responsibility so as to enable the adverse effects of land use activities on those services to be avoided, remedied or mitigated.</li> </ul>	
5B.4.1 Coastal Landscape	<p><b>Objective:</b> To conserve, protect and enhance the natural and physical resources and preserve the natural character of the coastal environment for the benefit of the City and the nation.</p> <p><b>Policies:</b></p> <ul style="list-style-type: none"> <li>•By protecting critical elements such as significant landforms, scenic values, trees, bush and cultural heritage values.</li> <li>•By ensuring that new buildings or redevelopment of existing buildings in the Coastal Management Area do not adversely affect landscape values and have a demonstrable public benefit.</li> <li>•By working with neighbouring local authorities to achieve integrated landscape protection along the Isthmus coast.</li> <li>•By using various measures including esplanade areas to achieve conservation of the coast and streams.</li> </ul>	<p>The main tunnel will pass underneath the coastal management area and will therefore not be visible.</p> <p>Some vegetation removal is required at PS 23 and there will be permanent above ground structures. Mitigation measures, such as replanting and the use of appropriate design and treatment of permanent features at the site are proposed to assist with integrating the features into the landscape.</p>
5B.4.2 Coastal Habitats	<p><b>Objective:</b> To conserve, protect and enhance the flora and habitats of the coastal environment.</p> <p><b>Policies:</b></p> <ul style="list-style-type: none"> <li>•By ensuring that development and activities in the Coastal Management Area do not have an adverse effect on recognised habitats; minimise the need for vegetation removal; and promote suitable vegetation of indigenous species.</li> <li>•By restricting access and creating buffers to protect sensitive habitats. (Refer ANNEXURE 2 for listed</li> </ul>	

Auckland Council District Plan (Auckland City Isthmus Section)		
Reference	Objective/Policy	Comment
	<p>significant environment features).</p> <ul style="list-style-type: none"> <li>•By using various measures including esplanade areas to protect and conserve the coastal habitats.</li> <li>•By opposing further reclamation of the coastal marine area unless any specific proposal can demonstrate that land based alternatives do not exist, and that the proposed reclamation is an efficient use of natural and physical resources.</li> </ul>	
5B.4.3 Water Quality	<p><b>Objective:</b> To maintain and, where practicable, enhance the water quality of the Waitemata and Manukau Harbours and all water bodies and waterways within the district.</p> <p><b>Policies:</b></p> <ul style="list-style-type: none"> <li>•By ensuring that appropriate controls are applied to activities to prevent hazardous substances contaminating waterways.</li> <li>•By requiring adequate equipment and facilities to prevent runoff or spillage from industries located within the Coastal Management Area.</li> <li>•By controlling the effects of development, earthworks and the removal of vegetation so as to minimise pollution or sedimentation of coastal waters.</li> <li>•By securing appropriate buffers along waterways and the coast where practicable.</li> <li>•By controlling the surface drainage of properties so as to minimise the erosion of cliff edges and land adjoining coastal waters. (Refer to Clause 4A.1E).</li> <li>•By using various measures including esplanade areas to protect and enhance the water quality of the coast and streams.</li> </ul>	<p>The proposed works will have positive effects on water quality in the Waitemata Harbour through the reduction in wastewater overflows.</p> <p>The construction of the tunnel will only involve surface disturbance at a limited number of sites and erosion and sediment control measures will be used to minimise adverse effects on water quality due to construction related disturbance.</p> <p>The use of hazardous substances on site will be managed through provisions in the CMP.</p>
5B.4.6 Use and Development	<p><b>Objective:</b> To ensure that use, development and protection of the natural and physical resources of the Auckland Isthmus coastal environment are achieved in a fully integrated manner which preserves the natural character of the coastal environment.</p> <p><b>Policies:</b></p> <ul style="list-style-type: none"> <li>•By recognising the integrated nature of the coastal environment and the need to adopt a precautionary or conservative approach to use and development in this area.</li> <li>•By requiring use and development in the Coastal Management Area to have a regard to the actual or potential effects of the proposed activity on the coastal environment and especially the coastal</li> </ul>	<p>The proposed works are consistent with the objectives and policies of the New Zealand Coastal Policy Statement and the Auckland Regional Plan: Coastal as set out in Part A and in Section 4 of this assessment.</p>

Auckland Council District Plan (Auckland City Isthmus Section)		
Reference	Objective/Policy	Comment
	<p>marine area.</p> <p>•By ensuring use and development in the Coastal Management Area is not inconsistent with any New Zealand Coastal Policy Statement or Regional Policy Statement or Plan.</p>	
Objective 9.6.1.1	<p>Open Space 1 (Conservation)</p> <p>Objective: To provide for the conservation and protection of areas of particular scenic, heritage, natural or habitat value.</p> <p>Policies:</p> <p>...</p> <p>By restricting earthworks and the removal of native trees and bush.</p> <p>....</p>	<p>The tunnel will pass beneath an area of Open Space 1 (Belfast Reserve). However, there are no surface works in the Open Space 1 zone and the works will not affect the values of the area.</p>
Objective 9.6.2.1	<p>Open Space 2 (Informal Recreation)</p> <p>Objective: To protect appropriate areas of open space for the enhancement of the environment and the enjoyment of informal recreation.</p> <p>Policies:</p> <p>...</p> <p>By restricting earthworks and the removal of native trees and bush.</p>	<p>The tunnel will pass beneath the Open Space 2 zone but will be well below the ground and will not affect the recreational values of the zone.</p> <p>The surface works at Open Space 2 zoned sites have been assessed in Part A and B of this AEE. The works involve earthworks and the removal of native trees and there will be temporary effects on recreation during the works. Site reinstatement will be undertaken in consultation with Auckland Council and will involve mitigation measures such as replanting and reinstatement of facilities. Permanent structures will generally be flush with the ground, but where above ground structures are required, these will be designed to minimise effects on the parks and reserves.</p>



## 6. Auckland Council District Plan (Manukau Section)

Auckland Council District Plan (Manukau Section)		
Reference	Objective/Policy	Comment
Objective 7.3.1	To protect the environment of the city including heritage, visual, aural and other amenity values from adverse effects of network utility services and enable efficient traffic movements as far as practicable.	Measures will be used to mitigate the effects of construction, such as traffic management measures, and mobile noise barriers where necessary. The proposed trenching works between Kiwi Esplanade and Witla Court will be largely within the road reserve and a segment through reserve.
Objective 7.3.2	To protect people from adverse effects that network utility services may have on people's health and safety.	
Objective 7.3.3	To enable the efficient and effective provision of network utility services to support the development and functioning of other activities, promote sustainable management of resources, and to protect the operational efficiency and safety of network utility services in the City.	The proposed works will enable the efficient and effective provision of network utility services and will have significant positive effects. The connection from Kiwi Esplanade to Witla Court will connect Western Interceptor/Mangere Bridge Branch Sewer to the main tunnel.
Policy 7.4.1	Network utility services should be sited and designed in such a way that (a) minimises adverse effects on the quality of the visual and other amenity values of the environment as much as practicable; (b) enables reasonable on-site amenity regarding design, landscaping and screening for neighbouring properties; (c) avoids adverse effects on sites, buildings, places or areas of heritage and archaeological value; (d) is sensitive to adjacent activities; (e) is timely, and is of adequate technical standards and capacities to support the potential scale and timing of development in the area served by the particular network; (f) allows for the provision and efficient operation of other network utility services to adequate technical standards and capacities to support the needs of the ultimate areas they are required to serve.	The works are part of regionally significant infrastructure which will help provide capacity for growth and development.  The works at Kiwi Esplanade will be designed to integrate with the site with appropriate landscaping and treatment of permanent structures.  The proposed trenching works between Kiwi Esplanade and Witla Court will be largely within the road reserve and will therefore avoid adverse effects on sites, buildings, places or areas of heritage or archaeological value.
Policy 7.4.2	Network utility services should be installed, operated and maintained in such a way as to: (a) avoid, remedy or mitigate the potential discharge of contaminants to the environment; (b) avoid, remedy or mitigate potential adverse effects on the health, safety and wellbeing of	The effects, including the avoidance, remediation, and mitigation of effects of the main tunnel and link sewer 4 are addressed throughout the AEE report, including Part A



<b>Auckland Council District Plan (Manukau Section)</b>		
<b>Reference</b>	<b>Objective/Policy</b>	<b>Comment</b>
	people and communities.	Sections 11 and 12.
Policy 7.4.3	Network utility services shall be sited in such a way that: (a) avoids adverse effects on network utility services in the vicinity; (b) avoids or minimises adverse effects on the safety of other network utility services; (c) minimises disruption and interference to other network utility services.	
Objective 9.3.1	To enable land modification, development and subdivision to proceed in a manner that will maintain or enhance the environmental qualities of the environment.	Erosion and Sediment Control measures will be implemented for the duration of the proposed works to prevent the discharge of sediment laden water to watercourses. Measures will be in accordance with the Auckland Regional Council TP90 Guideline. Indicative measures are shown in Technical Report K.
Objective 9.3.4	To ensure that land modification, development and subdivision do not create or exacerbate natural hazards, and that they do not increase the potential for natural hazards to adversely affect the environment.	The works are not expected to create or exacerbate natural hazards.
Objective 6.3.1	To preserve or protect the heritage values of a diverse and representative range of natural, physical and cultural resources within Manukau.	The removal of the existing pump station in Kiwi Esplanade reserve will involve works in the dripline of and removal of protected trees. The overall effects of this work will be positive and effects of tree removal can be mitigated by replanting if necessary.  The LS 4 trenching in the dripline of trees will be managed through the implementation of tree protection measures.
Policy 6.4.2	Adverse effects of development on the City's heritage resources should be avoided, remedied or mitigated.	
Objective 15.3.1	To ensure that the provision, development, and distribution of public open space enables current and future residents, workers, and visitors to Manukau City to provide for their social, cultural, spiritual, physical and psychological health and well being.	The removal of the existing pump station structure in Kiwi Esplanade reserve will have positive effects on the use and enjoyment and amenity values of this public open space. Adverse effects during
Objective 15.3.4	To ensure the effective, efficient and safe use of public open space.	

Auckland Council District Plan (Manukau Section)		
Reference	Objective/Policy	Comment
Objective 15.3.6	To maintain and enhance the amenity values of public open space areas.	demolition will be of a temporary nature only.  The trenching of Link Sewer 4 through the reserve will result in temporary adverse effects of a short term nature and long term there will be no noticeable effects on the public open space.

## Appendix C – Schedule of Properties



## Appendix C: Schedule of properties<sup>1</sup>

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 11 DP 168863	NA102C/1000	859 GREAT NORTH ROAD	Auckland	Auckland Council
Lot 1 DP 88398	370920, NA45D/561	805 GREAT NORTH ROAD	Auckland	
Lot 10 DP 168863	NA102C/999	751 GREAT NORTH ROAD	Auckland	Regional Facilities Auckland Limited
Lot 12 DP 168863	NA103A/1	731 GREAT NORTH ROAD	Auckland	Regional Facilities Auckland Limited
Lot 1 DP 168863	NA102C/992	985 GREAT NORTH ROAD	Auckland	Auckland Council
Lot 90 DP 39331	NA26B/363	32B MIRANDA STREET	Avondale	Auckland Council
Lot 3 DP 37517	NA9B/1097	734 NEW NORTH ROAD	Avondale-Grafton	The Baptist Union of New Zealand
Lot 2 DP 60475	NA15D/816	766 NEW NORTH ROAD	Avondale-Grafton	Alberton Village Property Limited
Part Allot 171 Sec 10 SBRS OF Auckland		751-773 NEW NORTH ROAD	Avondale-Grafton	
Part Lot 1 DP 60475	NA16D/1218	760 NEW NORTH ROAD	Avondale-Grafton	Anne Patricia Duncan, Kevin Patrick McDonald, Ross William Duncan
Lot 23 DP 40504	NA1114/62	43 BOUNDARY ROAD	Blockhouse Bay	Hui Xia Song
Lot 28 DP 48765	NA2033/85	56 BOUNDARY ROAD	Blockhouse Bay	Maureen Lata Nand
Lot 22 DP 40504	NA1873/21	39 BOUNDARY ROAD	Blockhouse Bay	Majulaben Ishwarlal Patel
Lot 27 DP 48765	NA15B/139	54 BOUNDARY ROAD	Blockhouse Bay	Elizabeth Smith
Lot 26 DP 48765	NA5D/132	52 BOUNDARY ROAD	Blockhouse Bay	Nirmala Ramanlal, Ramanlal Bhukan
Lot 9 DP 202206	NA129B/930	66A DUNDALE AVENUE	Blockhouse Bay	Krishnamoorthy Subramaniam
Lot 1 DP 51763	NA1D/734	40 DUNDALE AVENUE	Blockhouse Bay	Gillian Faye Clark
Lot 3 DP 42398	NA1139/260	44 DUNDALE AVENUE	Blockhouse Bay	Beverley Chamberlain, Robert Stuart Chamberlain
Lot 6 DP 202206	NA129B/927	62C DUNDALE AVENUE	Blockhouse Bay	The Christian and Missionary Alliance of New Zealand
Lot 18 DP 40504	NA1376/40	83 DUNDALE AVENUE	Blockhouse Bay	Hector Desouza, Lorraine Desouza
Lot 19 DP 40504	NA1130/9	85 DUNDALE AVENUE	Blockhouse Bay	Khadija Yusuf Ismail, Mohammed Iqbal Ismail, Valibhai Ismail

<sup>1</sup> Data from CRS Database, 26 June 2012.

<sup>2</sup> Ownership details are not available for some properties, for example, some Crown owned properties and properties where there are multiple titles.

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 21 DP 40504	NA1664/8	89 DUNDALE AVENUE	Blockhouse Bay	Carson Zuo Liang Duan, Ellen Cuiqing Ma
Lot 7 DP 202206	NA129B/928	62B DUNDALE AVENUE	Blockhouse Bay	Brian Savio D'Souza, Elsa D'Souza
Lot 10 DP 202206	NA129B/931	66B DUNDALE AVENUE	Blockhouse Bay	Rasigan Moodley, Venesha Moodley
Lot 8 DP 202206	NA129B/929	62A DUNDALE AVENUE	Blockhouse Bay	Shakuntla Ramanjam, Vishnu Ramanjam
Lot 1 DP 42398	NA110A/411, NA130D/54	34A DUNDALE AVENUE	Blockhouse Bay	
Lot 20 DP 40504	NA1133/81	87 DUNDALE AVENUE	Blockhouse Bay	Carson Duan, Ellen Ma
Lot 1 DP 329997	122687	60 DUNDALE AVENUE	Blockhouse Bay	Sandip Vishnubhai Patel, Smitha Sandip Patel
Lot 2 DP 329997	122688	54 DUNDALE AVENUE	Blockhouse Bay	Nirmalaben Magan Kika, Vaeeshaliben Nandubhai Patel
Lot 3 DP 329997	122689	58 DUNDALE AVENUE	Blockhouse Bay	Aniruddha Dayanand Sawant, Neelam Aniruddha Sawant
Lot 4 DP 329997	122690	56 DUNDALE AVENUE	Blockhouse Bay	Krishna Reddy Kura, Vandana Vanga
Lot 15 DP 19166	NA981/108	34 HERTFORD STREET	Blockhouse Bay	Hanshen Wang
Lot 15 DP 39320	NA22C/142	23 HERTFORD STREET	Blockhouse Bay	Housing New Zealand Limited
Lot 1 DP 311734	46361	32 HERTFORD STREET	Blockhouse Bay	Roween Jokhan
Lot 2 DP 311734	46362	32A HERTFORD STREET	Blockhouse Bay	Bhavik Kumar Bhatt, Daxaben Bhatt
Lot 1 DP 318004	70537	36 HERTFORD STREET	Blockhouse Bay	Gregory Alan Whittaker
Lot 7 DP 71723	NA39A/582, NA39A/583	11 LANDSEER PLACE	Blockhouse Bay	
Lot 6 DP 71723	NA39B/1104, NA39B/1105, NA39B/1106	13 LANDSEER PLACE	Blockhouse Bay	
Lot 8 DP 71724	NA36D/20, NA36D/21	9 LANDSEER PLACE	Blockhouse Bay	
Lot 11 DP 71724	NA33B/714, NA33B/715	3 LANDSEER PLACE	Blockhouse Bay	
Lot 1 DP 71724	NA36B/540, NA36B/541, NA54A/1396	4 LANDSEER PLACE	Blockhouse Bay	
Lot 9 DP 71724	NA27D/1133	7 LANDSEER PLACE	Blockhouse Bay	Freddie Mitchell Hounng-Lee, Gail Hounng-Lee
Lot 10 DP 71724	NA34B/1377, NA34B/1378	5 LANDSEER PLACE	Blockhouse Bay	
Lot 2 DP 105770	NA59A/474	38 MARGATE ROAD	Blockhouse Bay	Josephine Marjorie Smith
Lot 3 DP 43012	NA1654/21	7 MARGATE ROAD	Blockhouse Bay	Faamalua Peteru, Ruta Peteru
Lot 6 DP 39320	NA19A/38	10 MARGATE ROAD	Blockhouse Bay	Ben Tamaso Riggs, Pamela Wendy Atkins

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 1 DP 105770	NA59A/473	38A MARGATE ROAD	Blockhouse Bay	Brendan John Scully, Doreen Mere Scully
Lot 3 DP 77710	NA34A/212	1/38-3/38 MARGATE ROAD	Blockhouse Bay	Brett James Ramsay, Diane Sandra Ramsay
Lot 2 DP 86640	NA44B/469	56 MARGATE ROAD	Blockhouse Bay	Peter Roy Fissenden
Lot 14 DP 39320	NA22C/141	28 MARGATE ROAD	Blockhouse Bay	Kalolaine Lua Skeen
Lot 4 DP 43012	NA73D/258, NA73D/259, NA73D/260, NA73D/261, NA73D/262	9 MARGATE ROAD	Blockhouse Bay	
Lot 7 DP 39320	243395, NA76A/933	12 MARGATE ROAD	Blockhouse Bay	
Lot 1 DP 43012	NA48B/403, NA48B/404	3 MARGATE ROAD	Blockhouse Bay	
Lot 2 DP 204131	NA132D/477	5B MARGATE ROAD	Blockhouse Bay	Qingping Wang
Lot 1 DP 204131	NA132D/476	5A MARGATE ROAD	Blockhouse Bay	Renuka Vishal Dhankar, Vishal Singh Dhankar
Lot 3 DP 199985	NA128B/813, NA128B/814	34A MARGATE ROAD	Blockhouse Bay	
Lot 1 DP 199985	NA128B/750	36 MARGATE ROAD	Blockhouse Bay	Shaeeda Malka Rizwana Bibi Khan, Shamim Nur Khan, Tazmin Nisha Khan
Lot 8 DP 19166	NA8B/973	46 MARGATE ROAD	Blockhouse Bay	Ana Mapa Pomee, Anthony Eleminoti Pomee, Stephen Hames
Lot 1 DP 180239	NA111A/824	34 MARGATE ROAD	Blockhouse Bay	Oliver Willem Van Heusden, Vulcan Trustee Co (2009) Limited
Lot 2 DP 88724	NA43C/252	1 MARGATE ROAD	Blockhouse Bay	Roselyn Ann Moonie
Lot 46 DP 39320	NA62B/1188, NA76C/75	14 MARGATE ROAD	Blockhouse Bay	
Lot 9 DP 39320	NA1111/137	18 MARGATE ROAD	Blockhouse Bay	Joyce Betty Bree
Lot 1 DP 19166	NA981/114	32A MARGATE ROAD	Blockhouse Bay	Hiroyoshi Takamatsu
Lot 8 DP 39320	NA1111/110	16 MARGATE ROAD	Blockhouse Bay	Alice Davis
Lot 2 DP 199985	NA128B/751	34C MARGATE ROAD	Blockhouse Bay	Shaeeda Bibi Khan, Shamim Khan
Lot 12 DP 19166	NA442/29, NA71B/721, NA71B/722	54 MARGATE ROAD	Blockhouse Bay	
Lot 1 DP 118595	NA68A/908, NA78B/935	52 MARGATE ROAD	Blockhouse Bay	
Lot 5 DP 19166	NA1111/238	40 MARGATE ROAD	Blockhouse Bay	Lum Joe Ng
Lot 1 DP 76106	NA101C/46, NA89A/75	50 MARGATE ROAD	Blockhouse Bay	
Lot 1 DP 205286	NA132C/349	24 MARGATE ROAD	Blockhouse Bay	Dongfeng Chen, Xuecheng Song



Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 2 DP 205286	NA132C/350	24A MARGATE ROAD	Blockhouse Bay	Kathleen Mary Tassie Latchoumanane Sockalingam, Shanthi Bai Latchoumanane
Lot 2 DP 318004	70538	30 MARGATE ROAD	Blockhouse Bay	Aaron Cheah, Kelly Tye
Lot 1 DP 352116	213815	26A MARGATE ROAD	Blockhouse Bay	Hao Ye, Xiaoxing Liu
Lot 2 DP 352116	213816	26 MARGATE ROAD	Blockhouse Bay	Housing New Zealand Limited
Lot 1 DP 345580	186759	20 MARGATE ROAD	Blockhouse Bay	Housing New Zealand Limited
Lot 2 DP 345580	186760	20A MARGATE ROAD	Blockhouse Bay	Housing New Zealand Limited
Lot 3 DP 345580	186761	20B MARGATE ROAD	Blockhouse Bay	Housing New Zealand Limited
Lot 4 DP 345580	186762	22 MARGATE ROAD	Blockhouse Bay	Housing New Zealand Limited
Lot 1 DP 360006	244057	42 MARGATE ROAD	Blockhouse Bay	Huma Shaikh, Mohammed Javed Iqbal Shaikh
Lot 2 DP 360006	244058	42A MARGATE ROAD	Blockhouse Bay	Ignatius Al Antony Baviah, Ludes Hellen Corray
Lot 3 DP 360006	244059	42B MARGATE ROAD	Blockhouse Bay	Jaymesh Prabhudas Devia, Parvin Devia
Lot 4 DP 360006	244060	42C MARGATE ROAD	Blockhouse Bay	Wen Wang
Lot 5 DP 360006	244061	44 MARGATE ROAD	Blockhouse Bay	Nisha Chandiramani
Lot 2 DP 179090	NA117B/925, NA117B/926, NA117B/927, NA117B/928	10/17 MATATA STREET	Blockhouse Bay	
Lot 3 DP 179090	NA115C/595, NA115C/596, NA115C/597, NA115C/598	6/17 MATATA STREET	Blockhouse Bay	
Lot 11 DP 40205	NA1110/245	61 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Manilal Hira
Lot 4 DP 40052	NA1058/105	77 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Ann Margaret Cameron, Ross Hamish Cameron
Lot 13 DP 40205	NA1063/249	65 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Aruna Manhar Patel, Manhar Motiram Patel
Part Lot 16 DP 40205	NA2052/23	71 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Her Majesty the Queen
Lot 12 DP 40205	NA1063/250	63 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Indravadan Morar
Lot 18 DP 40205	NA101D/149, NA105C/283	75 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 10 DP 40205	NA113C/591, NA96B/262	59 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	
Lot 14 DP 40205	NA19A/901, NA19A/902, NA19A/903, NA19A/904	67 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	
Lot 1 DP 141985	NA84B/47	11 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Transpower New Zealand Limited
Lot 17 DP 40205	NA1058/14	73A WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	Faiyaz Gaznabi Khan, Zabeena Gulnaaz
Lot 1 DP 76882	NA40B/676, NA40B/677, NA40B/678	79 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	
Lot 2 DP 76882	NA34D/1498, NA34D/1499, NA34D/1500, NA36A/1	81 WHITE SWAN ROAD	Blockhouse Bay-Mt Roskill	
Lot 1 DP 88724	NA51C/1342, NA51C/1343, NA51C/1344	356 BLOCKHOUSE BAY ROAD	Blockhouse Bay-Waterview	
Lot 35 DP 39331	NA45A/326	337 BLOCKHOUSE BAY ROAD	Blockhouse Bay-Waterview	Edward Potea Ward, Reta Elsie Ward
Part Lot 41 DP 39320		340 BLOCKHOUSE BAY ROAD	Blockhouse Bay-Waterview	
Lot 3 DP 40894	NA94C/1, NA94C/2	362 BLOCKHOUSE BAY ROAD	Blockhouse Bay-Waterview	
Part Lot 1 DP 9701	NA893/150	353 BLOCKHOUSE BAY ROAD	Blockhouse Bay-Waterview	The Salvation Army Property (New Zealand) Trust Board
Lot 2 DP 72166	NA100D/777, NA88D/511, NA96B/259	44 BELFAST STREET	Hillsborough	
Lot 11 DP 19403	NA467/197	13 BELFAST STREET	Hillsborough	Feng Zheng, Guo Ying Zhang
Lot 10 DP 19403	NA642/221	11 BELFAST STREET	Hillsborough	Bevan Russell Clarke, Joanna Marie Joyce
Lot 14 DP 19403	NA638/251	19 BELFAST STREET	Hillsborough	Trevor Graham Alborough
Lot 16 DP 19403	NA824/132	23 BELFAST STREET	Hillsborough	Richard John Arts, Sarah Judith Knights
Lot 9 DP 19403	NA639/235	9 BELFAST STREET	Hillsborough	Criss Edward Olsen, Karen Dorothy Olsen
Lot 17 DP 19403	NA645/220	25 BELFAST STREET	Hillsborough	Michelle Leung, Rueben Lee Fifield
Lot 18 DP 19403	NA636/264	27 BELFAST STREET	Hillsborough	Anna Florence Elizabeth Simmons, Leslie Robert Simmons
Lot 1 DP 37658	NA984/142	40 BELFAST STREET	Hillsborough	Julie Margaret Collis, William Frederick Collis
Lot 20 DP 19403	NA490/243	31 BELFAST STREET	Hillsborough	Cheung Chor Chun Stella, Luk Chiu Kong

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 13 DP 19403	NA645/219	17 BELFAST STREET	Hillsborough	Elizabeth Helen Shaw, Jonathon Henry Shaw
Lot 1 DP 72166	NA100D/777, NA88D/511, NA96B/259	42 BELFAST STREET	Hillsborough	
Lot 12 DP 19403	NA624/242	15 BELFAST STREET	Hillsborough	Henry Hong
Lot 19 DP 19403	NA648/105, NA83B/33	29 BELFAST STREET	Hillsborough	
Lot 15 DP 19403	NA638/250	21 BELFAST STREET	Hillsborough	Andrew Maurice Clifford, Karen Lee White
Lot 33 DP 87069	NA131B/971, NA60C/28	46 BELFAST STREET	Hillsborough	
Lot 3 DP 24720		18-38 BELFAST STREET	Hillsborough	
Lot 21 DP 39667	NA3C/896	5 EATON ROAD	Hillsborough	Alice Patricia Blundell, David Wayne McDowell
Lot 1 DP 204128	NA132D/469	2A EATON ROAD	Hillsborough	Christine Chenon, Michel Chenon
Lot 20 DP 39667	NA1129/217	3 EATON ROAD	Hillsborough	Leslie Charles Barling, Maureen Anne Barling
Lot 2 DP 204128	NA132D/470	2B EATON ROAD	Hillsborough	Chien-Hua Wang
Lot 3 DP 204128	NA132D/471	2C EATON ROAD	Hillsborough	Weian Su, Weichao Su, Xiulong Zhou
Lot 1 DP 161858	NA97C/394	39 FREDERICK STREET	Hillsborough	Watercare Services Limited
Lot 1 DP 55000	NA8B/606	37 FREDERICK STREET	Hillsborough	Alexander William Weir, SDM Trustee Company (2005) Limited
Lot 2 DP 183546	NA114B/877	48 FREDERICK STREET	Hillsborough	Ping Yang, Xin Lu
Lot 1 DP 315571	61191	1/41 FREDERICK STREET	Hillsborough	Christine Skelton, Norman Thomas Gilroy Skelton
Lot 2 DP 315571	61192	2/41 FREDERICK STREET	Hillsborough	Ranjani Pannila, Sarathchandra Perera Pannila
Lot 3 DP 315571	61193	3/41 FREDERICK STREET	Hillsborough	Christopher George Wright, Hira Chhotu, Indira Chhotu
Lot 4 DP 315571	61194	4/41 FREDERICK STREET	Hillsborough	Christopher George Wright, Hira Chhotu, Indira Chhotu
Lot 5 DP 315571	61195	5/41 FREDERICK STREET	Hillsborough	Christopher George Wright, Hira Chhotu, Indira Chhotu
Lot 6 DP 315571	61196	6/41 FREDERICK STREET	Hillsborough	Lekamage Thusitha Prasanna Perera, Sellapperumage Kamini Dhammika Perera
Lot 32 DP 39667	NA112C/751, NA112C/752	10 OLSEN AVENUE	Hillsborough	
Lot 1 DP 178370	NA110A/100	36A OLSEN AVENUE	Hillsborough	Edwin Rajah Devasirvatham, Shahrizad Yusoff
Lot 30 DP 39667	NA1329/73	14 OLSEN AVENUE	Hillsborough	Anthony Bruce Teutenberg
Lot 25 DP 39667	NA57C/36, NA57C/37	24 OLSEN AVENUE	Hillsborough	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 18 DP 39667	NA1089/153	30 OLSEN AVENUE	Hillsborough	Glenys Anne Knowles, Raymond Leslie Knowles
Lot 1 DP 55685	NA17A/1462	32A OLSEN AVENUE	Hillsborough	Christopher Rhys Markley
Lot 24 DP 39667	NA94C/254, NA94C/255 NA115A/587, NA115A/588, NA115A/589	26 OLSEN AVENUE	Hillsborough	
Lot 19 DP 39667	NA7C/175	28 OLSEN AVENUE	Hillsborough	
Lot 2 DP 55685	NA1146/98	32 OLSEN AVENUE	Hillsborough	Bing Quan Zhu, Jiezhen Mai
Lot 26 DP 39667	NA37B/80, NA37B/83, NA45A/122, NA61A/579	22 OLSEN AVENUE	Hillsborough	David Shui Kam Chung, Hung Loong Chung, Minnie Chung
Lot 16 DP 39667	NA48D/993, NA48D/994, NA48D/995, NA48D/996	34 OLSEN AVENUE	Hillsborough	
Part Lot 36 DP 39667	NA1101/191	2 OLSEN AVENUE	Hillsborough	
Lot 31 DP 39667	NA1174/63	12 OLSEN AVENUE	Hillsborough	Chin Leong Kok
Lot 28 DP 39667	NA1081/174	18 OLSEN AVENUE	Hillsborough	Bruce William Eaddy, Jocelyn Mary Eaddy
Lot 34 DP 39667	NA88D/740, NA91B/464	6 OLSEN AVENUE	Hillsborough	Qing Wei Pan, Shu Tang
Lot 29 DP 39667	NA110A/101	16 OLSEN AVENUE	Hillsborough	
Lot 2 DP 178370	NA106B/884, NA110B/704	36C OLSEN AVENUE	Hillsborough	Jane Phillipa McCormack, Neil Colin McCormack
Lot 27 DP 39667	190096	20 OLSEN AVENUE	Hillsborough	
Lot 1 DP 346248	190097	8 OLSEN AVENUE	Hillsborough	Heather Muriel Glen, Peter Port
Lot 2 DP 346248	281999	8A OLSEN AVENUE	Hillsborough	Rohit Robert Prasad, Sanjeeta Prasad
Lot 1 DP 369440	282000, 517355	4 OLSEN AVENUE	Hillsborough	David William Hogg, Jennifer Kaye Hogg, Kevin Patrick McDonald
Lot 2 DP 369440	NA44D/481 NA56C/1240, NA56C/1241	4A OLSEN AVENUE	Hillsborough	
Lot 12 DP 87068	NA44D/474	18 PALLISTER DRIVE	Hillsborough	Christine Anne Coombes, Gavin Wallace Coombes
Lot 6 DP 87068	NA114B/876	6 PALLISTER DRIVE	Hillsborough	
Lot 5 DP 87068	NA44D/483	4 PALLISTER DRIVE	Hillsborough	Crawford Country Limited
Lot 1 DP 183546	NA44D/471	3 PALLISTER DRIVE	Hillsborough	Edward Stephen Simmons, Jennifer Lisa Simmons
Lot 31 DP 87068		5 PALLISTER DRIVE	Hillsborough	Veronica Rongling Zane
Lot 2 DP 87068		2 PALLISTER DRIVE	Hillsborough	Mt. Roskill Borough Council

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 9 DP 87068	NA44D/478	12 PALLISTER DRIVE	Hillsborough	David Zheng, Sophy Li
Lot 10 DP 87068	NA44D/479	14 PALLISTER DRIVE	Hillsborough	Jane Marie Davis, Raymond Tutu Davis
Lot 7 DP 87068	NA44D/476	8 PALLISTER DRIVE	Hillsborough	Joseph Warrington Van Ross, Yvette Doreen Rosebud Van Ross
Lot 18 DP 87069	NA44D/489	30 PALLISTER DRIVE	Hillsborough	Matthew John Hunt, Sharyn Claire Hunt
Lot 17 DP 87069	NA44D/488	28 PALLISTER DRIVE	Hillsborough	KS Tah Limited, Kevin Pirih Whiu, Selena Mona Meiklejohn-Whiu
Lot 8 DP 87068	NA44D/477	10 PALLISTER DRIVE	Hillsborough	Chun Sheng Meng
Lot 13 DP 87068	NA44D/482	20 PALLISTER DRIVE	Hillsborough	Amanda Louise Lowe, Jason Scott Lowe
Lot 19 DP 87069	NA44D/490	32 PALLISTER DRIVE	Hillsborough	Leone Patricia Trebilco, Maxwell Clifford Trebilco
Lot 14 DP 87069	NA44D/485	22 PALLISTER DRIVE	Hillsborough	Hong Kwong Chee, Leung Yim Chee
Lot 11 DP 87068	NA44D/480	16 PALLISTER DRIVE	Hillsborough	Jacqueline Kitty Patton, Michael Patton, Stephen Allan Patton
Lot 15 DP 87069	NA44D/486	24 PALLISTER DRIVE	Hillsborough	Garry Graham, Lee William Graham
Lot 20 DP 87069	NA44D/491	34 PALLISTER DRIVE	Hillsborough	John Bernard Porteous
Lot 16 DP 87069	NA44D/487	26 PALLISTER DRIVE	Hillsborough	Xiandong Meng, Xiaolin Wu
Lot 7 DP 38752	NA1007/297	196 HILLSBOROUGH ROAD	Lynfield-Three Kings	Cynthia Mary Miller, Douglas Beatson Miller
Lot 3 DP 38752	NA1060/165	194 HILLSBOROUGH ROAD	Lynfield-Three Kings	Mohammad Humayoon Safi
Lot 5 DP 38752	NA1010/274	200 HILLSBOROUGH ROAD	Lynfield-Three Kings	Presbyterian Church of New Zealand Property Trustees
Lot 14 DP 35249	NA113D/471, NA98C/99	217 HILLSBOROUGH ROAD	Lynfield-Three Kings	
Lot 13 DP 35249	NA903/110	215 HILLSBOROUGH ROAD	Lynfield-Three Kings	Nina Shen
Lot 12 DP 35249	NA92B/447, NA94D/810	213 HILLSBOROUGH ROAD	Lynfield-Three Kings	
Lot 6 DP 38752	NA1007/296	198 HILLSBOROUGH ROAD	Lynfield-Three Kings	Joseph Sungik Park, Kyung Ja Lee
Lot 2 DP 141688	NA84A/329	202 HILLSBOROUGH ROAD	Lynfield-Three Kings	The Presbyterian Church Property Trustees
Lot 2 DP 446514		192 HILLSBOROUGH ROAD	Lynfield-Three Kings	Wan-Ju Chang, Yang-Chung Lien
Lot 258 DP 66388	NA22B/1363	56 AMBURY ROAD	Mangere Bridge	Ross Murray McCabe, Tanya Natasha Coetser
Lot 257 DP 66388	NA22B/1362	58 AMBURY ROAD	Mangere Bridge	Anastasia Popo Tapusoa, Antonio Vainu'u Tapusoa
Lot 214 DP 62562	NA18C/1357	3 ANDES AVENUE	Mangere Bridge	Ian Ledger, Koti Ledger, Leilani Cherie Ledger
Lot 213 DP 62562	NA18C/1356	5 ANDES AVENUE	Mangere Bridge	Ngatamariki Lulia, Ramua Nio

<b>Legal Description</b>	<b>Title Reference</b>	<b>Address</b>	<b>Suburb</b>	<b>Owner<sup>2</sup></b>
Lot 175 DP 66387	NA22B/1323	12 CLARESHOLM PLACE	Mangere Bridge	Alan Walter Henry Morris, Valerie Joyce Morris
Lot 182 DP 66387	NA22B/1330	7 CLARESHOLM PLACE	Mangere Bridge	Dorothy Smith, Kevin Smith
Lot 179 DP 66387	NA22B/1327	13 CLARESHOLM PLACE	Mangere Bridge	Jane Louise Gravestock, Neil Gravestock
Lot 174 DP 66387	NA22B/1322	10 CLARESHOLM PLACE	Mangere Bridge	Delia Marie Douglas, Michael Joseph Douglas
Lot 183 DP 66387	NA22B/1331	5 CLARESHOLM PLACE	Mangere Bridge	Brent George Holtom, Edith Holtom
Lot 180 DP 66387	NA22B/1328	11 CLARESHOLM PLACE	Mangere Bridge	Colin Peter Moore, Rhonda Kathleen Faulkner
Lot 176 DP 66387	NA22B/1324	14 CLARESHOLM PLACE	Mangere Bridge	Brian Mark Stevens, David Gloster Daniel, Elizabeth Margaret Stevens
Lot 181 DP 66387	NA22B/1329	9 CLARESHOLM PLACE	Mangere Bridge	Steven Marshall Thomas, Suzanne May Thomas
Lot 184 DP 66387	NA22B/1332	3 CLARESHOLM PLACE	Mangere Bridge	Jill Adele Whitehead, Murray Charles Whitehead
Lot 177 DP 66387	NA22B/1325	16 CLARESHOLM PLACE	Mangere Bridge	Petina Jane Hadler, Warren Rex Hadler
Lot 178 DP 66387	NA45B/899, NA45B/900, NA45B/901	15 CLARESHOLM PLACE	Mangere Bridge	
Lot 266 DP 66388	NA22B/1371	8 FELTWEEL PLACE	Mangere Bridge	David Yhill Kwong Choy, Yaolong Cai
Lot 186 DP 62561	NA18C/1338	88 KIWI ESPLANADE	Mangere Bridge	Conal James Dempsey, Jacqueline Bridget Lunjevich
Lot 185 DP 62561	NA18C/1337	87 KIWI ESPLANADE	Mangere Bridge	Alofa Limited
Lot 1 DP 64880	NA26D/945	98 MUIR AVENUE	Mangere Bridge	Auckland Council
Lot 217 DP 62562	NA18C/1360	103 MUIR AVENUE	Mangere Bridge	Isaia Toeava
Lot 216 DP 62562	NA18C/1359	105 MUIR AVENUE	Mangere Bridge	Cherry Anne Kingham, Michael George Thomson, Ronald Steven Kingham
Lot 2 DP 64880	NA26D/946	96 MUIR AVENUE	Mangere Bridge	Auckland Council
Lot 218 DP 62562	NA18C/1361	101 MUIR AVENUE	Mangere Bridge	Malia Koleti Franklin, Phillip John Franklin
Lot 215 DP 62562	NA18C/1358	107 MUIR AVENUE	Mangere Bridge	Harvey Raymond Clough, Nola Thelma Clough
Lot 219 DP 62562	NA18C/1362	99 MUIR AVENUE	Mangere Bridge	Aroha Linda Knight, Moana Elizabeth Knight
Lot 255 DP 66388	NA22B/1360	3 WARDEN PLACE	Mangere Bridge	Peter James Thomas, Renata Elisabeth Thomas
Lot 254 DP 66388	NA22B/1359	5 WARDEN PLACE	Mangere Bridge	Grant Stephen Martin, Suzanne Margaret Martin
Lot 251 DP 66388	NA22B/1356	8 WARDEN PLACE	Mangere Bridge	Dulcie Robertson
Lot 253 DP 66388	NA22B/1358	7 WARDEN PLACE	Mangere Bridge	Judith Lynn Devaliant, Lionel James Devaliant
Lot 252 DP 66388	NA22B/1357	9 WARDEN PLACE	Mangere Bridge	Barry William Moffatt, Dawn Moffatt

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 256 DP 66388	NA22B/1361	1 WARDEN PLACE	Mangere Bridge	Peter James Thomas, Renata Elisabeth Thomas
Lot 3 DP 156421	NA94A/55	66 WELLESLEY ROAD	Mangere Bridge	Auckland Council
Lot 313 DP 66388	NA22B/1385	4 WITLA COURT	Mangere Bridge	Watercare Services Limited
Lot 11 DP 11225	NA665/79	16 ALBERTON AVENUE	Mount Albert	Andrew Norman Levien, Emma Jane Frances Rutherford
Lot 9 DP 11225	NA87D/91, NA87D/92	12 ALBERTON AVENUE	Mount Albert	
Lot 8 DP 11225	NA470/80	10 ALBERTON AVENUE	Mount Albert	Li Chen
Lot 7 DP 11225	NA470/79	8 ALBERTON AVENUE	Mount Albert	Victor Patrick Marie van Wetering
Lot 10 DP 11225	NA665/122	14 ALBERTON AVENUE	Mount Albert	Christine Margaret Sullivan, Gregory John Sullivan
Lot 1 DP 325643	103554	6A ALBERTON AVENUE	Mount Albert	Danyel Regan Simich, Paul George Ah Kuoi
Lot 2 DP 325643	103555	6 ALBERTON AVENUE	Mount Albert	Juan Guo, Ke Jun Zhang
Lot 6 DP 13644	NA53C/1415, NA53C/1416, NA53C/1417, NA53C/1418, NA53C/1419	84 ASQUITH AVENUE	Mount Albert	
Lot 3 DP 169555	NA103B/748	67 ASQUITH AVENUE	Mount Albert	Bruce Colloff, Linda Christine Cooke
Lot 7 DP 77486	NA14B/1192, NA14B/1193, NA14B/1194, NA14B/1195, NA14B/1196	86 ASQUITH AVENUE	Mount Albert	
Lot 2 DP 77486	NA49B/96, NA49B/97, NA49B/98, NA49B/99	63 ASQUITH AVENUE	Mount Albert	
Lot 1 DP 116055	NA101C/235, NA66A/230, NA72B/247	65 ASQUITH AVENUE	Mount Albert	
Lot 1 DP 77486	NA95A/111, NA95A/112, NA95A/113	61 ASQUITH AVENUE	Mount Albert	
Lot 3 DP 211251	NA139B/437	88A ASQUITH AVENUE	Mount Albert	Gary Wayne Walker
Lot 4 DP 211251	NA139B/438	88B ASQUITH AVENUE	Mount Albert	Jane Torrance, Nola Anne Abraham, Phillip Scott Mason
Lot 1 DP 415919	461903	67A ASQUITH AVENUE	Mount Albert	Anvi Bharat Kumar Ved, Sharokh Cyrus Bharucha
Lot 6 DP 415919	461908	67F ASQUITH AVENUE	Mount Albert	Feiyue Wang
Lot 7 DP 415919	461909	67G ASQUITH AVENUE	Mount Albert	Heather Jacqueline Barham, Mary Nina Barnes,



Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
				Stephen Middleton Barham
Lot 29 DP 19168	NA22D/380	10 BURNSIDE AVENUE	Mount Albert	Elaine Wendy Turner
Lot 27 DP 19168	NA1525/47	14 BURNSIDE AVENUE	Mount Albert	Deborah Susan Pyle, Neil John Hardie
Lot 25 DP 19168	NA441/295	18 BURNSIDE AVENUE	Mount Albert	Janette Ann Simpson, Lindsay Gordon Simpson, Mark Gilbert Simpson
Lot 6 DP 38126	NA43A/218	16 BURNSIDE AVENUE	Mount Albert	Housing New Zealand Limited
Lot 24 DP 19168	NA604/170	20 BURNSIDE AVENUE	Mount Albert	Jonathan Richard Barrett, Sarah Jane Haigh
Lot 28 DP 19168	NA723/127	12 BURNSIDE AVENUE	Mount Albert	Matthew John Airey, Stacey Anne Airey
Lot 32 DP 19751	NA491/103	35 CHATHAM AVENUE	Mount Albert	Gordon William Smith
Lot 34 DP 19751	NA482/44	31A-31B CHATHAM AVENUE	Mount Albert	Clint Jacob Hornell, Craig Malcolm Dotchin, Kimberley Anne Fraser
Lot 14 DP 16747	NA424/54	20 LINWOOD AVENUE	Mount Albert	Alicia Maree Kelsall, David John Kelsall
Lot 1 DP 116937	NA66C/195	24 LINWOOD AVENUE	Mount Albert	Alison Marie Alblas, Michael Bangs
Lot 23 DP 16747	NA395/184	13 LINWOOD AVENUE	Mount Albert	Outram Anders Olesen
	NA110B/678, NA110B/679, NA110B/680, NA110B/681, NA110B/682, NA110B/683, NA110B/6			
Lot 18 DP 16747	NA416/55	54 LINWOOD AVENUE	Mount Albert	
Lot 56 DP 20480	NA848/231	3 LINWOOD AVENUE	Mount Albert	Kathleen Mary Sinnott, Sean Patrick Sinnott
Allot 267 Sec 10 SBRS OF Auckland		52 LINWOOD AVENUE	Mount Albert	Huang Shih Ming
Lot 27 DP 16747	NA128C/376	46A LINWOOD AVENUE	Mount Albert	Auckland Council
Lot 26 DP 16747	NA8D/229	21 LINWOOD AVENUE	Mount Albert	Geoffrey Nolan Willis, Roseanna Gabrielle Grogan
Lot 25 DP 16747	NA395/21	19 LINWOOD AVENUE	Mount Albert	Kim Irene Buffalora, Peter Milan Buffalora
Lot 2 DP 15346	NA394/24 89881, NA40B/1221, NA40B/1223, NA95C/838	17 LINWOOD AVENUE	Mount Albert	Stuart Donald McLennan
Lot 215 DP 20480	NA71A/806, NA80C/323	2 LINWOOD AVENUE	Mount Albert	
Lot 24 DP 16747	NA385/235	23 LINWOOD AVENUE	Mount Albert	
Allot 276 Sec 10 SBRS OF	NA51B/622	15 LINWOOD AVENUE	Mount Albert	Mark Joseph Mathews
		28A LINWOOD AVENUE	Mount Albert	AIS Properties Limited

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Auckland				
Lot 19 DP 16747	NA417/274	5 LINWOOD AVENUE	Mount Albert	Angela Kate Brooker, Robert Stephen Brooker
Lot 15 DP 16747	NA452/120	22 LINWOOD AVENUE	Mount Albert	Diana Margaret McKergow, Soren Wislang
Lot 6 DP 16747	NA383/3	4 LINWOOD AVENUE	Mount Albert	Kathryn Anne Christina Manning
Lot 2 DP 116937	NA66C/196	26 LINWOOD AVENUE	Mount Albert	Mohammed Ali Meme
Lot 1 DP 32294	NA68C/105, NA72B/993	28 LINWOOD AVENUE	Mount Albert	
Lot 57 DP 20480	NA926/94	50 LINWOOD AVENUE	Mount Albert	Carol June Rogers, Graeme Ernest Rogers, Gregory Neil Rogers
Lot 22 DP 16747	NA54D/1211	11 LINWOOD AVENUE	Mount Albert	Kelly Dawn Cook, Pravir Atindra Tesiram, Sherridan Scott Cook
Lot 7 DP 16747	NA386/128	6 LINWOOD AVENUE	Mount Albert	June Winifred Maxwell, Ralph Thomas Maxwell
Allot 258 Sec 10 SBRS OF Auckland	NA110B/678, NA110B/679, NA110B/680, NA110B/681, NA110B/682, NA110B/683, NA110B/6	1/56 LINWOOD AVENUE	Mount Albert	
	NA422/167	8 LINWOOD AVENUE	Mount Albert	Gordon David Fook, Sylvia Sui Yin Fook
	NA416/54	1 LINWOOD AVENUE	Mount Albert	Deborah Marie Feyter, John Allan Feyter
	NA110C/239, NA110C/240, NA110C/241, NA110C/242, NA110C/243, NA110C/244, NA110C/2	1/17-59/17 LYON AVENUE	Mount Albert	
	NA73D/710	19 LYON AVENUE	Mount Albert	St Lukes Enterprises Limited
	NA725/48	55 MARTIN AVENUE	Mount Albert	Joanne Harris, Lawrence James McColl Catherine Judith Anne Goodwin, David Michael Ducker
Lot 1 DP 38126	578709	75 MARTIN AVENUE	Mount Albert	
Lot 3 DP 19168	NA721/228	53 MARTIN AVENUE	Mount Albert	Gregory Lawrence Oldham
Lot 5 DP 19168	NA475/202	57 MARTIN AVENUE	Mount Albert	Carolyn Margaret Cox, Nicholas Andrew Bain
Part Lot 32 DP 16371	NA1587/68 189159, 189161, 189162, 189163, 189165, 189166,	52 MARTIN AVENUE	Mount Albert	Ian Douglas Soole, Patricia Anne Soole
Lot 15 DP 7699		27 MORNING STAR PLACE	Mount Albert	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
	189169, 189170, 189171, 189172,			
	189159, 189161, 189162, 189163, 189165, 189166, 189169, 189170, 189171, 189172,	28 MORNING STAR PLACE	Mount Albert	
Lot 2 DP 206560				
Lot 50 DP 16371	NA415/286	8 NORRGROVE AVENUE	Mount Albert	Maurice James McGlynn, Rosemary Kieran McGlynn
Lot 48 DP 16371	NA451/214	12 NORRGROVE AVENUE	Mount Albert	David Andrew Simpson, Pruedence Marie Simpson
Lot 47 DP 16371	NA404/231	14 NORRGROVE AVENUE	Mount Albert	Percy Thomas Lackey
Lot 51 DP 16371	NA391/274	6 NORRGROVE AVENUE	Mount Albert	Anthony John Bates, Peter Louis Lennon
Lot 46 DP 16371	NA53A/1403, NA53A/1405, NA91B/738	16 NORRGROVE AVENUE	Mount Albert	
Lot 49 DP 16371	NA446/202	10 NORRGROVE AVENUE	Mount Albert	John James O'Connor, Karin Gunilla Morberg
Lot 20 DP 40419	NA1660/44	9 NORRIE AVENUE	Mount Albert	Shanna Mei Young Hay
Lot 6 DP 40419	NA26C/1081	12 NORRIE AVENUE	Mount Albert	Maja Batinica, Miomir Batinica
Lot 18 DP 40419	NA8B/970	13 NORRIE AVENUE	Mount Albert	Nicholas Eric Howell
Lot 22 DP 40419	NA33A/124	5 NORRIE AVENUE	Mount Albert	Vera Green
Lot 3 DP 40419	NA1334/68	6 NORRIE AVENUE	Mount Albert	Gina Cruz, Henry Hidalgo
	NA33C/418, NA33C/419, NA33C/420, NA33C/421, NA33C/422, NA33C/423, NA33C/424, NA3			
Lot 1 DP 75760		1 NORRIE AVENUE	Mount Albert	
Lot 5 DP 40419	NA1B/752	10 NORRIE AVENUE	Mount Albert	Emma Victoria Cooper, Robert Christopher Hilton Hoar
Lot 23 DP 40419	NA1358/79	3 NORRIE AVENUE	Mount Albert	Forever Limited
Lot 2 DP 40419	NA5D/1375	4 NORRIE AVENUE	Mount Albert	Barry Andrew McLaren
Lot 1 DP 40419	NA26C/173	2 NORRIE AVENUE	Mount Albert	Gui Ling Yan, Wei Ping Wang
Lot 10 DP 40419	NA3B/797	20 NORRIE AVENUE	Mount Albert	Housing New Zealand Limited
Lot 7 DP 40419	NA1870/79	14 NORRIE AVENUE	Mount Albert	Graham Peter Walker
Lot 8 DP 40419	NA1625/70	16 NORRIE AVENUE	Mount Albert	Amber Evenstar Noble, Anthony Bruce Noble, Claudia Tattersfield
Lot 19 DP 40419	NA2041/53	11 NORRIE AVENUE	Mount Albert	Kate Paterson, Warren James Paterson

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 21 DP 40419	NA30D/434, NA30D/435, NA30D/436	7 NORRIE AVENUE	Mount Albert	
Lot 9 DP 40419	NA19A/481	18 NORRIE AVENUE	Mount Albert	David James Griffin, Garry Dennis George Tucker
Lot 32 DP 41107	NA26B/398	9A RAWALPINDI STREET	Mount Albert	Auckland Council
Lot 5 DP 13644	NA45D/122, NA45D/123, NA45D/124, NA45D/125, NA45D/126, NA45D/127, NA45D/128, NA4	3 ROSSGROVE TERRACE	Mount Albert	
Lot 1 DP 13644	NA411/131	11 ROSSGROVE TERRACE	Mount Albert	Linda Ann Mayne, Robin John Nelson
Lot 8 DP 234	NA90/195	1 ROSSGROVE TERRACE	Mount Albert	Ian James Cole, Joy Burnett
Lot 5 DP 15346	NA363/257	15 ROSSGROVE TERRACE	Mount Albert	Keith William Boyd, Khalil Hassanali Vajji
Lot 1 DP 15346	NA369/269	19 ROSSGROVE TERRACE	Mount Albert	Brenda Maree Gantley, Craig Michael Hickey
Lot 1 DP 16371		21 ROSSGROVE TERRACE	Mount Albert	
Lot 4 DP 15346	NA105D/581	17 ROSSGROVE TERRACE	Mount Albert	Craig Robert Stachurski, Katherine Mary Stachurski
Lot 2 DP 15870	NA609/138	137 TAYLORS ROAD	Mount Albert	Jennifer Mary Oxley
Part Lot 3 DP 49276	NA101C/675, NA9D/1409, NA9D/1410	128B TAYLORS ROAD	Mount Albert	
Lot 1 DP 53895	NA13A/446	130 TAYLORS ROAD	Mount Albert	Allan James McEvoy, Bernadette Therese McEvoy, Kevin Gerrard O'Brien
Lot 5 DP 37517	NA972/275	129 TAYLORS ROAD	Mount Albert	Deidre Sharon Brown, Grant Douglas Bulley
Lot 1 DP 48340	NA1940/97	126 TAYLORS ROAD	Mount Albert	Kamla Dhana
Lot 2 DP 53895	NA6A/1346	130A TAYLORS ROAD	Mount Albert	Kathleen Mary Tassie, Shirley Cecelia Tassie
Lot 2 DP 48340	NA1891/100	128 TAYLORS ROAD	Mount Albert	Fearn Lee Limited
Lot 2 DP 77193	NA39A/926, NA39A/927, NA39A/928, NA39A/929	132A TAYLORS ROAD	Mount Albert	
Lot 3 DP 68359	NA33C/103, NA33C/104, NA33C/105, NA33C/107	132B TAYLORS ROAD	Mount Albert	
Lot 3 DP 26413	NA886/108	131 TAYLORS ROAD	Mount Albert	Andrew John Dexter Guest, David Justin Rhodes, Jane Lesley Rhodes
Lot 1 DP 15870	NA360/11	135 TAYLORS ROAD	Mount Albert	Deidre Sharon Brown, Grant Douglas Bulley
Lot 3 DP 15870	NA455/125	141 TAYLORS ROAD	Mount Albert	Margaret Alvie Walker, Rhys Gerard Walker
Lot 1 DP 68359	NA38A/462, NA38A/463, NA38A/464	134 TAYLORS ROAD	Mount Albert	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 1 DP 136644	NA80C/306, NA81B/918	139A TAYLORS ROAD	Mount Albert	
	NA25B/1453, NA25B/1454, NA25B/1455, NA25B/1456, NA25B/1457, NA25B/1458			
Lot 1 DP 49276		128A TAYLORS ROAD	Mount Albert	
Lot 3 DP 53895	NA13A/447	130B TAYLORS ROAD	Mount Albert	Brett Turnbull, Eric Robert Taylor
Lot 35 DP 16371	NA400/34	7 VERONA AVENUE	Mount Albert	Antony Paul Bock Rouse, Margaret Ruth Rouse
Lot 36 DP 16371	NA403/69	9 VERONA AVENUE	Mount Albert	Housing New Zealand Limited
Lot 40 DP 16371	NA43A/871	17 VERONA AVENUE	Mount Albert	Stephen John Rowe, Therese Bisson-Rowe
Lot 34 DP 16371	NA470/89	5 VERONA AVENUE	Mount Albert	Jingfu Yao, Qingshan Yang
Lot 43 DP 16371	NA411/60	23 VERONA AVENUE	Mount Albert	George Stuart Wingate
Lot 41 DP 16371	NA385/116	19 VERONA AVENUE	Mount Albert	Dennis Stephen Jupp, Graeme Charles Worthington, Macky Trustee Company Limited
Lot 38 DP 16371	NA400/138	13 VERONA AVENUE	Mount Albert	Joanne Shanley, Mark Richard Bowater
Lot 45 DP 16371	NA375/33	27 VERONA AVENUE	Mount Albert	Craig Andrew Park, Rhonda Shirlene Park, Zejjan Alexander Unkovich
Lot 39 DP 16371	NA386/251	15 VERONA AVENUE	Mount Albert	Michael Thomas Herrick, Sarah Kathleen Herrick, Wackrow Smith & Davies Trustee Services Limited
Lot 44 DP 16371	NA413/47	25 VERONA AVENUE	Mount Albert	Geoffrey Reginald Lomax, Kathleen Maree Gray
Lot 42 DP 16371	NA412/79	21 VERONA AVENUE	Mount Albert	Anna Kate Paterson, James Anthony Paterson
Lot 37 DP 16371	NA409/100	11 VERONA AVENUE	Mount Albert	Matthew Francis Geisler, Victoria Lee Geisler
Part Lot 33 DP 16371	NA1506/79	3 VERONA AVENUE	Mount Albert	Gellert Ivanson Trustee Limited, Shirley Anne Ryan, William Joseph Andrew Ryan
Lot 1 DP 196598	NA125C/606	1/1-12/1 WAGENER PLACE	Mount Albert	Petavid Investments Limited
	NA135C/700, NA135C/701, NA135C/702, NA135C/703, NA135C/704, NA135C/705, NA135C/7			
Lot 6 DP 49096	405644, 405645, 405646, 405647, 405648, 405649, 405650, 405651, 405652,	1/3-65/3 WAGENER PLACE	Mount Albert	
Lot 12 DP 49751		101/4-426/4 WAGENER PLACE	Mount Albert	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
	405653,			
Lot 5 DP 49096	NA2074/51	2 WAGENER PLACE	Mount Albert	Chit Wing Or, Irving Teoh, Zhi Wen He
Lot 14 DP 7029	NA1999/21	7 WAIRERE AVENUE	Mount Albert	Auckland Council
Lot 11 DP 7029	NA61B/925, NA61B/926	13 WAIRERE AVENUE	Mount Albert	
Lot 13 DP 7029	NA134C/52, NA134C/53, NA134C/54, NA134C/55	9 WAIRERE AVENUE	Mount Albert	
Lot 10 DP 7029	NA108D/294	15 WAIRERE AVENUE	Mount Albert	Anne Marie Boyd, Robin Dennis Boyd
Lot 9 DP 7029	NA229/223	17 WAIRERE AVENUE	Mount Albert	Eric William Mellor, Inness Grace Hazel Mellor
Lot 8 DP 7029	NA202/133	19 WAIRERE AVENUE	Mount Albert	Derek Grant Phillips, Hamish Richard Archer
Lot 12 DP 7029	NA87D/307, NA89D/437	11 WAIRERE AVENUE	Mount Albert	
Lot 7 DP 7029	NA189/92	21 WAIRERE AVENUE	Mount Albert	Paul James Kilgour, Paulette Barnes-Kilgour, Trustee Services Limited
Lot 4 DP 37123	NA961/26	415A RICHARDSON ROAD	Mount Albert- Hillsborough	Sylvia Carvalho
Lot 1 DP 128348	NA74D/602, NA77A/212	432 RICHARDSON ROAD	Mount Albert- Hillsborough	
Lot 3 DP 37123	NA961/23	413 RICHARDSON ROAD	Mount Albert- Hillsborough	Menon Property Investments Limited
Part Lot 1 DEEDS Whau 1	NA1073/80	430 RICHARDSON ROAD	Mount Albert- Hillsborough	Rudy Satrio Gunawan
Lot 1 DP 50931	NA83A/657, NA83A/658	436 RICHARDSON ROAD	Mount Albert- Hillsborough	
Lot 2 DP 37123	NA961/42	411 RICHARDSON ROAD	Mount Albert- Hillsborough	Joyce Marie Griffiths
Lot 1 DP 364559	262231	434 RICHARDSON ROAD	Mount Albert- Hillsborough	Kanchan Sunilkumar Chandhani, Sunilkumar Anandram Chandhani
Lot 2 DP 364559	262232	434A RICHARDSON ROAD	Mount Albert- Hillsborough	Chandar Sen Bali, Maya Wati Bali
Lot 11 DP 17748	NA459/144	187 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Ivo Tolich, Linda Maree Tolich, Timothy John Goulding
Lot 14 DP 10465	NA415/67	176 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Geoffrey Grant Mack
Lot 14 DP 19915	NA89D/633, NA89D/634	193 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	
Lot 10 DP 17748	NA111A/606, NA115C/959	185 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	

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Lot 13 DP 10465	NA415/66	174 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Michael Charles LeRoy-Dyson
Lot 16 DP 19915	NA449/1	197 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	A F P Limited
Lot 10 DP 10465	NA9B/1229, NA9B/1230, NA9B/1231, NA9B/1232	164 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	
Lot 12 DP 19915	NA94D/589, NA94D/590	189 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	
Lot 9 DP 10465	NA315/308	162 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Eighteen Eighteen Limited
Lot 70 DP 19915	NA57D/211, NA57D/212, NA57D/213	199 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	
Lot 1 DP 155403	NA92D/433	118-120 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Institute of Environmental Science and Research Limited
Lot 13 DP 19915	NA110C/209, NA113D/20	191A MOUNT ALBERT ROAD	Mount Albert-Royal Oak	
Lot 12 DP 10465	NA680/85	172 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Usha Kumari Singh, Vijay Prakash Singh
Lot 15 DP 19915	NA453/290	195 MOUNT ALBERT ROAD	Mount Albert-Royal Oak	Gary Brian Miller, Glennis Beverley Miller
Lot 238 DP 17584	NA1110/27	45 ARUNDEL STREET	Mount Roskill	Mary Brown Neil Paul
Lot 240 DP 17584	NA796/224	41 ARUNDEL STREET	Mount Roskill	Deo Devi Nirmala
Lot 242 DP 17584	NA980/82	37 ARUNDEL STREET	Mount Roskill	Union Coatings Limited
Lot 2 DP 61122	NA25D/1422, NA25D/1423	2 ARUNDEL STREET	Mount Roskill	
Lot 254 DP 17584	NA73C/755, NA77B/304	11 ARUNDEL STREET	Mount Roskill	
Lot 249 DP 17584	381029, 381030	23 ARUNDEL STREET	Mount Roskill	
Lot 2 DP 144097	NA94B/955, NA94B/956, NA94B/957, NA94B/958, NA94B/959, NA94B/960	15 ARUNDEL STREET	Mount Roskill	
Lot 239 DP 17584	NA796/223	43 ARUNDEL STREET	Mount Roskill	Kenneth George Rooney
Lot 247 DP 17584	NA104C/216, NA88B/651	27 ARUNDEL STREET	Mount Roskill	
Lot 241 DP 17584	NA114A/864, NA114A/865	39A ARUNDEL STREET	Mount Roskill	
Lot 246 DP 17584	NA489/112	29 ARUNDEL STREET	Mount Roskill	Peter Warwick Hitchcock, Susan Elizabeth Hodson, Trent Nigel Hodson
Lot 253 DP 17584	NA118B/507	13 ARUNDEL STREET	Mount Roskill	Robert Nolan Walden



Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 251 DP 17584	NA1008/190	19 ARUNDEL STREET	Mount Roskill	Angelina Anita Reddy, Vijay Krishna Reddy
Lot 264 DP 17584	NA1066/272	17 ARUNDEL STREET	Mount Roskill	Lin Shen, Ping Li
Lot 1 DP 61122	NA16C/1180	4 ARUNDEL STREET	Mount Roskill	Ker Win Ng, Michiyo Mori
Lot 1 DP 376937	309307	31 ARUNDEL STREET	Mount Roskill	Huifeng Zhu, Qiaoling Huang
Lot 2 DP 376937	309308	31A ARUNDEL STREET	Mount Roskill	Farida Suterwala, Mohammedi Zoeb Suterwala, Sakina Zoeb Suterwala
Lot 1 DP 390946	423836	35 ARUNDEL STREET	Mount Roskill	Daleson Trustee Limited
Lot 2 DP 390946	423837	35A ARUNDEL STREET	Mount Roskill	Daleson Trustee Limited
Lot 1 DP 408543	431055	33 ARUNDEL STREET	Mount Roskill	Rongjian Chen, Yu Chang Chen
Lot 2 DP 408543	431056	33A ARUNDEL STREET	Mount Roskill	Rongjian Chen, Yu Chang Chen
Lot 1 DP 414400	454851	21 ARUNDEL STREET	Mount Roskill	PNR Holdings Limited
Lot 2 DP 414400	454852	21A ARUNDEL STREET	Mount Roskill	Nisha Pahuja, Rakesh Dharampal Pahuja
Lot 6 DP 37868	NA46C/653	6 AURORA AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 7 DP 37868	NA46C/654	8 AURORA AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 8 DP 37868	NA19A/177	10 AURORA AVENUE	Mount Roskill	Ranjini Naidu, Suresh Naidu
Lot 78 DP 37868	NA49C/1123	17 AURORA AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 3 DP 200529	NA129C/124	15 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 2 DP 200507	NA129C/41	16 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 366 DP 48547	NA107B/547	8 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 201563	NA130B/72	13 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 3 DP 200507	NA129C/42	18 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 200507	NA129C/40	14 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 368 DP 48547	NA107B/548	12 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 2 DP 200529	NA129C/123	17 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 151808	NA111D/543, NA111D/544, NA111D/545	7A-9 BALFRON AVENUE	Mount Roskill	
Lot 2 DP 201563	NA130B/73	11 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 200529	NA129C/122	19 BALFRON AVENUE	Mount Roskill	Housing New Zealand Limited

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 1 DP 21 1024	NA139A/830	10 BALFRON AVENUE	Mount Roskill	Jikuan Li, Xiaolei Wang
Lot 2 DP 21 1024	NA139A/831	10A BALFRON AVENUE	Mount Roskill	li XIONG
Lot 68 DP 48241	NA1875/68	16 BATTERSBY AVENUE	Mount Roskill	Louise Mary Allen, Michael Rowland Allen
Lot 62 DP 48241	NA1875/62	28 BATTERSBY AVENUE	Mount Roskill	Jennifer Anne Hough, Mark Ernest Hough
Lot 64 DP 48241	NA1875/64	24 BATTERSBY AVENUE	Mount Roskill	Kwek Faen Fam, Yew Kong Chan
Lot 43 DP 51798	NA1D/1154	3 BATTERSBY AVENUE	Mount Roskill	Paul Praneeth Puranam
Lot 57 DP 48241	NA1875/57	38 BATTERSBY AVENUE	Mount Roskill	Andrew Peter David Ferguson, Dianne Joyce Verrall
Lot 59 DP 48241	NA1875/59	34 BATTERSBY AVENUE	Mount Roskill	Judith Lilian Paddon, William Ronald Herbert Paddon
Lot 71 DP 48241	NA86A/631, NA91C/28	10 BATTERSBY AVENUE	Mount Roskill	
Lot 69 DP 48241	NA1875/69	14 BATTERSBY AVENUE	Mount Roskill	Beverley Joan Hinchcliffe, Leslie Vincent Hinchcliffe
Lot 74 DP 49937	NA1976/30	4 BATTERSBY AVENUE	Mount Roskill	Ji Yun Chen, Ying Lin Li
Lot 66 DP 48241	NA1875/66	20 BATTERSBY AVENUE	Mount Roskill	Subhodini Thanababu, Thiyagalingam Thanababu
Lot 73 DP 49937	NA1976/29	6 BATTERSBY AVENUE	Mount Roskill	Shailaja Bobba, Sreerama Reddy Bobba
Lot 65 DP 48241	NA1875/65	22 BATTERSBY AVENUE	Mount Roskill	Cheng Zhang, Yushen Huang
Lot 72 DP 49937	NA1976/28	8 BATTERSBY AVENUE	Mount Roskill	Auckland Council
Lot 61 DP 48241	NA42A/110	30 BATTERSBY AVENUE	Mount Roskill	Andrea Rachelle Browne, Ryan Patrick Butler
Lot 67 DP 48241	NA1875/67	18 BATTERSBY AVENUE	Mount Roskill	Wi Investment Limited
Lot 63 DP 48241	NA1875/63	26 BATTERSBY AVENUE	Mount Roskill	Antoinette Marie Carvalho, Ivan Godfrey Carvalho
Lot 44 DP 51798	NA50B/884	5 BATTERSBY AVENUE	Mount Roskill	Sophie Tihoi Moko King
Lot 58 DP 48241	NA1875/58	36 BATTERSBY AVENUE	Mount Roskill	Ada Song House Limited
Lot 46 DP 51798	NA129A/179	9 BATTERSBY AVENUE	Mount Roskill	VBR Shah Limited
Lot 60 DP 48241	NA1875/60	32 BATTERSBY AVENUE	Mount Roskill	Hong Gu Kim, Kyung Rye Yoon
Lot 70 DP 48241	529464, NA85D/878	12 BATTERSBY AVENUE	Mount Roskill	
Lot 45 DP 51798	NA52B/884	7 BATTERSBY AVENUE	Mount Roskill	Kwek Faen Fam, Yew Kong Chan
Lot 42 DP 48241	NA1875/42	1 BATTERSBY AVENUE	Mount Roskill	Ketan Undevia, Sandhya Ketanbhai Undevia
Lot 85 DP 20551	NA85C/401, NA89B/19	4 BEAGLE AVENUE	Mount Roskill	
Lot 2 DP 37868	NA46C/651	12 BEAGLE AVENUE	Mount Roskill	Housing New Zealand Limited

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 84 DP 20551	NA98A/521, NA98A/522	2 BEAGLE AVENUE	Mount Roskill	
Lot 82 DP 20551	NA498/52	3 BEAGLE AVENUE	Mount Roskill	Jan Arthur Krajcer
Lot 81 DP 20551	NA109B/233, NA111D/595	1 BEAGLE AVENUE	Mount Roskill	
Lot 1A DP 47915	NA46C/656	8 BEAGLE AVENUE	Mount Roskill	Jon Matthew Arthur Richardson
Lot 1B DP 47915	NA31A/878	10 BEAGLE AVENUE	Mount Roskill	Donna Marguerite Richardson, Laura Mary Lovrich
Lot 86 DP 20551	NA1397/84	6 BEAGLE AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 15 DP 51619	NA1D/1302	5 CAMELLIA PLACE	Mount Roskill	Chen Che, Ningfei Zhu
Lot 16 DP 51619	NA7C/1055	3 CAMELLIA PLACE	Mount Roskill	The Win Trust Company Limited
Lot 80 DP 46203	NA1630/51	4 ELLIS AVENUE	Mount Roskill	Clarence Cecil Kohlhase
Lot 81 DP 46203	NA95C/559, NA96B/181, NA97D/703	2 ELLIS AVENUE	Mount Roskill	
Lot 79 DP 46203	NA1630/52	6 ELLIS AVENUE	Mount Roskill	Mina Mohini
Lot 1 DP 46203	NA6A/287	1 ELLIS AVENUE	Mount Roskill	Reginald Sashikant Prasad
Lot 163 DP 40515	NA108C/522, NA108C/523	5A FREELAND AVENUE	Mount Roskill	
Lot 75 DP 40515	NA99C/638	12 FREELAND AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 166 DP 40515	NA9D/882	11 FREELAND AVENUE	Mount Roskill	Steven John Ravlich
Lot 119 DP 42694	NA47C/631	61 FREELAND AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 190 DP 42694	NA71D/42	80 FREELAND AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 164 DP 40515	NA121A/855, NA121A/856	7A FREELAND AVENUE	Mount Roskill	
Lot 76 DP 40515	NA18D/1128	10 FREELAND AVENUE	Mount Roskill	Davorka Vinka Ravlich, Steve Ivan Ravlich
Lot 162 DP 40515	NA116A/787, NA122A/419	3 FREELAND AVENUE	Mount Roskill	
Lot 120 DP 42694	NA47C/632	63 FREELAND AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 165 DP 40515	NA2A/652	9 FREELAND AVENUE	Mount Roskill	JSM Investment Limited
Lot 74 DP 40515	NA20C/907	14 FREELAND AVENUE	Mount Roskill	Alexander Young, Mary Wei Wah Young
Lot 191 DP 42694	NA82C/991	82 FREELAND AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 189 DP 42694	NA68B/925, NA68D/841	78 FREELAND AVENUE	Mount Roskill	
Lot 1 DP 379897	320183	65A FREELAND AVENUE	Mount Roskill	Xiaoxi Cao, You Wen Cao

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 2 DP 379897	320184	65 FREELAND AVENUE	Mount Roskill	Bi Juan Wu, Wei Ming Chen
Lot 29 DP 49583	NA1989/65	18 GREGORY PLACE	Mount Roskill	George Albert Whitehead, Maureen Amelia Whitehead
Lot 27 DP 49583	NA2098/6	22 GREGORY PLACE	Mount Roskill	Rohan Leitch Taylor, Yvonne Lesley Taylor
Lot 30 DP 49583	NA1B/964	16 GREGORY PLACE	Mount Roskill	James Manikath, Tessy James
Lot 28 DP 49583	NA129A/172	20 GREGORY PLACE	Mount Roskill	Auckland Council
Lot 26 DP 49583	NA2101/20	19 GREGORY PLACE	Mount Roskill	Cecil Ram Lochan, Chathapuram Ramanathan Vardarajan, Saraswati Devi Lochan
Lot 36 DP 49583	NA3A/815	4 GREGORY PLACE	Mount Roskill	Claudia Charlotte Schoenauer
Lot 33 DP 49583	NA2026/7	10 GREGORY PLACE	Mount Roskill	Alamelu Badrinayanan, Srinivasaraghavan Badrinayanan
Lot 32 DP 49583	NA2057/47	12 GREGORY PLACE	Mount Roskill	Remington Liu
Lot 35 DP 49583	NA2063/88	6 GREGORY PLACE	Mount Roskill	Dhiru Ramji, Jasu Ramji
Lot 34 DP 49583	NA119D/912	8 GREGORY PLACE	Mount Roskill	Qingsong Li, Shurong Zhang
Lot 31 DP 49583	NA5D/560	14 GREGORY PLACE	Mount Roskill	Barry Donald Allan Wilson
Lot 78 DP 49937	NA1976/32	8 HAYCOCK AVENUE	Mount Roskill	Auckland Council
Lot 79 DP 48241	NA1875/79	4 HAYCOCK AVENUE	Mount Roskill	Violet Elizabeth Laughland
Lot 76 DP 48241	NA1875/76	10 HAYCOCK AVENUE	Mount Roskill	Qiyun Li, Quan Li
Lot 80 DP 48241	NA1875/80	2 HAYCOCK AVENUE	Mount Roskill	Josy Joy Arockiasamy, Mary Merlin Shoba Lourdusamy
Lot 1 DP 48241	NA1875/1	1 HAYCOCK AVENUE	Mount Roskill	Chuen Shing Mok, Wai Man Wong
Lot 40 DP 48241	NA1875/40	16 HAYCOCK AVENUE	Mount Roskill	Megan Joy Pooley, Wayne Pooley
Lot 41 DP 48241	NA89C/387	14 HAYCOCK AVENUE	Mount Roskill	Heather Irene Gyde, Wayne Allan Gyde
Lot 77 DP 48241	NA1875/77	6 HAYCOCK AVENUE	Mount Roskill	M & K NZ Investment Company Limited
Lot 63 DP 155755	NA96A/173, NA99A/526	4A JANA PLACE	Mount Roskill	
Lot 64 DP 155755	NA93A/253	7 JANA PLACE	Mount Roskill	Kenneth John Anderson, Maureen Carol Anderson
Lot 62 DP 155755	NA95B/600, NA95B/601	2 JANA PLACE	Mount Roskill	
Lot 7 DP 194667	NA123D/918	28 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 350 DP 42694	NA107B/544	6 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 194667	NA123D/912	26 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 5 DP 194667	NA123D/916	26D KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 364 DP 44674	NA52A/862, NA52A/863	6A KALLU CRESCENT	Mount Roskill	
Lot 2 DP 194667	NA123D/913	26A KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 157 DP 42694	NA99C/338	8 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 141 DP 42694	NA55B/348	15 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 4 DP 194667	NA123D/915	26C KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 6 DP 194667	NA123D/917	30 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 152 DP 42694	NA45A/136	18 KALLU CRESCENT	Mount Roskill	Gingia Moera Daniels, Kare Daniels
Lot 149 DP 42694	NA107B/540	24 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 3 DP 194667	NA123D/914	26B KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 156 DP 42694	NA107B/542	10 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 140 DP 42694	NA112A/255	13 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 137 DP 53729	NA70A/858	7 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 151 DP 42694	NA99C/337	20 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 354 DP 42694	NA112A/257	5 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 138 DP 53729	NA48C/479	9 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 150 DP 42694	NA115D/314	22 KALLU CRESCENT	Mount Roskill	John Murray Sweetman, Ronald Macmillan Craig, Susan Ethne Sweetman
Lot 155 DP 42694	NA64A/857	12 KALLU CRESCENT	Mount Roskill	Waish Builders Trust Limited
Lot 139 DP 42694	NA67C/506	11 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 153 DP 42694	NA107B/541	16 KALLU CRESCENT	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 207892	NA136B/585	14A KALLU CRESCENT	Mount Roskill	Haitao Li
Lot 2 DP 207892	NA136B/586	14 KALLU CRESCENT	Mount Roskill	Arthur Barry Magee, Heather Magee
Lot 20 DP 43542	NA1309/51	36 MARION AVENUE	Mount Roskill	Pauline Elizabeth Forster
Lot 10 DP 43542	NA88A/573, NA88A/574	51 MARION AVENUE	Mount Roskill	
Lot 9 DP 43542	NA76B/472, NA80C/959	49 MARION AVENUE	Mount Roskill	
Lot 22 DP 43542	NA2087/60	40 MARION AVENUE	Mount Roskill	Lenda Maree Edwards, Mark William Walker
Lot 8 DP 43542	NA1977/7	47 MARION AVENUE	Mount Roskill	Emili Vaitohi, Iunise Vaitohi

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 11 DP 43542	NA127C/808, NA127C/809	53 MARION AVENUE	Mount Roskill	
Lot 21 DP 43542	NA1353/10	38 MARION AVENUE	Mount Roskill	Dalip Prasad, Kusum Prasad Dennis Wallabh, Fastco Trustees Limited, Mita Wallabh
Lot 19 DP 43542	NA1347/50	34 MARION AVENUE	Mount Roskill	
Lot 1 DP 395414	381128	42B MARION AVENUE	Mount Roskill	Beatrice Melroy Lobo, Melroy Marian Lobo
Lot 2 DP 395414	381129	42A MARION AVENUE	Mount Roskill	Clive Brenton Fernandes, Vanessa Clive Fernandes
Lot 4 DP 426987	506135	44D MARION AVENUE	Mount Roskill	Chandar SEN, Rajnish Lata SEN
Part Lot 15 DP 289	396088	39 MARSHALL LAING AVENUE	Mount Roskill	Her Majesty the Queen
Lot 5 DP 197411	NA126C/995	136 MAY ROAD	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 31348	NA803/159	140 MAY ROAD	Mount Roskill	Housing New Zealand Limited
Lot 3 DP 197411	NA126C/993	132 MAY ROAD	Mount Roskill	Housing New Zealand Limited
Lot 2 DP 197411	NA126C/992	130 MAY ROAD	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 41825	NA88B/745, NA88B/746, NA88B/747, NA88B/748	111 MAY ROAD	Mount Roskill	
Lot 4 DP 197411	NA126C/994	134 MAY ROAD	Mount Roskill	Housing New Zealand Limited
Lot 3 DP 40979	NA1087/200	119 MAY ROAD	Mount Roskill	May Road Properties Limited
Lot 6 DP 197411	NA126C/996	138 MAY ROAD	Mount Roskill	Housing New Zealand Limited
Part Lot 136 DP 42461	NA1381/38	13 MAY ROAD	Mount Roskill	Auckland Council
Lot 65 DP 155755	NA93A/254	13 NIRVANA WAY	Mount Roskill	Auckland Council
Lot 1 DP 36851	NA1332/89	34 OAKDALE ROAD	Mount Roskill	Rajesh Kalra, Sangeeta Kalra
Lot 2 DP 60904	NA17B/1125	44 OAKDALE ROAD	Mount Roskill	Pi-Yu Huang, Tsu-Chieh Yu
Lot 2 DP 65516	NA26A/457, NA26A/458 NA83A/654, NA83D/691, NA83D/692	60A OAKDALE ROAD	Mount Roskill	
Lot 3 DP 60904	NA15D/1246	42 OAKDALE ROAD	Mount Roskill	
Part Lot 2 DP 36851	NA1943/77	36 OAKDALE ROAD	Mount Roskill	Yu Kueng Cheung
Lot 4 DP 47337		32 OAKDALE ROAD	Mount Roskill	Xiang Jun Li, Xiao Gang Wang
Lot 1 DP 60904	NA15D/899 NA100B/901, NA106A/366, NA99D/297	46 OAKDALE ROAD	Mount Roskill	Dorothy Joyce Mitchell, Jocelyn Mary Eaddy, Wayne Frederick Mitchell
Lot 3 DP 47337		30 OAKDALE ROAD	Mount Roskill	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 40 DP 17583	NA80C/721, NA92B/958	31 OAKDALE ROAD	Mount Roskill	
Lot 43 DP 17584	NA62A/1197, NA62A/1198	25 OAKDALE ROAD	Mount Roskill	
Lot 7 DP 60904	NA15D/902	40 OAKDALE ROAD	Mount Roskill	Sadhna Kant, Yashni Kant
Lot 6 DP 60904	NA15D/900	38 OAKDALE ROAD	Mount Roskill	Alex James Metzger, Leanne Metzger
Lot 3 DP 56464	NA79B/476, NA79B/477, NA80D/904, NA80D/905	60 OAKDALE ROAD	Mount Roskill	
Lot 38 DP 17583	NA620/28	35A OAKDALE ROAD	Mount Roskill	Cheing Tan, Suat Im Lee
Part Lot 4 DP 36851	NA103A/575, NA99B/545, NA99B/546	1/48-3/48 OAKDALE ROAD	Mount Roskill	
Lot 1 DP 114434		27 OAKDALE ROAD	Mount Roskill	
Lot 1 DP 377320	310587	29 OAKDALE ROAD	Mount Roskill	Kyle Graeme Martin, Michelle Lyn Chaproniere
Lot 2 DP 377320	310588	29A OAKDALE ROAD	Mount Roskill	Jennifer Katherine Askelund
Lot 1 DP 437451	538516	33 OAKDALE ROAD	Mount Roskill	Ketan Undevia, Sandhya Ketanbhai Undevia
Lot 2 DP 437451	538517	33A OAKDALE ROAD	Mount Roskill	Sunil Nivritti Bhole, Sumita Sunil Bhole
Lot 86 DP 46727	NA45A/443	11 O'DONNELL AVENUE	Mount Roskill	Afroza Begum Ali
Lot 87 DP 38569	NA45A/437	9 O'DONNELL AVENUE	Mount Roskill	David Philip Billing
Lot 88 DP 38569	NA45A/438	5 O'DONNELL AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 89 DP 38525	NA1034/99	3 O'DONNELL AVENUE	Mount Roskill	The First Fijian Assembly of God Trust Board
Part Lot 142 DP 17584	NA45C/458, NA45C/459, NA45C/460	2 ROGAN STREET	Mount Roskill	
Lot 1 DP 116924	NA66C/173	58 ROMA ROAD	Mount Roskill	Foodstuffs (Auckland) Limited
Part Lot 8 DP 52447		60 ROMA ROAD	Mount Roskill	
Lot 71 DP 37869	NA51D/196	22 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 75 DP 37868	NA51D/194	32 SHEPPARD AVENUE	Mount Roskill	Chuanzhong Qiu, Jin Luan
Lot 4 DP 125610	NA73B/336	2/29 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 69 DP 37869	NA54C/1315, NA56B/572	18 SHEPPARD AVENUE	Mount Roskill	
Lot 76 DP 37868	NA48C/1392	34 SHEPPARD AVENUE	Mount Roskill	Lisi Siave, Tanielu Siave
Lot 73 DP 37869	NA51D/197	26 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 74 DP 37869	NA51D/198	30 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 2 DP 197506	NA126D/158	27 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 77 DP 37868	NA51D/195	36 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 72 DP 37869	NA1868/95	24 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 68 DP 46727	NA71D/789	14 SHEPPARD AVENUE	Mount Roskill	Keith Edward Duggan, Wendy Denise Duggan
Lot 70 DP 37869	NA3A/915	20 SHEPPARD AVENUE	Mount Roskill	Ruiqi Lin
Lot 1 DP 197213	NA126C/168	31 SHEPPARD AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 1 DP 41064	NA62D/878, NA75A/329	1A STAVELEY AVENUE	Mount Roskill	
Lot 2 DP 41064	NA1098/92	3 STAVELEY AVENUE	Mount Roskill	AI Ding Hii, Kuang You Ching
Lot 3 DP 61122	NA16C/1182	4 STAVELEY AVENUE	Mount Roskill	Phillip Gray Ellis
Lot 46 DP 17584	NA92D/882, NA92D/883	8 STAVELEY AVENUE	Mount Roskill	
Lot 47 DP 17584	NA431/255	10 STAVELEY AVENUE	Mount Roskill	Dorothy Margaret Sutton
Lot 5 DP 34847	NA35C/84	58 STODDARD ROAD	Mount Roskill	Daniel Browne Limited
Lot 4 DP 42275	NA43B/1060	50 STODDARD ROAD	Mount Roskill	Bodytec (NZ) Limited
Lot 168 DP 39104	NA1096/253, NA1131/47	119 STODDARD ROAD	Mount Roskill	
Lot 167 DP 39104	NA1096/253, NA1863/57	117 STODDARD ROAD	Mount Roskill	
Lot 139 DP 39104	NA1096/253, NA35B/566	67/45-77/45 STODDARD ROAD	Mount Roskill	
Lot 6 DP 34847	NA35C/84	56 STODDARD ROAD	Mount Roskill	Daniel Browne Limited
Lot 8 DP 34847	NA923/88	52 STODDARD ROAD	Mount Roskill	Bodytec (NZ) Limited
Lot 7 DP 34847	NA934/232	54 STODDARD ROAD	Mount Roskill	ZF International Limited
Lot 3 DP 42275	NA100C/442, NA95A/552, NA95A/553, NA95A/554, NA95A/555, NA95A/556, NA95A/558	1/34C-6/34C STODDARD ROAD	Mount Roskill	
Lot 1 DP 200499	NA129B/110	8 SUBRITZKY AVENUE	Mount Roskill	Priya Jain, Vishal Jain
Lot 24 DP 48338	NA74D/806, NA74D/807, NA74D/808	26 SUBRITZKY AVENUE	Mount Roskill	
Lot 23 DP 48338	NA4B/1058	24 SUBRITZKY AVENUE	Mount Roskill	Andrew Basford Green, Graham David Marmont, Jennifer Mary Marmont
Lot 12 DP 47144	NA100B/729, NA84B/588	6 SUBRITZKY AVENUE	Mount Roskill	
Lot 16 DP 48338	NA1950/34	14 SUBRITZKY AVENUE	Mount Roskill	S and D Property Rentals Limited



Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 18 DP 48338	NA111C/498, NA111C/499	18A SUBRITZKY AVENUE	Mount Roskill	
Lot 11 DP 47144	NA134A/946, NA87C/221	4 SUBRITZKY AVENUE	Mount Roskill	
Lot 25 DP 48338	NA1957/40	28 SUBRITZKY AVENUE	Mount Roskill	Miaohong Chen
Lot 2 DP 200499	NA129B/111	8A SUBRITZKY AVENUE	Mount Roskill	Aguinaldo Trustees Limited
Lot 15 DP 47144	NA79A/373, NA84A/544	12 SUBRITZKY AVENUE	Mount Roskill	
Lot 19 DP 48338	NA1991/15	20 SUBRITZKY AVENUE	Mount Roskill	Paul Lo, Simone Lo
Lot 17 DP 48338	NA73A/931, NA99D/214	16 SUBRITZKY AVENUE	Mount Roskill	
Part Lot 20 DP 48338	NA73D/257, NA79A/333	22 SUBRITZKY AVENUE	Mount Roskill	
Lot 1 DP 322411	89430	10 SUBRITZKY AVENUE	Mount Roskill	Arunthathy Muralaetharan, Muralaetharan Krishnar
Lot 2 DP 322411	89431	10A SUBRITZKY AVENUE	Mount Roskill	Abhay Chandrakant Kolhe, Maneesha Abhay Kolhe
Lot 1 DP 362424	254725	30 SUBRITZKY AVENUE	Mount Roskill	Priya Kumarasamy, Santheesh Elangovan
Lot 2 DP 362424	254726	30A SUBRITZKY AVENUE	Mount Roskill	Arvind Kumar Lal, Naina Lal
Lot 10 DP 37868	NA46C/655	4 THOMSON STREET	Mount Roskill	Housing New Zealand Limited
Lot 12A DP 47915	NA46C/657	8 THOMSON STREET	Mount Roskill	Piwakawaka Investments Limited
Lot 11 DP 37868	NA22B/420	6 THOMSON STREET	Mount Roskill	Julian Christopher Dyne
Lot 9 DP 37868	NA57A/1262, NA65C/290	2 THOMSON STREET	Mount Roskill	
Lot 17 DP 37869	NA57C/86, NA60A/65	1 THOMSON STREET	Mount Roskill	
Lot 80 DP 20551	NA1518/18	20 TYBURNIA AVENUE	Mount Roskill	Rui Pan
Lot 83 DP 20551	NA22C/1	22 TYBURNIA AVENUE	Mount Roskill	Housing New Zealand Limited
Lot 79 DP 20551	NA601/186	18 TYBURNIA AVENUE	Mount Roskill	Kathleen Veronica Kotara
Lot 165 DP 39104	NA1096/253, NA55A/731	4 WILLIAM BLOFIELD AVENUE	Mount Roskill	
Lot 164 DP 39104	NA1096/253, NA55A/730	6 WILLIAM BLOFIELD AVENUE	Mount Roskill	
Lot 151 DP 39104	NA1096/253, NA52B/1474	9 WILLIAM BLOFIELD AVENUE	Mount Roskill	
Lot 154 DP 39104	NA1096/253, NA52B/1477	3 WILLIAM BLOFIELD AVENUE	Mount Roskill	
Lot 150 DP 39104	NA1096/253, NA52B/1473	11 WILLIAM BLOFIELD AVENUE	Mount Roskill	
Lot 153 DP 39104	NA1096/253, NA52B/1476	5 WILLIAM BLOFIELD AVENUE	Mount Roskill	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 166 DP 39104	NA1096/253, NA55A/732	2 WILLIAM BLOFIELD AVENUE	Mount Roskill	
Lot 1 DP 356197	229244	1 WILLIAM BLOFIELD AVENUE	Mount Roskill	Yasmin Sidiyot, Zuber Sidiyot
Lot 2 DP 356197	229245	1A WILLIAM BLOFIELD AVENUE	Mount Roskill	Acharya Srinivas Kidambi
Lot 1 DP 401545	404368	7A WILLIAM BLOFIELD AVENUE	Mount Roskill	Imran Sadiq, Shehzad Sadiq, Subha Chaudhry
Lot 2 DP 401545	404369	7 WILLIAM BLOFIELD AVENUE	Mount Roskill	Imran Sadiq, Shehzad Sadiq, Subha Chaudhry
Lot 7 DP 38633	NA21D/1160	1424 DOMINION ROAD	Mount Roskill-Eden Terrace	Pirioi Tamarua
Lot 53 DP 38218	NA111B/160	1169 DOMINION ROAD	Mount Roskill-Eden Terrace	New Zealand Fire Service Commission
Lot 6 DP 38633	NA56A/781	1422 DOMINION ROAD	Mount Roskill-Eden Terrace	N.S. Management Services Limited
Lot 55 DP 38218	NA97B/520	1173 DOMINION ROAD	Mount Roskill-Eden Terrace	Housing New Zealand Limited
Lot 54 DP 38218	NA111B/161	1171 DOMINION ROAD	Mount Roskill-Eden Terrace	New Zealand Fire Service Commission
Lot 1 DP 366472	269351	1420A DOMINION ROAD	Mount Roskill-Eden Terrace	Housing New Zealand Limited
Lot 6 DP 366472	269356	1420K DOMINION ROAD	Mount Roskill-Eden Terrace	Housing New Zealand Limited
Lot 7 DP 366472	269357	1420J DOMINION ROAD	Mount Roskill-Eden Terrace	Housing New Zealand Limited
Lot 1 DP 421661	482864	1167 DOMINION ROAD	Mount Roskill-Eden Terrace	Serena Li
Lot 2 DP 421661	482865	1167A DOMINION ROAD	Mount Roskill-Eden Terrace	Lakshmi Padma Kumar, Padma Kumar Krishnan Nair
Lot 39 DP 56466	NA8C/1284	61 MARY DREAVAR STREET	New Windsor	Kamla Kishor Patel, Kishor Fakir Patel
Part Lot 15 DP 56466	NA125C/175, NA125C/176	92A MARY DREAVAR STREET	New Windsor	
Lot 10 DP 56466	NA8C/1255	82 MARY DREAVAR STREET	New Windsor	Zeus Equities Limited
Lot 5 DP 56466	NA8C/1250	72 MARY DREAVAR STREET	New Windsor	Ning Tang
Lot 13 DP 56466	NA8C/1258	88 MARY DREAVAR STREET	New Windsor	Leiny De Veyra Pena, Romeo Maranan Pena
Lot 8 DP 56466	NA8C/1253	78 MARY DREAVAR STREET	New Windsor	Amardeep Kaur Rekhi, Dasmeet Singh Rekhi
Lot 16 DP 56466	NA8C/1261	94 MARY DREAVAR STREET	New Windsor	John Kay Ritchie, Margaret Ritchie
Lot 2 DP 56466	NA8C/1247	66 MARY DREAVAR STREET	New Windsor	Jean Mohally

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 4 DP 56466	NA8C/1249	70 MARY DREAVAR STREET	New Windsor	Jane Angela Mather
Lot 37 DP 56466	NA8C/1282	65 MARY DREAVAR STREET	New Windsor	Jason Walter Hanna, Sharon Loretta Hanna Shobhna Vallabh Patel, Titirangi Trustees Limited, Vallabh Magan Patel
Lot 17 DP 56466	NA8C/1262	96 MARY DREAVAR STREET	New Windsor	RNK Sen Group Limited
Lot 18 DP 56466	NA8C/1263	98 MARY DREAVAR STREET	New Windsor	Dong Bin He
Lot 9 DP 56466	NA8C/1254	80 MARY DREAVAR STREET	New Windsor	Fengxi Zhang
Lot 7 DP 56466	NA119D/324	76 MARY DREAVAR STREET	New Windsor	Kevin Frethey, Somjai Kaewjangwat
Lot 38 DP 56466	NA8C/1283	63 MARY DREAVAR STREET	New Windsor	
Lot 1 DP 77506	NA111D/419, NA111D/420	60 MARY DREAVAR STREET	New Windsor	
Lot 11 DP 56466	NA101B/89, NA103D/88, NA103D/89, NA103D/90	84 MARY DREAVAR STREET	New Windsor	
Lot 2 DP 55993	NA11A/4	62 MARY DREAVAR STREET	New Windsor	Mark Andrew Lewis, Natasha Bernice Jones
Lot 3 DP 56466	NA8C/1248	68 MARY DREAVAR STREET	New Windsor	Ruhollah Dost
Lot 14 DP 56466	NA8C/1259	90 MARY DREAVAR STREET	New Windsor	Kaarem Ayman Al-Darra, Kathryn Florence Wilson
Lot 6 DP 56466	NA8C/1251	74 MARY DREAVAR STREET	New Windsor	Dongbin He, Yanli Wang
Lot 1 DP 211868	NA139D/378	86 MARY DREAVAR STREET	New Windsor	Judith Prudence Simon, Kevin Ashley Simon Gayathri Prabhakar Pillai, Prabhakar Pillai Somasekharan
Lot 1 DP 208237	NA136C/535	56 MARY DREAVAR STREET	New Windsor	Idris Mohammed Ibrahim, Maureen Nisha Ibrahim, Tawa Trustees Limited
Lot 2 DP 208237	NA136C/536	58 MARY DREAVAR STREET	New Windsor	Kashmiraben Gautamchandra Parmar, Yagnesh Narshinbai Patel
Lot 1 DP 377588	311479	54 MARY DREAVAR STREET	New Windsor	Chandra Raniga, Dhiraj Ben Raniga
Lot 3 DP 377588	311481	54A MARY DREAVAR STREET	New Windsor	Chandra Raniga, Dhiraj Ben Raniga
Lot 4 DP 377588	311482	52A MARY DREAVAR STREET	New Windsor	James Lovett Gardner Anand Kumar Singh, Jayana Jamnadas, Mahesh Kumar Jamnadas
Lot 1 DP 185331	NA115C/847	84 MULGAN STREET	New Windsor	Jay Kam Investment Limited
Lot 2 DP 185331	NA115C/848	84A MULGAN STREET	New Windsor	Shangxiao Li
Lot 3 DP 43516	NA1635/56	124 WHITNEY STREET	New Windsor- Blockhouse Bay	Umang Enterprises Limited
Lot 1 DP 86640	NA44B/468	115 WHITNEY STREET	New Windsor- Blockhouse Bay	
Lot 6 DP 43516	NA4C/671	130 WHITNEY STREET	New Windsor- Blockhouse Bay	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 1 DP 43516	NA1629/74	120 WHITNEY STREET	New Windsor-Blockhouse Bay	Wei Chen, Xuetao Tang
Lot 1 DP 48733	NA63A/8, NA63A/9	136 WHITNEY STREET	New Windsor-Blockhouse Bay	
Lot 5 DP 43516	NA4C/671	128 WHITNEY STREET	New Windsor-Blockhouse Bay	Umang Enterprises Limited
Lot 4 DP 43516	NA108B/629, NA99A/328	126 WHITNEY STREET	New Windsor-Blockhouse Bay	
Lot 4 DP 324818	99995, 99996 469128, NA68D/826, NA68D/827	122 WHITNEY STREET	New Windsor-Blockhouse Bay	
Lot 95 DP 10465		8 CAMDEN ROAD	Sandringham	
Lot 29 DP 10465	NA53A/312, NA71C/271	35 EUSTON ROAD	Sandringham	
Lot 119 DP 10465	NA1029/266	33 EUSTON ROAD	Sandringham	Hui Ching Wu
Lot 11 DP 10465	NA45D/943, NA45D/944	48-50 EUSTON ROAD	Sandringham	
Lot 18 DP 18996	NA46C/234	29 FERGUSSON AVENUE	Sandringham	Andrew Joseph Murphy
Lot 19 DP 18996	NA468/227	31 FERGUSSON AVENUE	Sandringham	AKL Trustee No 2 Limited, Lawrence Colin Proffitt, Nicola Jane Proffitt
Lot 22 DP 18996	NA675/187	32 FERGUSSON AVENUE	Sandringham	Diane Susan Rice, Vianney Louise Newman-Watt
Lot 24 DP 18996	NA99C/795	28 FERGUSSON AVENUE	Sandringham	Helen Coral Robertson
Part Lot 38 DP 18996	NA41A/1102, NA41A/1103, NA41A/1104	30 FERGUSSON AVENUE	Sandringham	
Lot 17 DP 18996	NA467/59	27 FERGUSSON AVENUE	Sandringham	Jie Kuan Chen, Rong Lin
Lot 23 DP 18996	NA1895/2	30A FERGUSSON AVENUE	Sandringham	Linda Rose Lucich
Part Lot 38 DP 18996	NA1895/2			Linda Rose Lucich
Part Lot 37 DP 18996	NA1895/1	27A FERGUSSON AVENUE	Sandringham	James Robert Pullen, Vivienne Zhou Pullen
Lot 113 DP 10465	NA454/136	4 HAMPSTEAD ROAD	Sandringham	Marjorie Anne Jennings, Stephen John Pearson
Lot 108 DP 10465	NA449/63	7 HAMPSTEAD ROAD	Sandringham	Jhamrong Turner, Saseedaran Nair
Lot 111 DP 10465	NA134C/733, NA134C/734	8 HAMPSTEAD ROAD	Sandringham	
Lot 109 DP 10465	NA52C/101, NA52C/102, NA52C/103, NA52C/104	9 HAMPSTEAD ROAD	Sandringham	
Lot 110 DP 10465	NA52C/1361, NA52C/1362,	10 HAMPSTEAD ROAD	Sandringham	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
	NA52C/1363, NA52C/1365, NA52C/1366, NA52C/1367, NA52C/13			
Lot 1 DP 359042	240574	6A HAMPSTEAD ROAD	Sandringham	Alister Faber Fookes, Tony Faber Fookes
Lot 2 DP 359042	240575	6 HAMPSTEAD ROAD	Sandringham	Joy Zhao, Liu Jun
Lot 24 DP 45495	NA49C/851	96 HAVERSTOCK ROAD	Sandringham	Housing New Zealand Limited
Lot 39 DP 45282	NA1835/35	103 HAVERSTOCK ROAD	Sandringham	Eden Property Ventures Limited
Lot 55 DP 45282	NA92C/674, NA94A/143	135 HAVERSTOCK ROAD	Sandringham	
Lot 40 DP 45282	NA33A/905	105 HAVERSTOCK ROAD	Sandringham	Diane Margaret Parr, Geoffrey Harold Parr
Lot 31 DP 45282	NA48A/6	101 HAVERSTOCK ROAD	Sandringham	Ho Cheng Wong, Keng Peng Sio
Lot 15 DP 45495	NA49C/850	98 HAVERSTOCK ROAD	Sandringham	Housing New Zealand Limited
Lot 56 DP 45282	NA55A/1088	36 HAZELMERE ROAD	Sandringham	Hoon-Teng Teoh, Yoke-Yin Tan
Lot 9 DP 19877	NA868/252	34 HAZELMERE ROAD	Sandringham	James Thomas Varney, Kathleen Joy Lobb, Neil Rodney Lobb
Lot 2 DP 32762	NA865/262	3 KERR STREET	Sandringham	Jennifer Sigrid Freeman, Justin Minto
Lot 1 DP 32762	NA902/207	1 KERR STREET	Sandringham	Alison Frances Sherwin, Trevor Sherwin
Lot 1 DP 140781	NA86A/125, NA98D/550	6 KERR STREET	Sandringham	
Lot 3 DP 32762	NA865/263	5 KERR STREET	Sandringham	Sarah Louise Murphy
Lot 1 DP 67628	NA133A/447, NA133A/448, NA133A/449, NA133A/450, NA133A/451, NA133A/452, NA133A/4	1/23 LOCARNO AVENUE	Sandringham	
Lot 6 DP 49751	NA133A/338, NA133A/339, NA133A/340, NA133A/341, NA133A/342, NA133A/343, NA133A/3	1/28 LOCARNO AVENUE	Sandringham	
Lot 36 DP 45282	NA1613/35	6 PICKETT AVENUE	Sandringham	David Wheatley Blanchard, Karen Elizabeth Blanchard, SDM Trustee Company (2012) Limited
Lot 38 DP 45282	NA28A/20	8 PICKETT AVENUE	Sandringham	Pamela Ann Rushton

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 37 DP 45282	NA54A/390	7 PICKETT AVENUE	Sandringham	Pamela Ann Rushton
Lot 32 DP 45282	NA90C/390, NA90C/391	2 PICKETT AVENUE	Sandringham	
Lot 35 DP 45282	NA1989/28	5 PICKETT AVENUE	Sandringham	David Wheatley Blanchard, Karen Elizabeth Blanchard, SDM Trustee Company (2012) Limited
Lot 34 DP 45282	NA33A/1281	4 PICKETT AVENUE	Sandringham	Julie Margaret Crawford, Philip Grant Crawford, SDM Trustee Company (2004) Limited
Lot 1 DP 46871	NA51D/614	748 SANDRINGHAM ROAD EXTENSION	Sandringham	Auckland Council
Part Lot 6 DP 42283		746 SANDRINGHAM ROAD EXTENSION	Sandringham	
Lot 245 DP 40910	NA16B/1368	752 SANDRINGHAM ROAD EXTENSION	Sandringham	Anthony Bruce Bringans, Julie Lynette Woodcock
Lot 96 DP 38569	NA31D/257	765 SANDRINGHAM ROAD EXTENSION	Sandringham	Housing New Zealand Limited
Lot 243 DP 40910	NA81A/810	756 SANDRINGHAM ROAD EXTENSION	Sandringham	Francis Holland Ofa, Sesika Fifita Ofa
Lot 2 DP 46871	NA16A/14	750 SANDRINGHAM ROAD EXTENSION	Sandringham	The 59 Connection Limited
Lot 244 DP 40910	NA121D/964, NA121D/965	754 SANDRINGHAM ROAD EXTENSION	Sandringham	
Lot 90 DP 38525	NA1355/76	763 SANDRINGHAM ROAD EXTENSION	Sandringham	Housing New Zealand Limited
Lot 121 DP 10465	NA50A/774, NA50A/775, NA50A/776, NA50A/777, NA50A/778	75 TAUMATA ROAD	Sandringham	
Lot 122 DP 10465	NA104D/655, NA121A/310	77A TAUMATA ROAD	Sandringham	
Lot 26 DP 10465	NA62A/745, NA75A/987	78 TAUMATA ROAD	Sandringham	
Lot 30 DP 10465	NA988/29	70 TAUMATA ROAD	Sandringham	William Neville Craig
Lot 123 DP 10465	NA81A/659, NA81A/660	79 TAUMATA ROAD	Sandringham	
Lot 124 DP 10465	NA444/246	81 TAUMATA ROAD	Sandringham	Amanda Anne Watt, Robert Karl Kelly
Lot 28 DP 10465	NA609/145	74 TAUMATA ROAD	Sandringham	Lynette Mary Gibbard, Richard Noel Burchell
Lot 27 DP 10465	NA1085/48	76 TAUMATA ROAD	Sandringham	Housing New Zealand Limited
Lot 1 DP 329177	119127	83A TAUMATA ROAD	Sandringham	Bryce Ross Scown, Sandra Grace Scown
Lot 103 DP 388105	352629, 352630, 352631, 352632, 352633, 352634,	107 TAUMATA ROAD	Sandringham	

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
	352635, 352636, 352637, 352638,			
Lot 1 DP 425662 Allot 57 Sec 9 SBRS OF Auckland	501641	73 TAUMATA ROAD	Sandringham	David Anthony Lyon, Gerard Michael Molloy, Gregory Terence Darnell
Lot 3 DP 168863	NA43B/991	136 MOTIONS ROAD	Western Springs	Auckland Council
Lot 1 DP 68172	NA102C/994	99 MOTIONS ROAD	Western Springs	Regional Facilities Auckland Limited
Lot 4 DP 63861	NA31C/1407			Housing New Zealand Limited
Part Allot 175 Sec 10 SBRS OF Auckland	NA26C/1248			Auckland Council
Lot 3 DP 68172	NA532/265			Auckland Council
Lot 5 DP 68172	NA31C/1407			Housing New Zealand Limited
	NA31C/1407			Housing New Zealand Limited
	NA131D/936, NA131D/937, NA131D/938, NA131D/939, NA131D/940			
Lot 82 DP 48241				
Lot 3 DP 195580	NA123B/941			Auckland Council
Lot 1 DP 57249	NA125C/175, NA125C/176			
Lot 3 DP 63861	NA26C/1247			Auckland Council
Lot 5 DP 46203	NA2110/12			Alan Stuart Woods, Murray Lawrence Schnauer, Penelope Margaret Woods
Lot 2 DP 68172	NA31C/1407			Housing New Zealand Limited
Lot 75 DP 49937	NA1976/31			Auckland Council
Lot 2 DP 46203	NA6A/287			Reginald Sashikant Prasad
Lot 6 DP 46203	NA2110/12			Alan Stuart Woods, Murray Lawrence Schnauer, Penelope Margaret Woods
Lot 3 DP 46203	NA6A/287			Reginald Sashikant Prasad
Part Tidal Lands of Manukau Harbour Survey Office Plan 67474				

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Lot 1 DP 58697	NA14D/603			May Road Properties Limited
Part Lot 15 DP 7029	NA1999/21, NA2026/99 NA123D/912, NA123D/913, NA123D/914, NA123D/915, NA123D/916, NA123D/918			
Lot 8 DP 194667				
Lot 6 DP 63861	NA26B/1186			Auckland Council
Lot 6 DP 66388	NA22B/1344			Auckland Council
Lot 2 DP 156421	NA94A/54			Watercare Services Limited
Lot 110 DP 37868	NA1397/84			Housing New Zealand Limited
Lot 1 DP 77585	NA33D/1223			Auckland Council
Allot 275 Sec 10 SBRS OF Auckland	NA51B/622			AIS Properties Limited Alan Stuart Woods, Murray Lawrence Schnauer, Penelope Margaret Woods
Lot 4 DP 46203	NA2110/12			Auckland Council
Lot 3 DP 77585	NA33D/1225			Auckland Council
Lot 342 DP 49266	557280			Auckland Council
Lot 2 DP 204715	NA133C/336			Auckland Council
Lot 3 DP 204715	NA133C/336			Auckland Council
Lot 112 DP 43048				
Lot 115 DP 185476	NA114C/995 NA129B/922, NA129B/923, NA129B/924, NA129B/925, NA129B/926, NA129B/927, NA129B/9			Auckland Council
Allot 263 PSH OF Titirangi				
Lot 5 DP 169555	461903, 461904, 461905, 461906, 461907, 461908, 461909, NA103B/748			



Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Part Allot 38 PSH OF Titirangi	NA217/108			Auckland Council
Part Allot 38 PSH OF Titirangi	NA988/61			Auckland Council
Part Allot 38 PSH OF Titirangi				
Part Allot 36 PSH OF Titirangi				
Part Allot 41 PSH OF Titirangi				
Lot 142 DP 39105	NA1096/253			Her Majesty The Queen
	NA115B/119, NA115B/120, NA115B/121, NA115B/122, NA115B/123, NA115B/124, NA115B/1			
Lot 5 DP 179090				
Part Allot 168 Sec 10 SBRS OF Auckland				
Part Allot 169 Sec 10 SBRS OF Auckland				
	NA25B/1453, NA25B/1454, NA25B/1455, NA25B/1456, NA25B/1457, NA25B/1458			
Lot 2 DP 49276				The Christian and Missionary Alliance of New Zealand
Lot 2 DP 66166	NA22A/785			
Lot 4 DP 68172	NA31C/1407			Housing New Zealand Limited
Part Allot 39 PSH OF Titirangi				
Allot 297 Sec 10 SBRS OF Auckland	NA55B/880			Auckland Council
Lot 2 DP 77585	NA33D/1224			Auckland Council
Part Allot 171 Sec 10 SBRS OF Auckland	NA217/108			Auckland Council
Part Allot 171 Sec 10 SBRS OF Auckland	NA988/61			Auckland Council

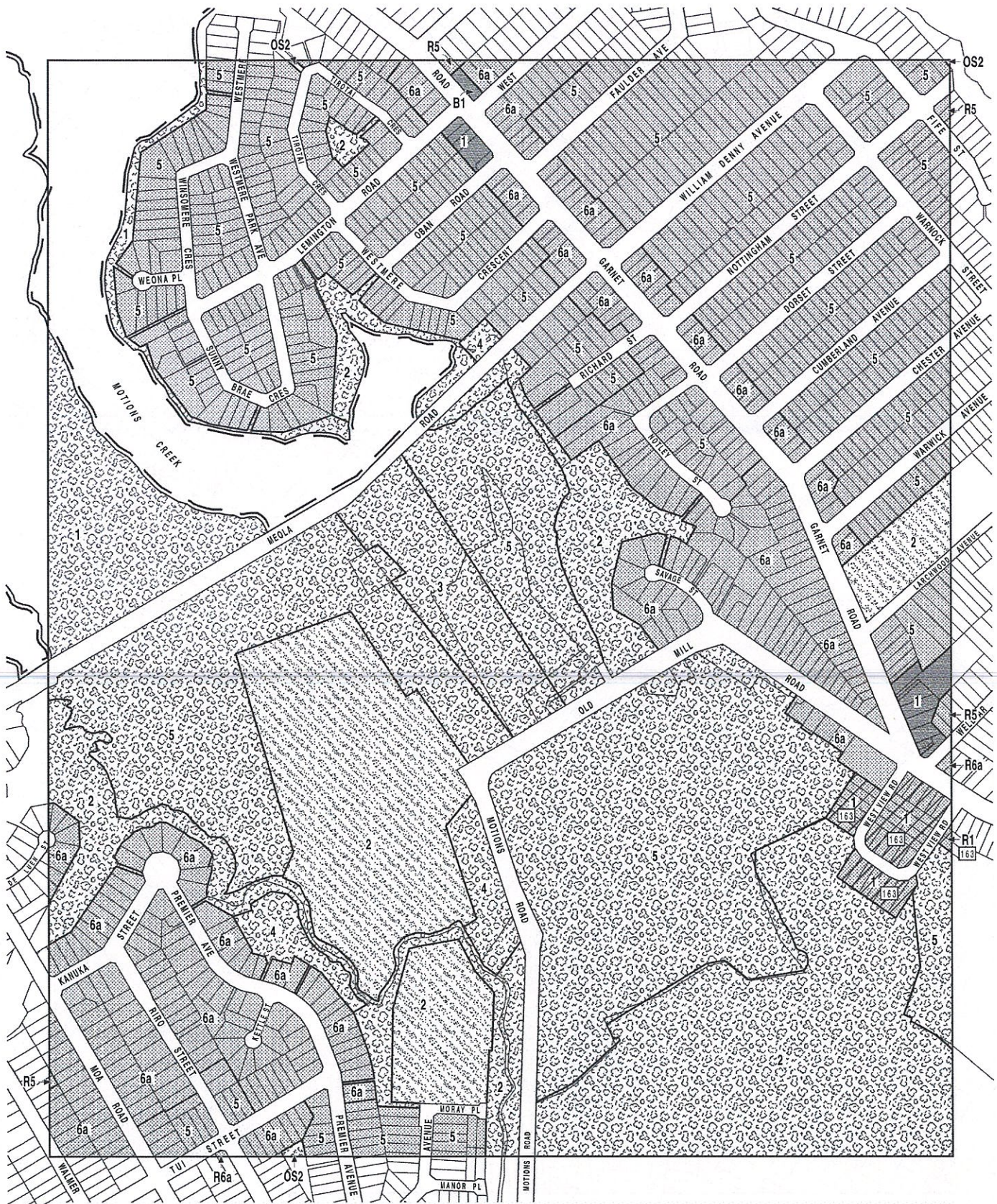
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Lot 2 DP 116924	NA66C/174			May Road Properties Limited
Lot 5 DP 63861	NA26B/1186			Auckland Council
Section 1 SO 42711	NA128C/376			Auckland Council
Part Lot 63 DP 19403	NA9B/916			Auckland Council
Part Allot 174 Sec 10 SBRS OF Auckland	NA532/265			Auckland Council
Lot 2 DP 141985	NA84B/48, NA93A/253, NA95B/600, NA95B/601, NA96A/173, NA99A/526			
Lot 6 DP 211251	NA139B/437, NA139B/438, NA139B/439			
Lot 8 DP 315571	61193, 61194, 61195, 61196			
Part Lot 1 DP 53828	NA5A/1266			Auckland Council
Lot 5 DP 329997	122687, 122688, 122689, 122690			
Lot 5 DP 345580	186760, 186761, 186762			
Lot 11 DP 366472	269351, 269352, 269353, 269354, 269355, 269356, 269357, 269358, 269359, 269360			
Lot 5 DP 369440	281999, 282000, 282001, 282002, 517355			
Lot 3 DP 401545	404368, 404369			
Lot 8 DP 415919	461903, 461904, 461905, 461906, 461907, 461908, 461909			
Part Allot 77 Sec 13 SBRS OF Auckland	NA8D/230			Auckland Council
Part Deposited Plan 22851	582114			The Akarana Golf Club (Incorporated)
Section 6 SO 421305	543930			Her Majesty the Queen
Section 57 SO 421305	543933			Her Majesty the Queen
Part Lot 7 DP 36008				
Part Lot 8 DP 42275	NA1190/39			Her Majesty the Queen

Legal Description	Title Reference	Address	Suburb	Owner <sup>2</sup>
Part Lot 32 DP 16371	NA1506/79			Gellert Ivanson Trustee Limited, Shirley Anne Ryan, William Joseph Andrew Ryan
Part Lot 33 DP 16371	NA1587/68			Ian Douglas Soole, Patricia Anne Soole
Lot 55 DP 51798	NA1D/1152			Auckland Council
Part Lot 142 DP 17584	NA97C/706, NA97D/304			
Lot 1 DP 451490	576051			The New Zealand Institute For Plant and Food Research Limited
Section 13 SO 434649	554928			Her Majesty the Queen
Section 22 SO 434649	554929			Her Majesty the Queen
Section 23 SO 434649	554928			Her Majesty the Queen
Lot 341 DP 40515	NA1508/90			Auckland Council
Part Lot 37 DP 18996				
Section 10 SO 421305				
Section 11 SO 421305				
Section 10 SO 434649				
Section 55 SO 421305	543931			Her Majesty the Queen
Lot 7 DP 315571	61197			Auckland Council

## Appendix D – Planning Maps







**C05**

B04	B05	B06
C04	C06	
D04	D05	D06

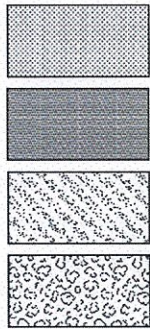
**PLANNING MAP No 1  
ZONING**



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**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**



Residential Activity Zones

Business Activity Zones

Special Purpose Activity Zones

Open Space Activity Zones



Boundary between zones



Special Parking Zones



Footways



Service Lanes



Motorways, Roads



Central Area Boundary



District Boundary

UPDATED 19/01/10













	Residential Activity Zones		Boundary between zones
	Business Activity Zones		Special Parking Zones
	Special Purpose Activity Zones		Footways
	Open Space Activity Zones		Service Lanes
			Motorways, Roads
			Central Area Boundary
			District Boundary

UPDATED 27/02/07

B05	B06	B07
C05	C07	<b>C06</b>
D05	D06	D07

**PLANNING MAP No 1  
ZONING**



0 1:7000 200m

CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999



H. AVENUE

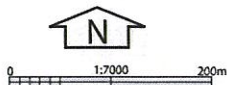




**C06**

B05	B06	B07
C05	C07	
D05	D06	D07

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**



**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

<ul style="list-style-type: none"> <li>Reference Numbers</li> <li>Designated Works</li> <li>Additional Development Controls</li> <li>Former Landfill Areas</li> <li>Sites subject to both Retail Frontage and Verandah Controls</li> <li>Sites subject to Verandah Control only</li> <li>Special Yard Requirement</li> <li>Buildings, Objects or Places</li> <li>Trees (singular)</li> <li>Groups of trees (two or more)</li> </ul>	<ul style="list-style-type: none"> <li>Archaeological and Geological Features</li> <li>Archaeological Feature only</li> <li>Geological Feature only</li> <li>Maori Heritage Sites</li> <li>Significant Ecological Areas</li> <li>Cliffline Tree Amenity Area</li> <li>Tamaki Drive Scenic Way</li> <li>Protection of Sunlight Admission Control to Broadway</li> <li>Building Line Restrictions</li> <li>Vehicular Access Restrictions</li> <li>Central Area Boundary</li> </ul>	<ul style="list-style-type: none"> <li>Interchange Control Areas</li> <li>Pedestrian Malls</li> <li>Footways</li> <li>Service Lanes</li> <li>Local Roads</li> <li>Collector Roads</li> <li>District Arterial Roads</li> <li>Regional Arterial Roads</li> <li>Strategic Routes</li> <li>All public roads are subject to designation B08-04</li> <li>District Boundary</li> </ul>
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UPDATED 17/04/12





		<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
		<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
		<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
		<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
		<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
				<b>District Boundary</b>

B05 B06 B07  
C05 C07  
D05 D06 D07

**C06**

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**



AVENUE









# D05

C04 C05 C06  
 D04 D06  
 E04 E05 E06

## PLANNING MAP No 2 ADDITIONAL LIMITATIONS



0 1:7000 200m



CITY OF AUCKLAND  
 DISTRICT PLAN  
 ISTHMUS SECTION  
 - OPERATIVE 1999

	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular) Groups of trees (two or more)		Building Line Restrictions		Strategic Routes
			Vehicular Access Restrictions		District Boundary
			Central Area Boundary		

All public roads are subject to designation B08-04

UPDATED 17/01/12

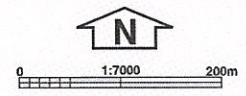





		<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
		<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
		<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
		<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
		<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
				<b>District Boundary</b>

C04	C05	C06	<b>D05</b>
D04	D06		
E04	E05	E06	

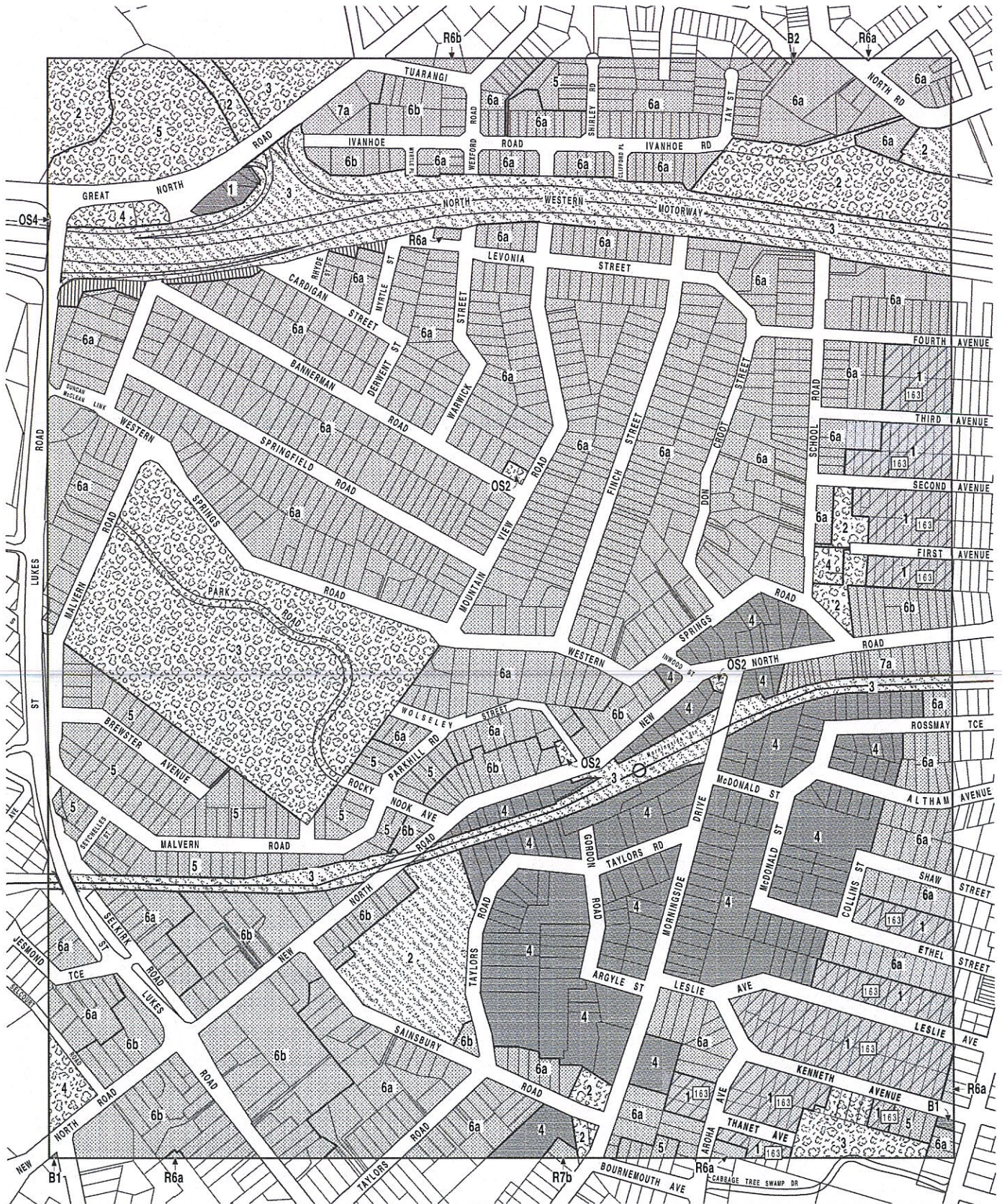
**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**







**D06**

C05 C06 C07  
D05 D07  
E05 E06 E07







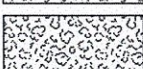




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ZONING**



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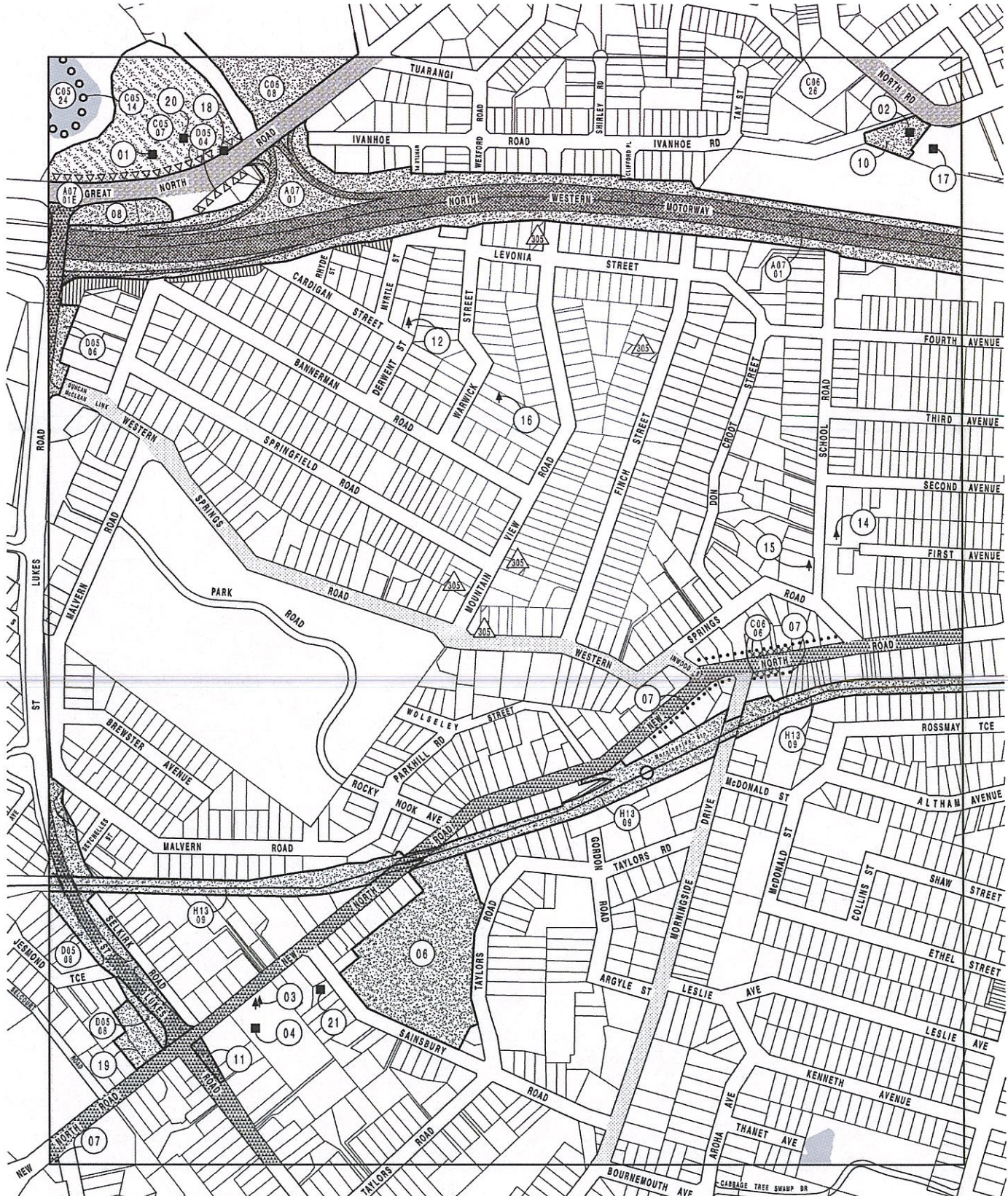


**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

	<b>Residential Activity Zones</b>		<b>Boundary between zones</b>
	<b>Business Activity Zones</b>		<b>Special Parking Zones</b>
	<b>Special Purpose Activity Zones</b>		<b>Footways</b>
	<b>Open Space Activity Zones</b>		<b>Service Lanes</b>
			<b>Motorways, Roads</b>
			<b>Central Area Boundary</b>
			<b>District Boundary</b>

UPDATED 27/02/07



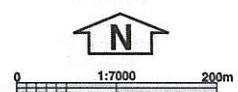


	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular)		Building Line Restrictions		Strategic Routes
	Groups of trees (two or more)		Vehicular Access Restrictions		All public roads are subject to designation B08-04
			Central Area Boundary		District Boundary

UPDATED 18/01/12

C05 C06 C07  
D05 D07 **D06**  
E05 E06 E07

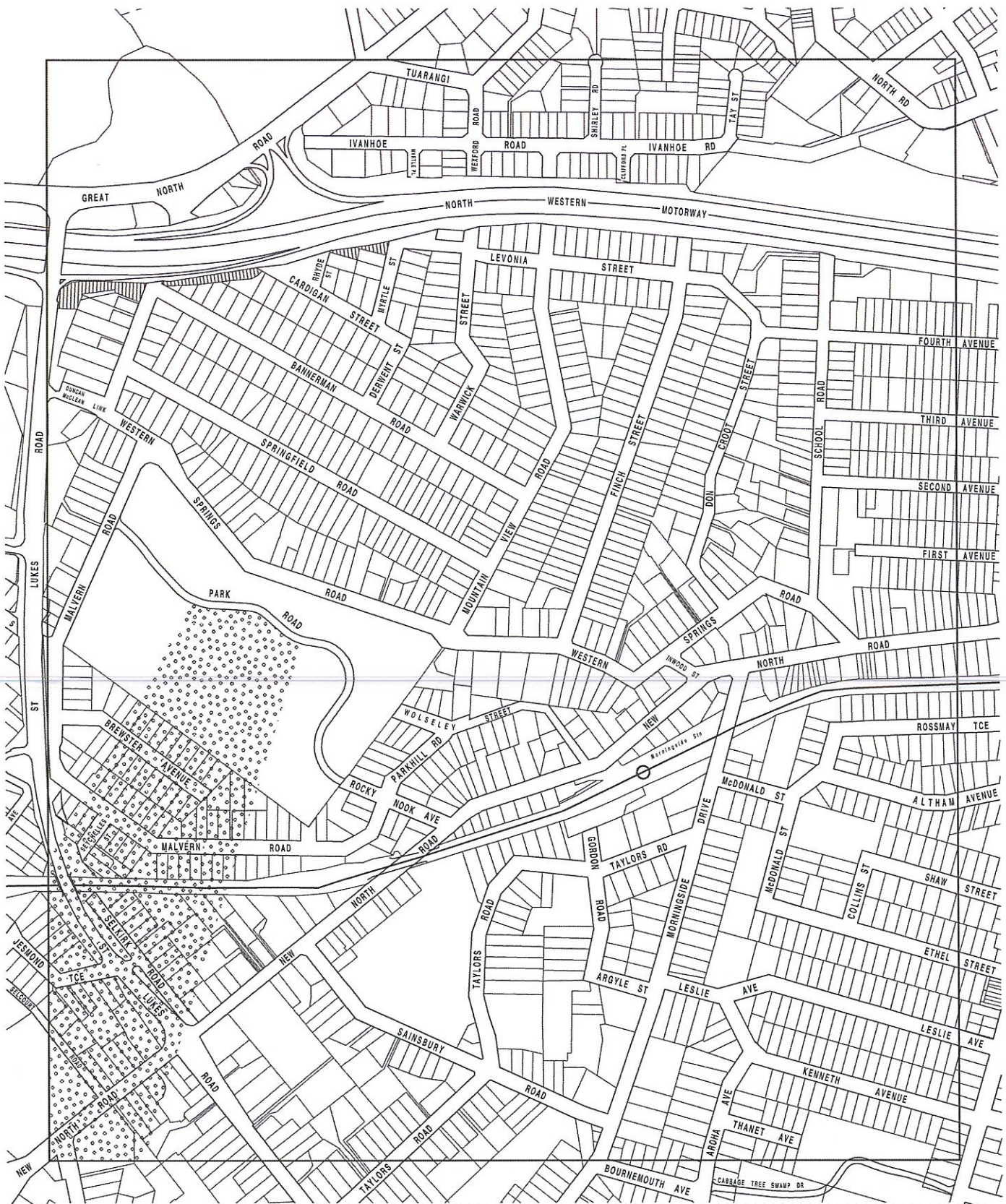
**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999







**D06**

C05 C06 C07  
D05 D07  
E05 E06 E07

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



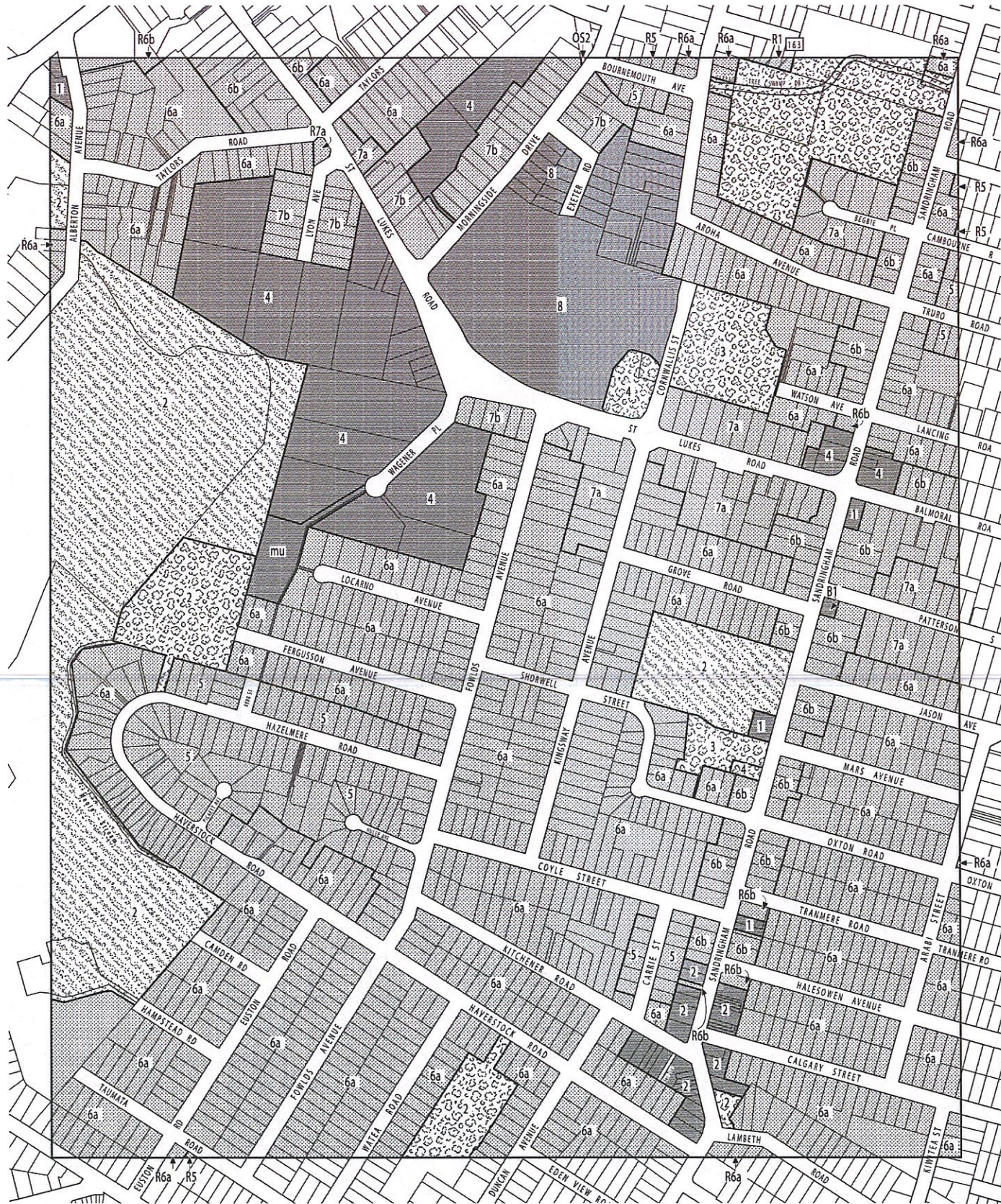
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CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

		<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
		<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
		<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
		<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
		<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
				<b>District Boundary</b>





**E06**

D05	D06	D07
E05	E07	
F05	F06	F07

**PLANNING MAP No 1 ZONING**



0 1:7000 200m



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

	Residential Activity Zones		Boundary between zones
	Business Activity Zones		Special Parking Zones
	Special Purpose Activity Zones		Footways
	Open Space Activity Zones		Service Lanes
			Motorways, Roads
			Central Area Boundary
			District Boundary

UPDATED 27/04/12





Reference Numbers Designated Works Additional Development Controls Former Landfill Areas Sites subject to both Retail Frontage and Verandah Controls Sites subject to Verandah Control only Special Yard Requirement Buildings, Objects or Places Trees (singular) Groups of trees (two or more)	Archaeological and Geological Features Archaeological Feature only Geological Feature only Maori Heritage Sites Significant Ecological Areas Cliffline Tree Amenity Area Tamaki Drive Scenic Way Protection of Sunlight Admission Control to Broadway Building Line Restrictions Vehicular Access Restrictions Central Area Boundary	Interchange Control Areas Pedestrian Malls Footways Service Lanes Local Roads Collector Roads District Arterial Roads Regional Arterial Roads Strategic Routes <p>All public roads are subject to designation B08-04</p> District Boundary
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D05	D06	D07	<b>E06</b>
E05	E07		
F05	F06	F07	

PLANNING MAP No 2  
ADDITIONAL LIMITATIONS

0 1:7000 200m

CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

UPDATED 28/03/12





**E06**

D05 D06 D07  
E05 E07  
F05 F06 F07

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



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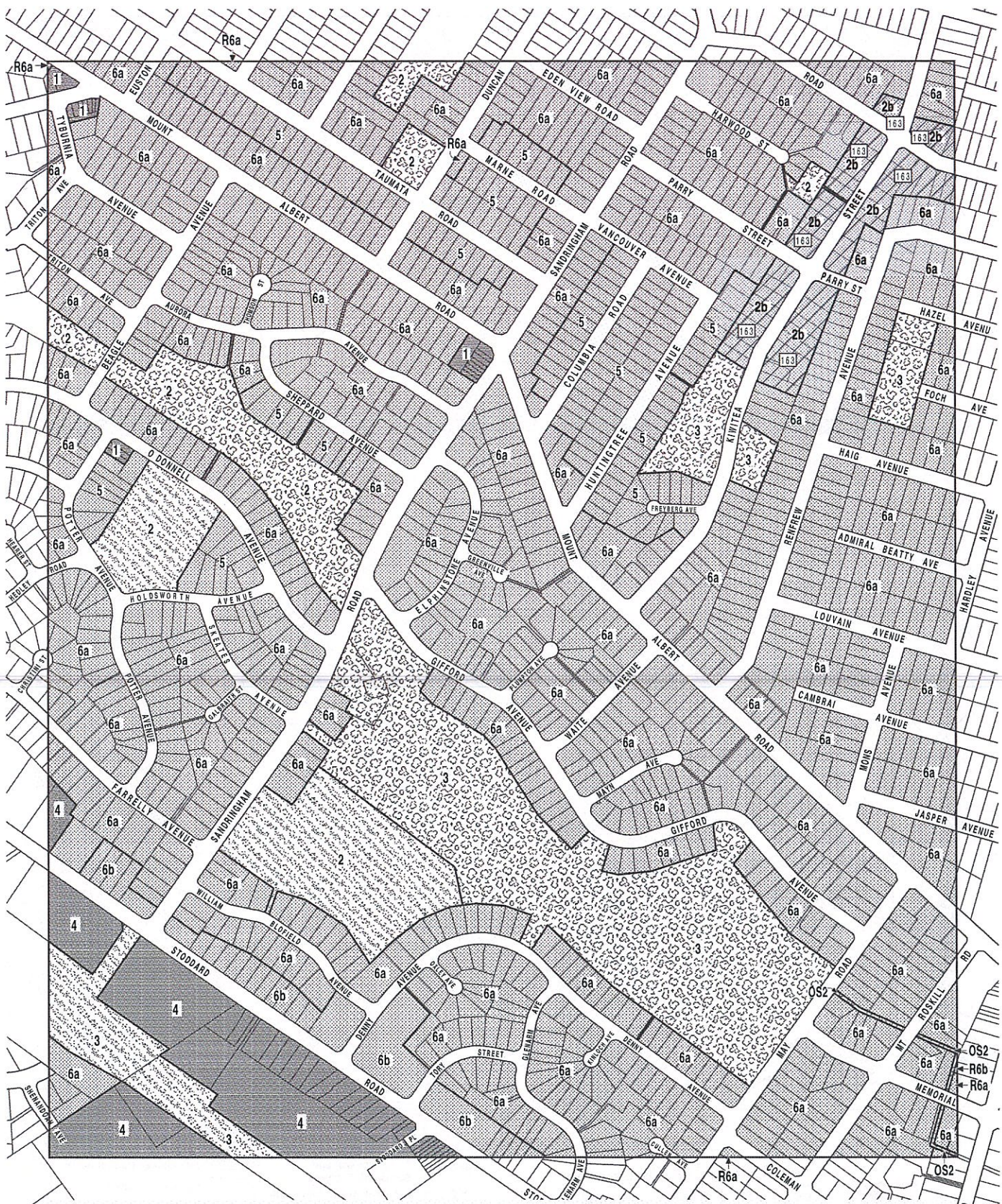


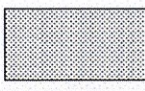










CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

		Reference Numbers		D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour & Gulf
		H05-04 Airport Approach Height Control		E05-29 View Protection - Volcanic Cones Affected Areas
		B04-01 Coastal Management Area		H09-13 View Protection - Onehunga Motorway Affected Areas
		B09-01 View Protection - War Memorial Museum Affected Areas		Footways
		D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson		Service Lanes
				District Boundary

UPDATED 29/03/05





	Residential Activity Zones		Boundary between zones
	Business Activity Zones		Special Parking Zones
	Special Purpose Activity Zones		Footways
	Open Space Activity Zones		Service Lanes
			Motorways, Roads
			Central Area Boundary
			District Boundary

UPDATED 28/02/07

E05	E06	E07	<b>F06</b>
F05	F07		
G05	G06	G07	

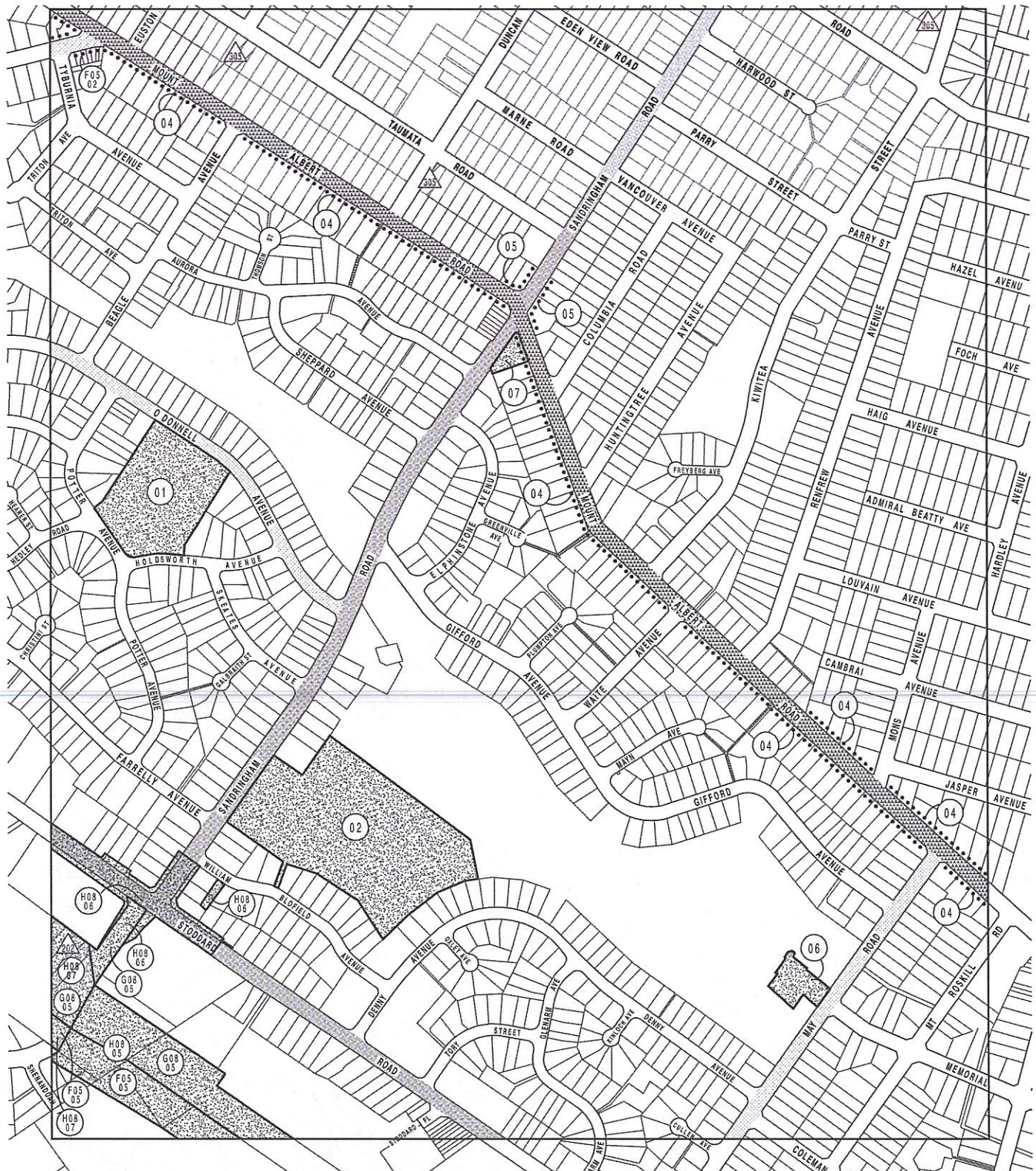
**PLANNING MAP No 1  
ZONING**


CITY OF AUCKLAND  
 DISTRICT PLAN  
 ISTHMUS SECTION  
 - OPERATIVE 1999



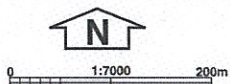




**F06**

E05	E06	E07
F05		F07
G05	G06	G07

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**

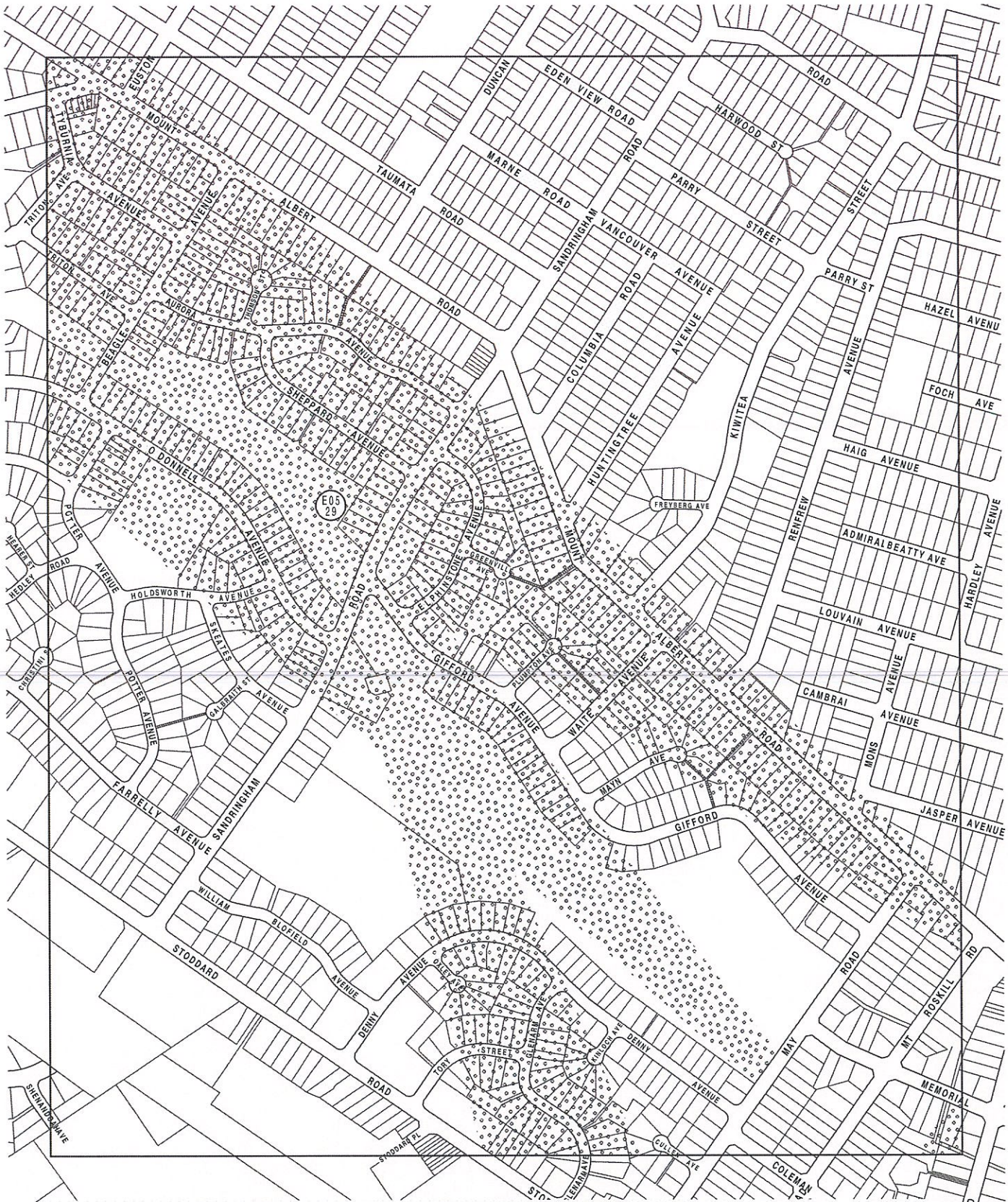


**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular)		Building Line Restrictions		Strategic Routes
	Groups of trees (two or more)		Vehicular Access Restrictions		All public roads are subject to designation B08-04
			Central Area Boundary		District Boundary

UPDATED 15/11/11





		<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
		<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
		<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
		<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
		<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
				<b>District Boundary</b>

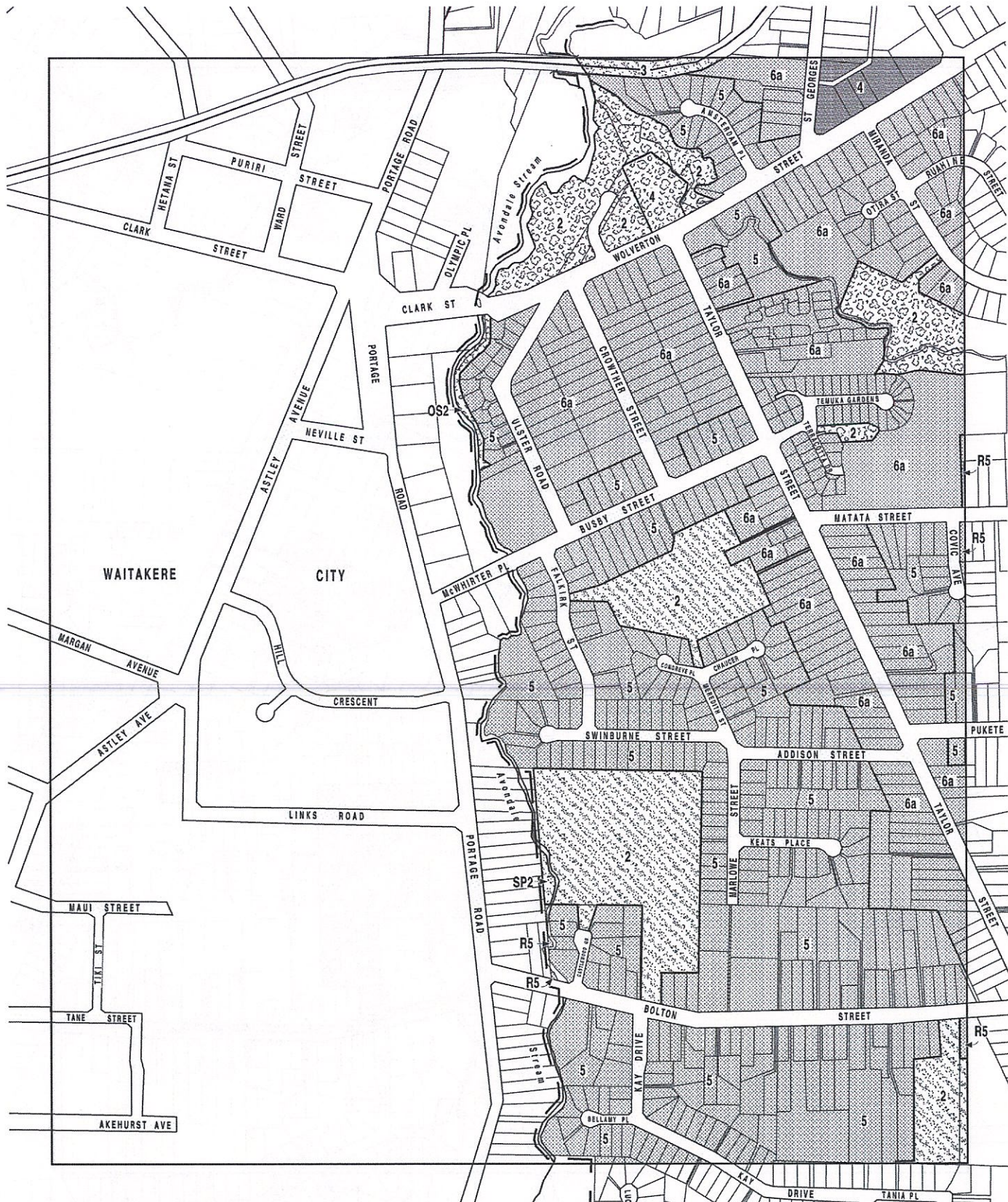
E05	E06	E07	<b>F06</b>
F05	F07		
G05	G06	G07	

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**

0 1:7000 200m

CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999





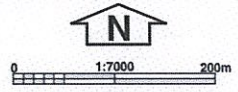
	Residential Activity Zones		Boundary between zones
	Business Activity Zones		Special Parking Zones
	Special Purpose Activity Zones		Footways
	Open Space Activity Zones		Service Lanes
			Motorways, Roads
			Central Area Boundary
			District Boundary

UPDATED 11/02/03

F02	F03	F04
	G04	
H03	H04	

**G03**

**PLANNING MAP No 1  
ZONING**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

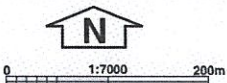




**G03**

F02	F03	F04
		G04
		H03 H04

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**

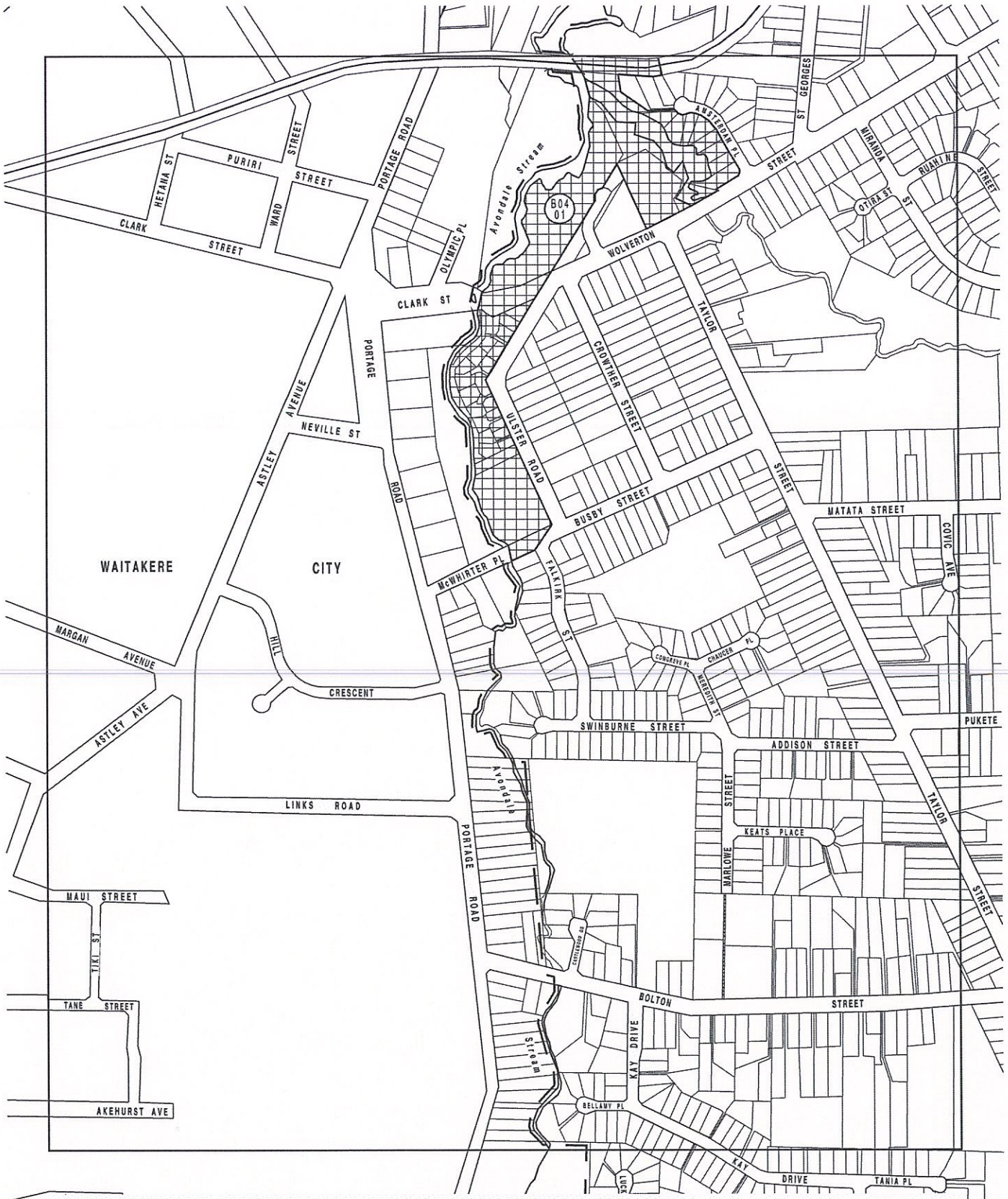


CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular)		Building Line Restrictions		Strategic Routes
	Groups of trees (two or more)		Vehicular Access Restrictions		All public roads are subject to designation B08-04
			Central Area Boundary		District Boundary

UPDATED 05/05/10



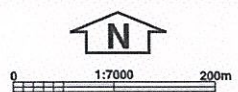


	<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
	<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
	<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
	<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
	<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
			<b>District Boundary</b>

F02	F03	F04
	G04	
H03	H04	

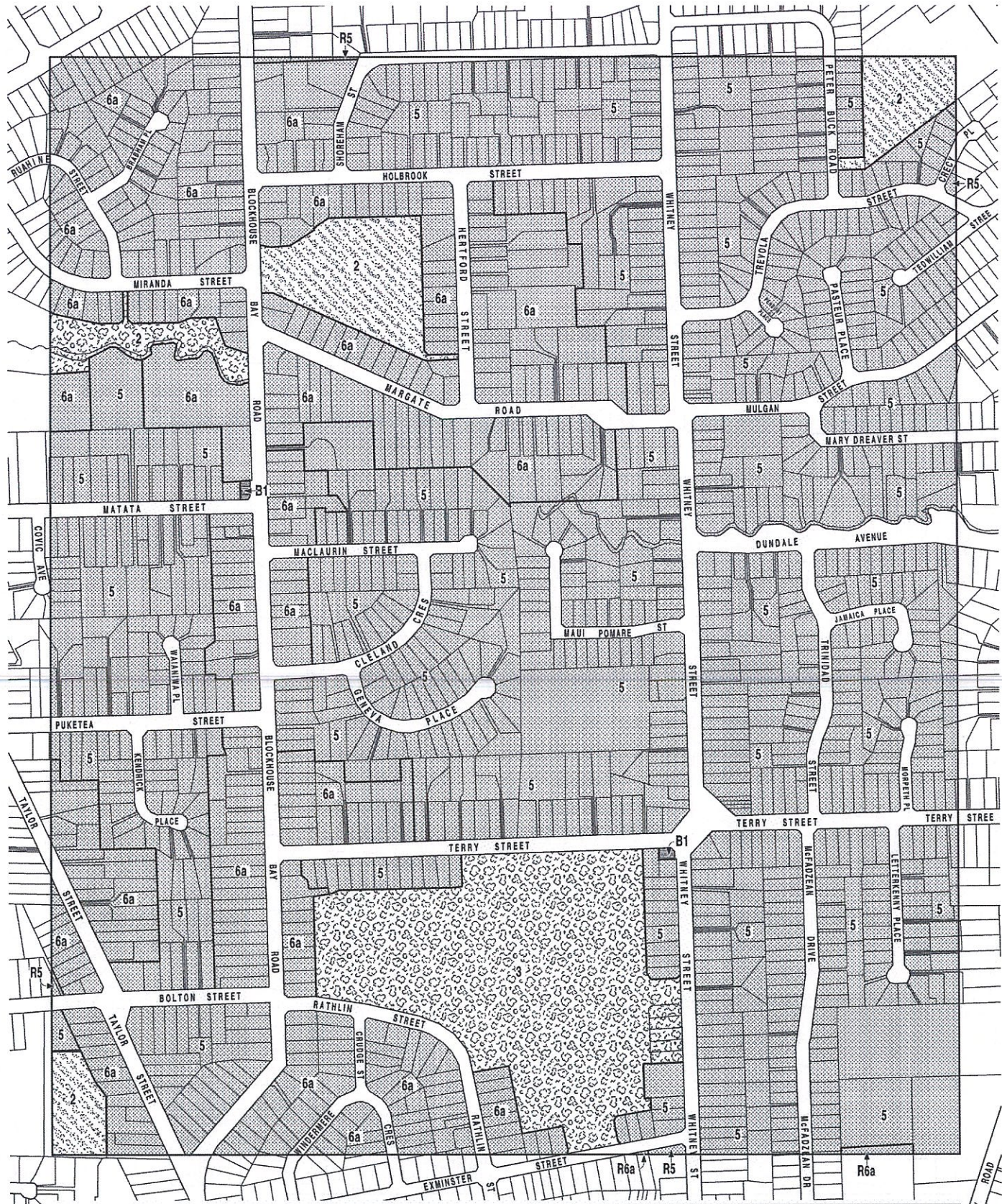
**G03**

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**





**G04**

F03 F04 F05  
G03 G05  
H03 H04 H05

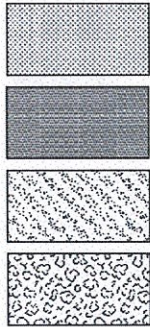
**PLANNING MAP No 1  
ZONING**



0 1:7000 200m



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999



Residential Activity Zones

Business Activity Zones

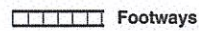
Special Purpose Activity Zones

Open Space Activity Zones

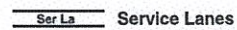


Boundary between zones

Special Parking Zones



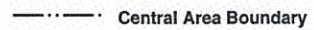
Footways



Service Lanes



Motorways, Roads



Central Area Boundary



District Boundary

UPDATED 26/03/01



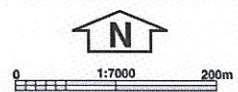


		<b>Reference Numbers</b>		<b>Archaeological and Geological Features</b>		<b>Interchange Control Areas</b>
		<b>Designated Works</b>		<b>Archaeological Feature only</b>		<b>Pedestrian Malls</b>
		<b>Additional Development Controls</b>		<b>Geological Feature only</b>		<b>Footways</b>
		<b>Former Landfill Areas</b>		<b>Maori Heritage Sites</b>		<b>Service Lanes</b>
		<b>Sites subject to both Retail Frontage and Verandah Controls</b>		<b>Significant Ecological Areas</b>		<b>Local Roads</b>
		<b>Sites subject to Verandah Control only</b>		<b>Cliffline Tree Amenity Area</b>		<b>Collector Roads</b>
		<b>Special Yard Requirement</b>		<b>Tamaki Drive Scenic Way</b>		<b>District Arterial Roads</b>
		<b>Buildings, Objects or Places</b>		<b>Protection of Sunlight Admission Control to Broadway</b>		<b>Regional Arterial Roads</b>
		<b>Trees (singular)</b>		<b>Building Line Restrictions</b>		<b>Strategic Routes</b>
		<b>Groups of trees (two or more)</b>		<b>Vehicular Access Restrictions</b>		
				<b>Central Area Boundary</b>		
						<b>All public roads are subject to designation B08-04</b>
						<b>District Boundary</b>

F03	F04	F05
G03	G05	
H03	H04	H05

**G04**

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999



UPDATED 05/05/10





**G04**

F03	F04	F05
G03	G05	
H03	H04	H05

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



0 1:7000 200m



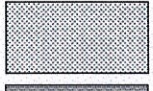



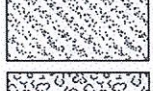






CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

	<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
	<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
	<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
	<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
	<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
			<b>District Boundary</b>

BOUNDARY ROAD

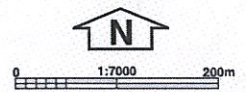





	Residential Activity Zones		Boundary between zones
	Business Activity Zones		Special Parking Zones
	Special Purpose Activity Zones		Footways
	Open Space Activity Zones		Service Lanes
			Motorways, Roads
			Central Area Boundary
			District Boundary

F04	F05	F06
G04	<b>G05</b>	
H04	H05	H06

**PLANNING MAP No 1  
ZONING**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999







**G05**

F04	F05	F06
G04	G06	
H04	H05	H06

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**



0 1:7000 200m



**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular)		Building Line Restrictions		Strategic Routes
	Groups of trees (two or more)		Vehicular Access Restrictions		All public roads are subject to designation B08-04
			Central Area Boundary		District Boundary

UPDATED 05/05/10



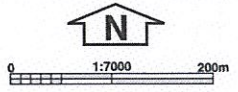


	<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
	<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
	<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
	<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
	<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
			<b>District Boundary</b>

F04	F05	F06
G04	G06	
H04	H05	H06

**G05**

**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999







**G06**

F05	F06	F07
G05	G07	
H05	H06	H07

**PLANNING MAP No 1  
ZONING**



0 1:7000 200m

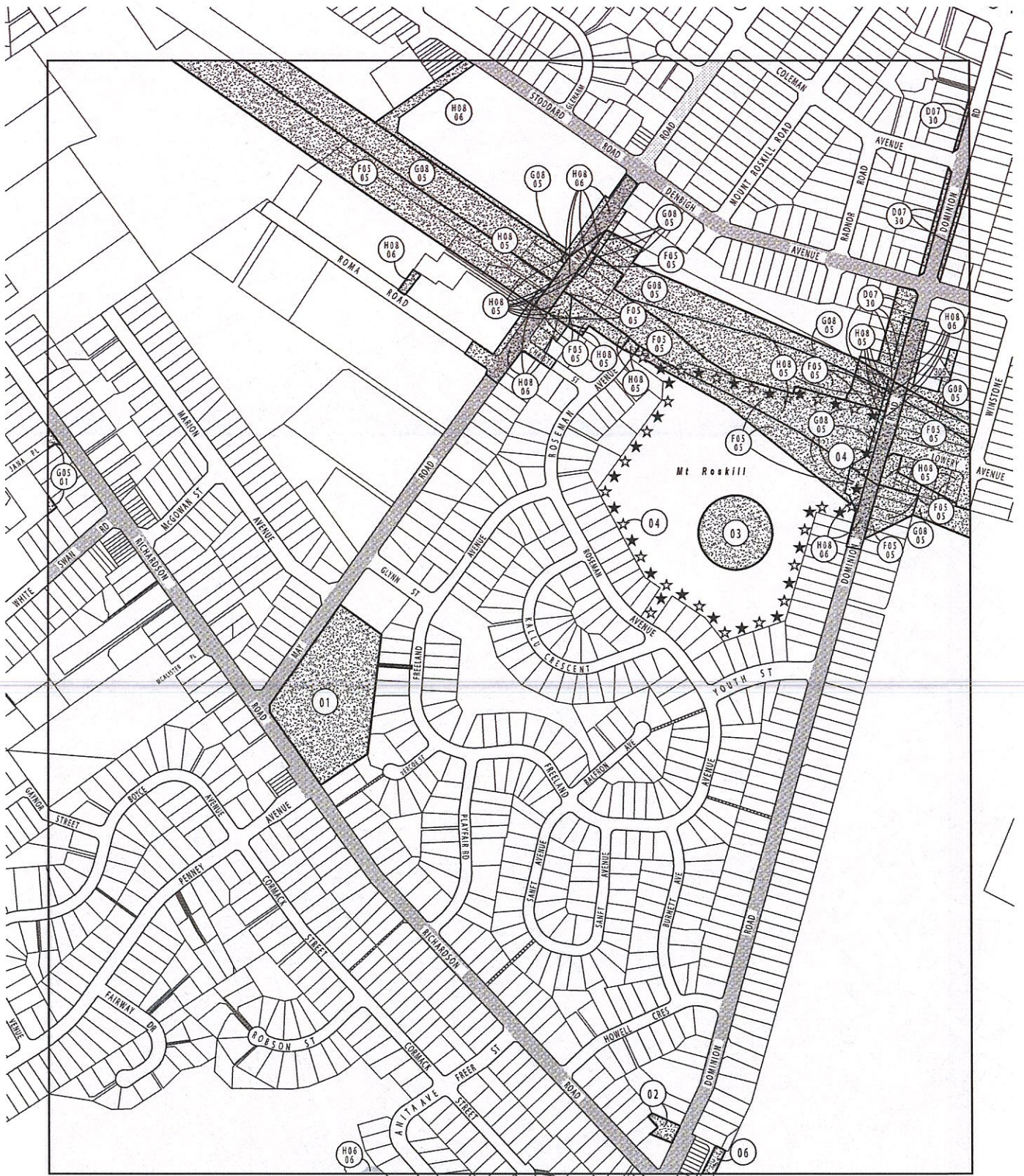


**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

	<b>Residential Activity Zones</b>		<b>Boundary between zones</b>
	<b>Business Activity Zones</b>		<b>Special Parking Zones</b>
	<b>Special Purpose Activity Zones</b>		<b>Footways</b>
	<b>Open Space Activity Zones</b>		<b>Service Lanes</b>
			<b>Motorways, Roads</b>
			<b>Central Area Boundary</b>
			<b>District Boundary</b>

UPDATED 28/02/07





	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular)		Building Line Restrictions		Strategic Routes
	Groups of trees (two or more)		Vehicular Access Restrictions		District Boundary
			Central Area Boundary		

All public roads are subject to designation B08-04

UPDATED 21/05/12

F05	F06	F07	<b>G06</b>
G05	G07		
H05	H06	H07	

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**

0 1:7000 200m

CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

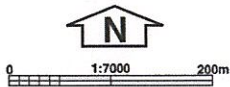




**G06**

F05	F06	F07
G05	G07	
H05	H06	H07

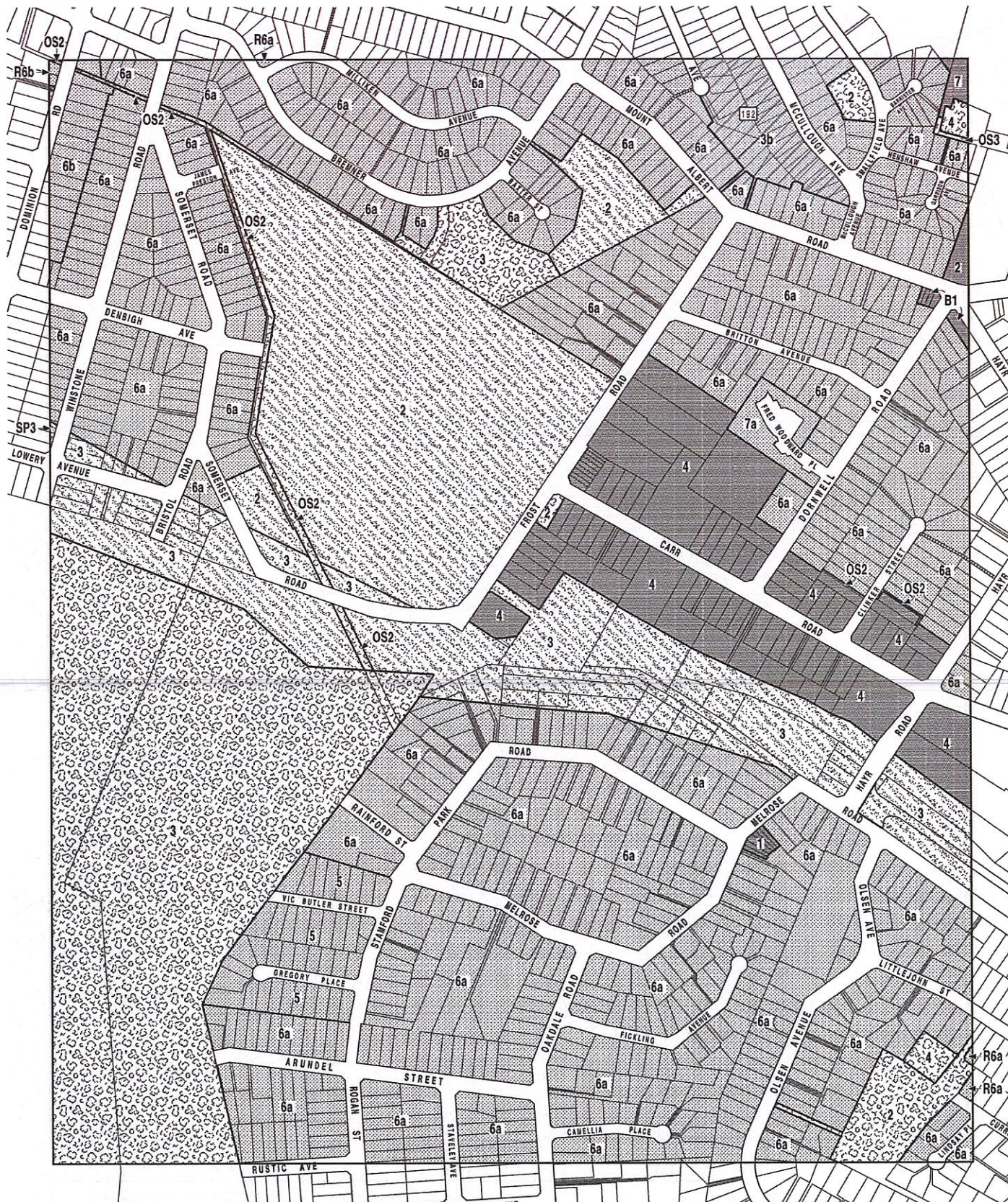
**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

	<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
	<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
	<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
	<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
	<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
			<b>District Boundary</b>





	Residential Activity Zones		Boundary between zones
	Business Activity Zones		Special Parking Zones
	Special Purpose Activity Zones		Footways
	Open Space Activity Zones		Service Lanes
			Motorways, Roads
			Central Area Boundary
			District Boundary

UPDATED 20/09/07

F06	F07	F08
G06	G08	<b>G07</b>
H06	H07	

**PLANNING MAP No 1 ZONING**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

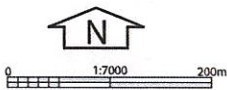




**G07**

F06	F07	F08
G06	G08	
H06	H07	H08

**PLANNING MAP No 2  
ADDITIONAL LIMITATIONS**

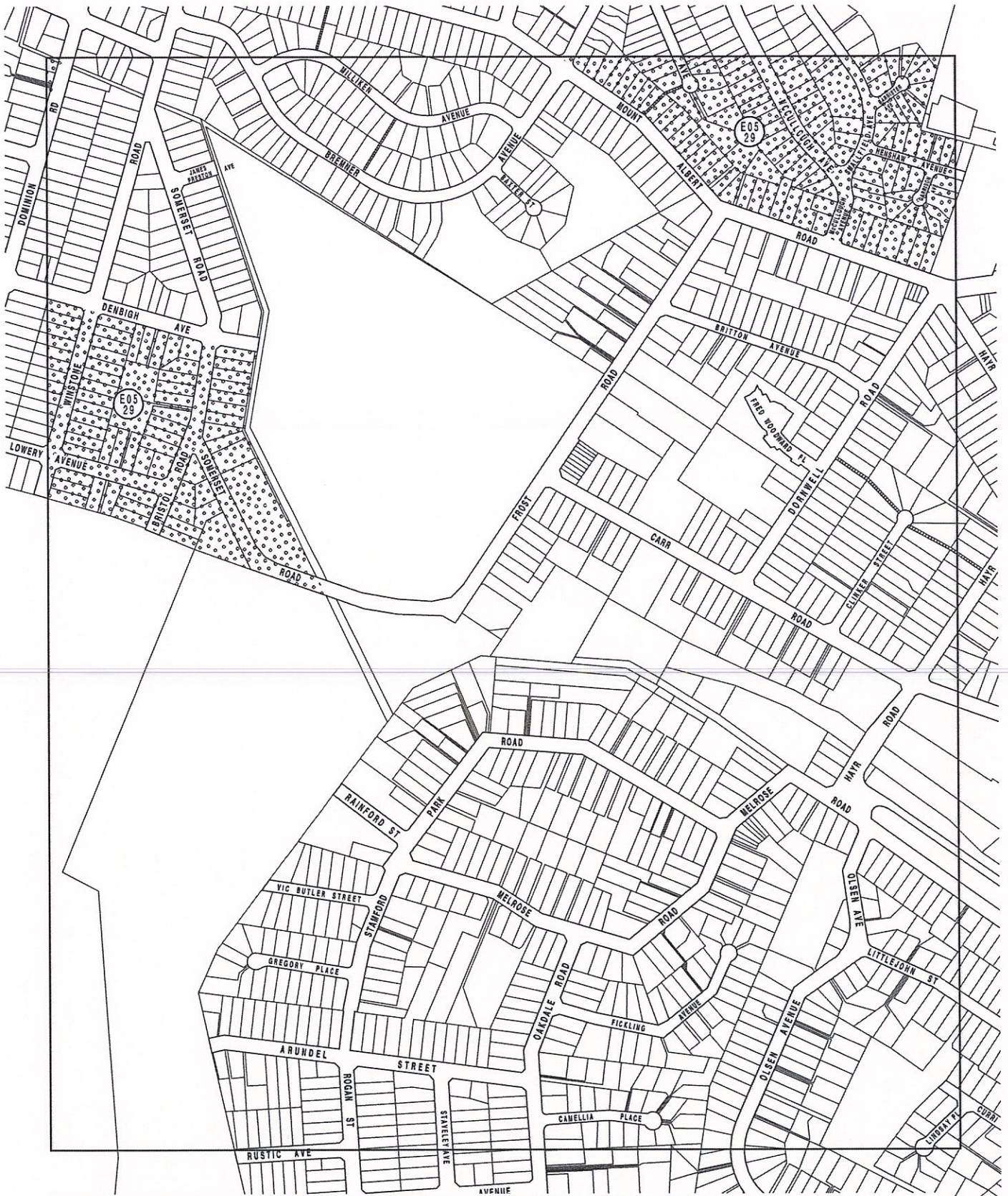


**CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999**

<p><b>10</b> / <b>G12</b> / <b>G17</b> Reference Numbers</p> <p> Designated Works</p> <p> Additional Development Controls</p> <p> Former Landfill Areas</p> <p> Sites subject to both Retail Frontage and Verandah Controls</p> <p> Sites subject to Verandah Control only</p> <p> Special Yard Requirement</p> <p> Buildings, Objects or Places</p> <p> Trees (singular)</p> <p> Groups of trees (two or more)</p>	<p> Archaeological and Geological Features</p> <p> Archaeological Feature only</p> <p> Geological Feature only</p> <p> Maori Heritage Sites</p> <p> Significant Ecological Areas</p> <p> Cliffline Tree Amenity Area</p> <p> Tamaki Drive Scenic Way</p> <p> Protection of Sunlight Admission Control to Broadway</p> <p> Building Line Restrictions</p> <p> Vehicular Access Restrictions</p> <p> Central Area Boundary</p>	<p> Interchange Control Areas</p> <p> Pedestrian Malls</p> <p> Footways</p> <p> Ser La Service Lanes</p> <p> Local Roads</p> <p> Collector Roads</p> <p> District Arterial Roads</p> <p> Regional Arterial Roads</p> <p> Strategic Routes</p> <p>All public roads are subject to designation B08-04</p> <p> District Boundary</p>
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UPDATED 15/06/12



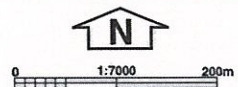


		<b>Reference Numbers</b>		<b>D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour &amp; Gulf</b>
		<b>H05-04 Airport Approach Height Control</b>		<b>E05-29 View Protection - Volcanic Cones Affected Areas</b>
		<b>B04-01 Coastal Management Area</b>		<b>H09-13 View Protection - Onehunga Motorway Affected Areas</b>
		<b>B09-01 View Protection - War Memorial Museum Affected Areas</b>		<b>Footways</b>
		<b>D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson</b>		<b>Service Lanes</b>
				<b>District Boundary</b>

F06 F07 F08  
G06 G08  
H06 H07 H08

**G07**

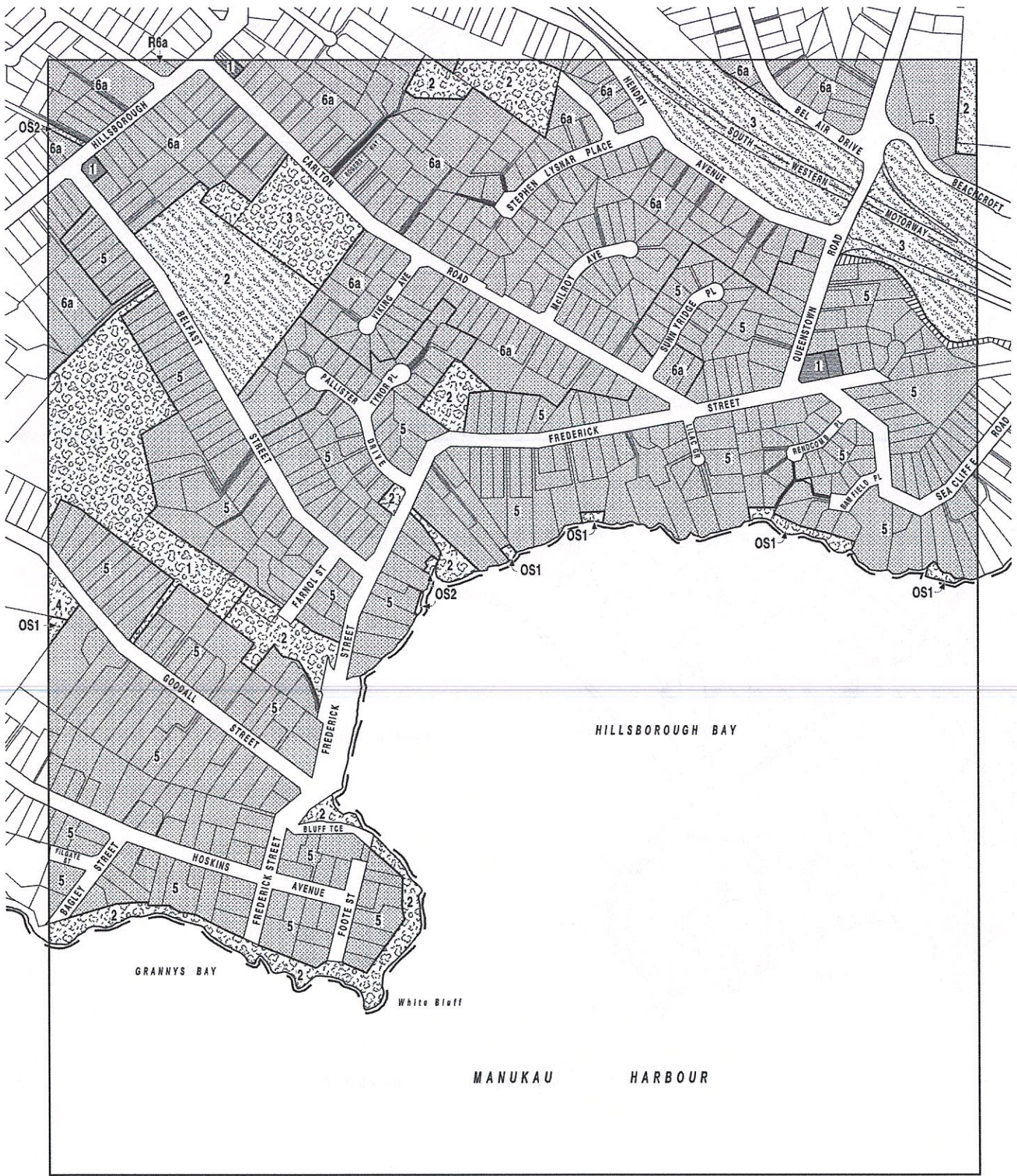
**PLANNING MAP No 3  
ADDITIONAL LIMITATIONS**



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999







**H08**

G07	G08	G09
H07	H08	H09

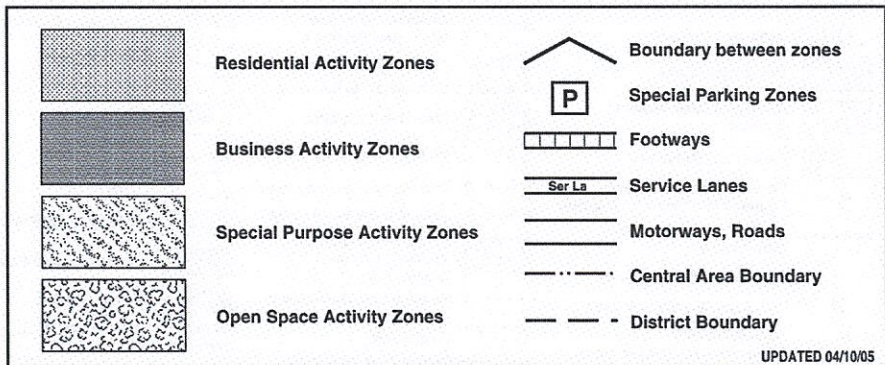
**PLANNING MAP No 1 ZONING**



0 1:7000 200m

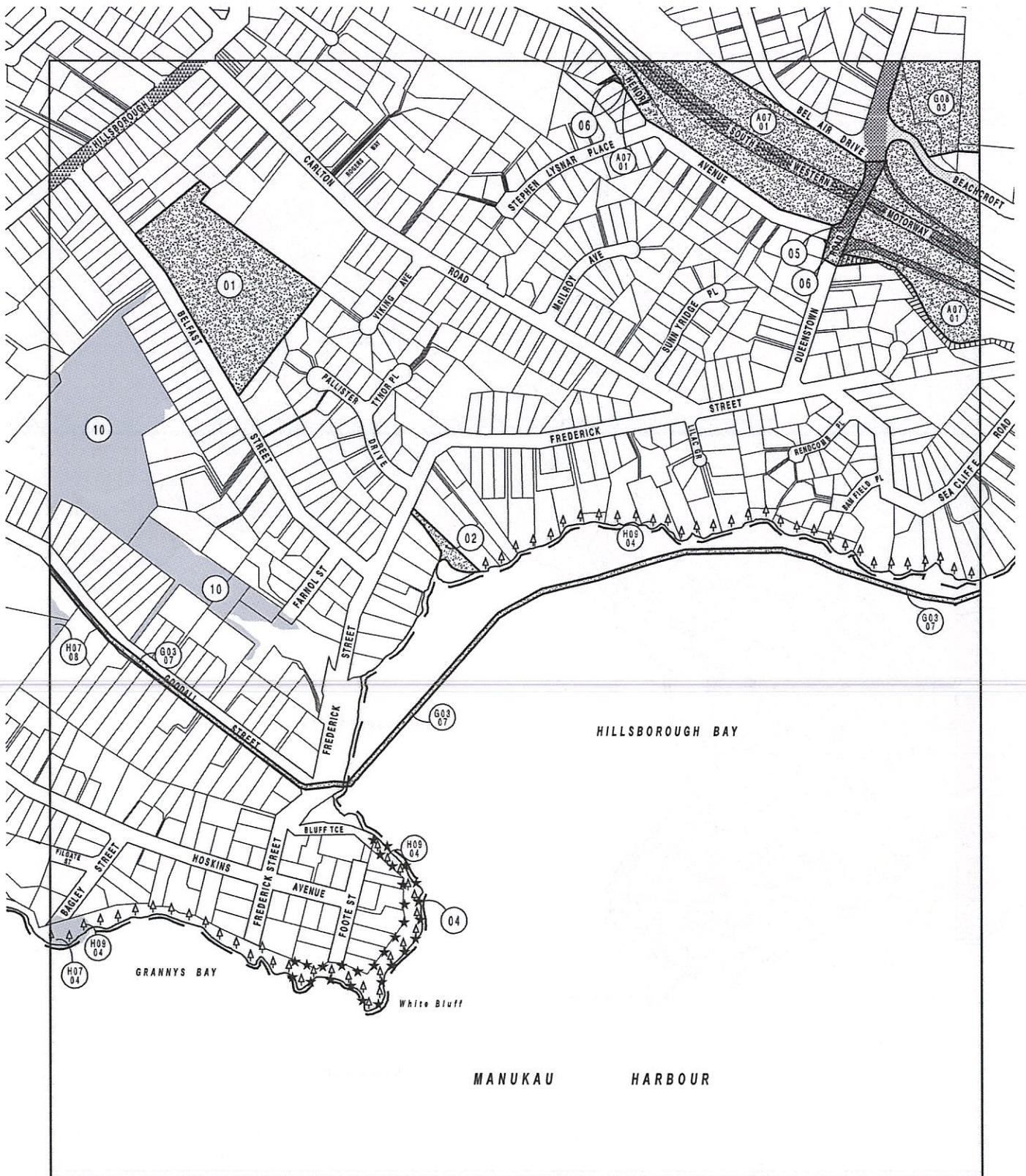


CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999



UPDATED 04/10/05



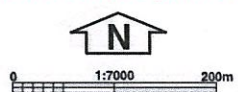


	Reference Numbers		Archaeological and Geological Features		Interchange Control Areas
	Designated Works		Archaeological Feature only		Pedestrian Malls
	Additional Development Controls		Geological Feature only		Footways
	Former Landfill Areas		Maori Heritage Sites		Service Lanes
	Sites subject to both Retail Frontage and Verandah Controls		Significant Ecological Areas		Local Roads
	Sites subject to Verandah Control only		Cliffline Tree Amenity Area		Collector Roads
	Special Yard Requirement		Tamaki Drive Scenic Way		District Arterial Roads
	Buildings, Objects or Places		Protection of Sunlight Admission Control to Broadway		Regional Arterial Roads
	Trees (singular)		Building Line Restrictions		Strategic Routes
	Groups of trees (two or more)		Vehicular Access Restrictions		All public roads are subject to designation B08-04
			Central Area Boundary		District Boundary

G07	G08	G09
H07	H08	H09

# H08

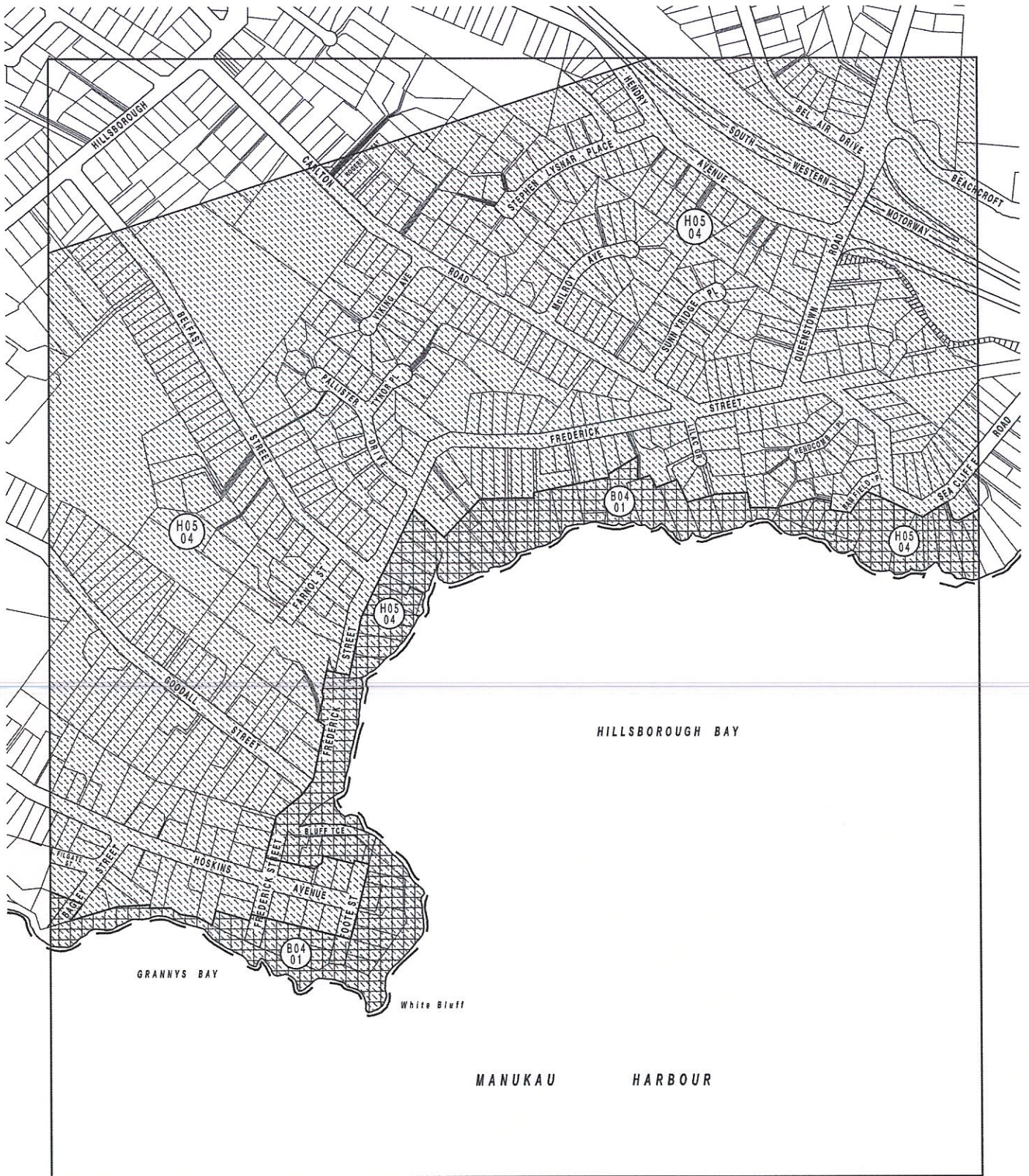
## PLANNING MAP No 2 ADDITIONAL LIMITATIONS



CITY OF AUCKLAND  
DISTRICT PLAN  
ISTHMUS SECTION  
- OPERATIVE 1999

UPDATED 25/02/11





# H08

G07 G08 G09  
H07 H08 H09

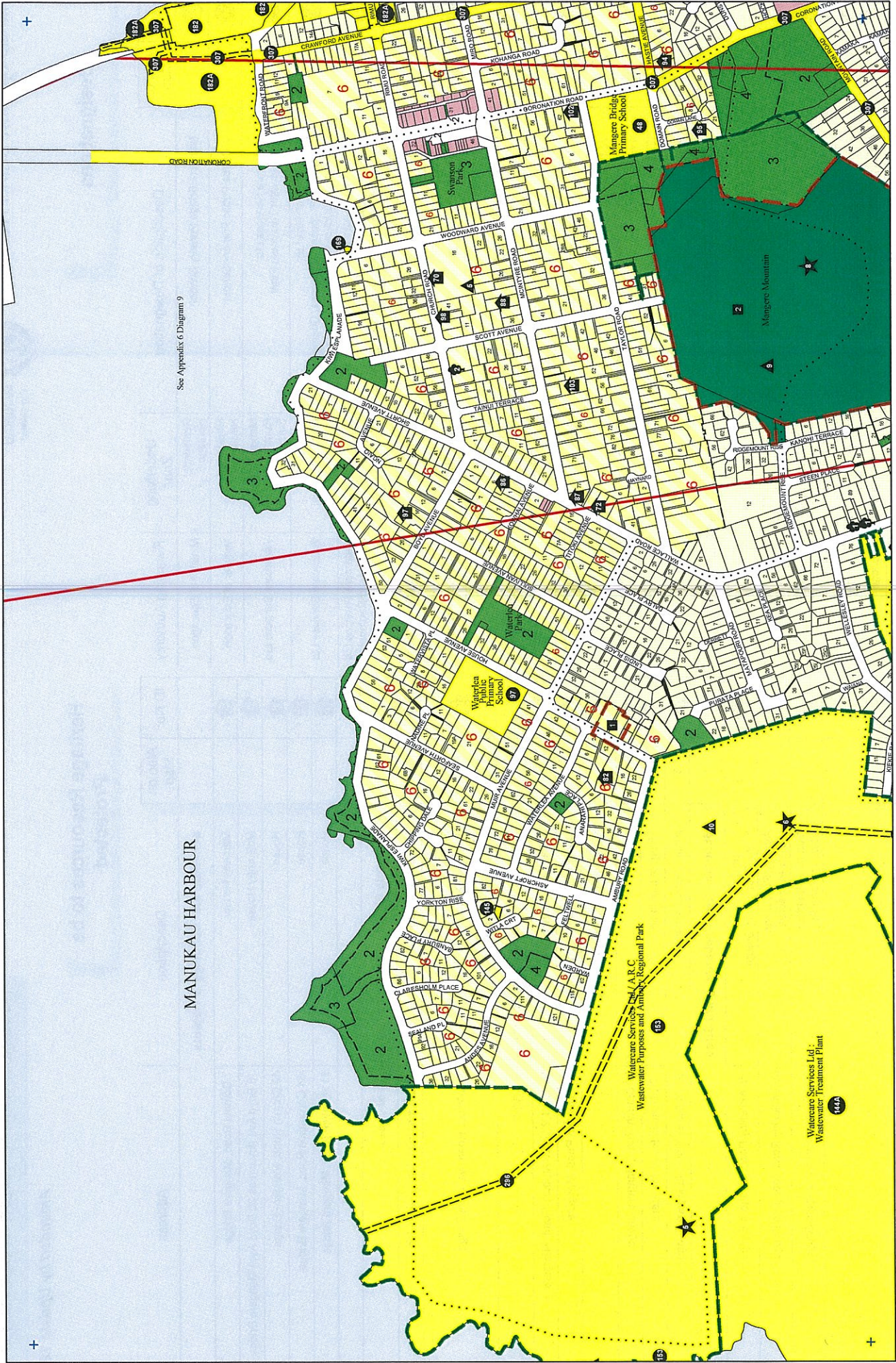
## PLANNING MAP No 3 ADDITIONAL LIMITATIONS

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**CITY OF AUCKLAND**  
 DISTRICT PLAN  
 ISTHMUS SECTION  
 - OPERATIVE 1999

	Reference Numbers		D09-34 View Protection - Newmarket Viaduct Affected Areas - Harbour & Gulf
	H05-04 Airport Approach Height Control		E05-29 View Protection - Volcanic Cones Affected Areas
	B04-01 Coastal Management Area		H09-13 View Protection - Onehunga Motorway Affected Areas
	B09-01 View Protection - War Memorial Museum Affected Areas		Footways
	D09-33 View Protection - Newmarket Viaduct Affected Areas - Mt Hobson		Service Lanes
			District Boundary





See Appendix 6 Diagram 9

MANUKAU HARBOUR

Watercare Services Ltd / A.R.C  
Wastewater Purposes and Ambient Regional Park

Watercare Services Ltd  
Wastewater Treatment Plant

1	5	10
2	6	11
3	7	12

Scale 1:6000 at A3

Amended by Update 12

# Manukau Operative District Plan 2002



Te Kamihira o  
**MANUKAU**  
City Council



## Designations

## Heritage Resources to be Protected

ID No:	Also on Map	Description of Designation	Underlying Zone	Requiring Authority
48		Mangere Bridge Primary School	Residential Heritage 6	Minister of Education
97		Waterlea Public Primary School	Residential Heritage 6	Minister of Education
144A	1, 2, 3, 6, 7, 8	Watercare Services Ltd – Wastewater Treatment Plant	Mangere Puhinui Rural Surface of River	Watercare Services Ltd
145		Watercare Services Ltd: Wastewater Purposes - Pipelines, Chambers and Associated Structures	Main Residential	Watercare Services Ltd
153	1 & 6	Watercare Services Ltd: Auckland Regional Council Wastewater Purposes and Ambury Regional Park	Mangere Puhinui Rural	Watercare Services Ltd & Auckland Regional Council
169		Watercare Services Ltd: Wastewater Purposes - Pumping Station and Associated Structures	Public Open Space 5	Watercare Services Ltd
182	10, 11, 12, 17, 18	South Western Motorway (State Highway 20)	Primary Road	Transit New Zealand
182A	10	Manukau Harbour Crossing (See Diagram 3 in Appendix 10 of the Planning Maps for detail)	Public Open Space 2, 3 & 5, Primary Road, Secondary Road, Main Residential, Papakalanga Zone	Transit New Zealand
286	6, 7, 12, 13, 18, 19	Petroleum Transmission Purposes	Various	New Zealand Refining Company Limited
307	6, 7, 10, 12, 13, 18, 27, 28, 40, 41, 51	Water Supply Purposes (See Diagram 3 in Appendix 10 of the Planning Maps for detail)	Various	Watercare Services Ltd

## Heritage Resources to be Protected

ID No:	Also on Map	Description	Address
70		<b>Schedule 6A - Buildings &amp; Objects</b>	
72		St James Church	27 Church Road, Mangere Bridge
82		Kauri Cottage	31 Wallace Road, Mangere Bridge
84		House 'Waterlea'	14 Ambury Road, Mangere Bridge
86		Barrow House	49 Church Road, Mangere Bridge
87		Ambury Cottage	8 Wallace Road, Mangere Bridge
88		Fischers Store	25 Wallace Road, Mangere Bridge
94		House	32 McIntyre Road, Mangere Bridge
94		House	79 Coronation Road, Mangere Bridge

ID No:	Also on Map	Description	Address
		<b>Schedule 6A - Buildings &amp; Objects</b>	
95		Margetts House	7 Domain Road, Mangere Bridge
97		McBurney House	18 Boyd Ave (known as 20 Boyd Ave) Mangere Bridge
98		House	43 Church Road, Mangere Bridge
102		House	64 Coronation Road, Mangere Bridge
102		House	51 McIntyre Road, Mangere Bridge
		<b>Schedule 6B - Notable Trees and Stands of Trees</b>	
102		3 x Norfolk Island Pine	49 Church Road, Mangere Bridge
103	6	1 x Elm 2 x Puriri 1 x Pohutukawa (See Diagram 1 in Appendix 3 of the Planning Maps)	87 Wallace Road, Mangere Bridge
		<b>Schedule 6E - Geological Features and Areas</b>	
1		Ambury Road Lava Cave	15, 19, 21, 23 & 25 Ambury Road, Mangere
2	6	Mangere Mountain Scoria Cone	17R Domain Road, Mangere
		<b>Schedule 6F - Waahi Tapu</b>	
4		Urupa	27 Church Road, Mangere Bridge
9	6	Mangere Mountain	17R Domain Road, Mangere
10	6	Ambury Park Stonefields	66 Wellesley Road, Mangere Bridge
		<b>Schedule 6G - Archaeological Sites</b>	
5		Ambury Park Stone Structures ( Group)	66 Wellesley Road, Mangere Bridge
6		Ambury Park Stone Walled enclosures	66 Wellesley Road, Mangere Bridge
8		Mangere Mountain Volcanic Cone Pa	17R Domain Road, Mangere Bridge

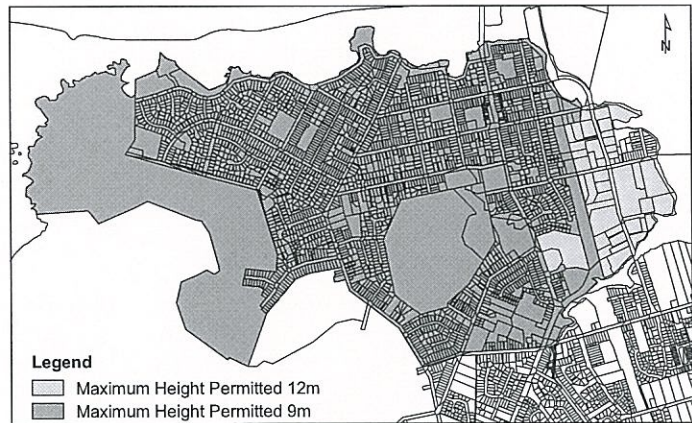
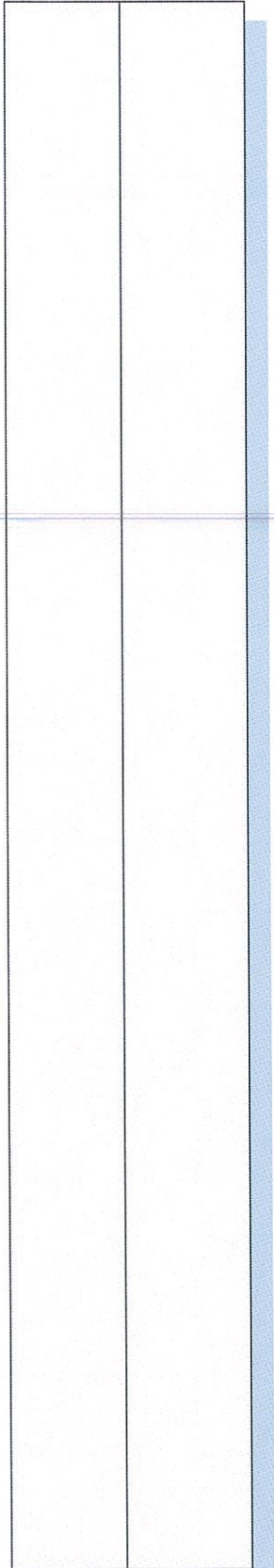


**ADDITIONAL DOCUMENTATION FOR  
DISTRICT PLAN MAP 5**

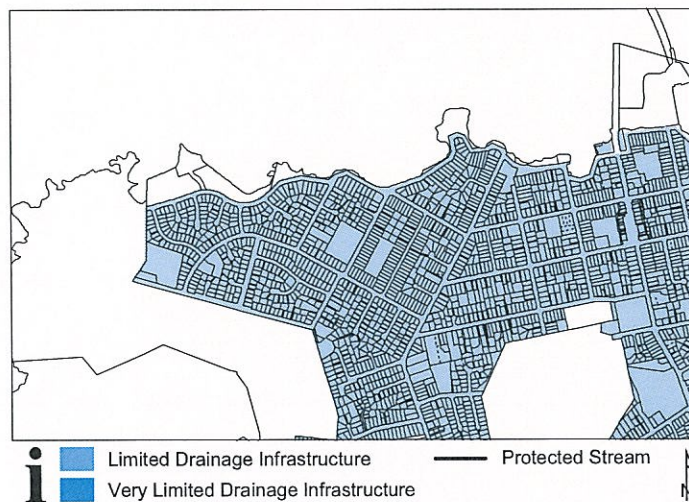
*Manukau Operative District Plan 2002*



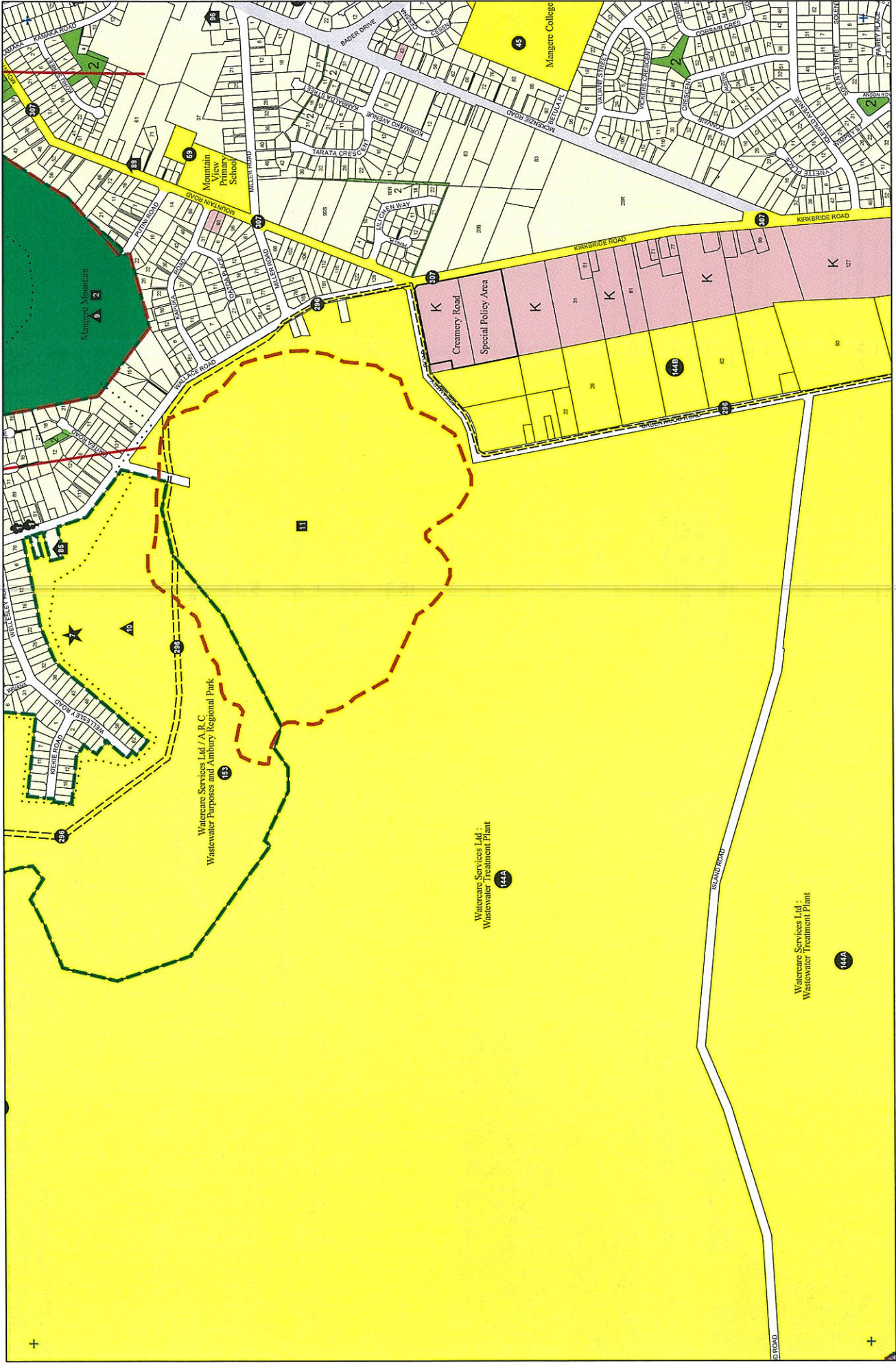
*Amended by Update 11*



**MANGERE BLANKET HEIGHT RESTRICTION ZONE:**  
The area depicted on this map identifies maximum height limits that the Auckland Regional Council consider important in the terms of protecting regionally significant views (See 13.13.6.2.1 (d) (ii))  
SOURCE: Auckland Regional Council Auckland Regional Policy Statement Map Series 4, Sheet 3







1	5	10
2	6	11
3	7	12

Scale 1:8000 at A3

# Manukau Operative District Plan 2002

Amended by Update 12



Te Kamihara o  
**MANUKAU**  
City Council



### Designations

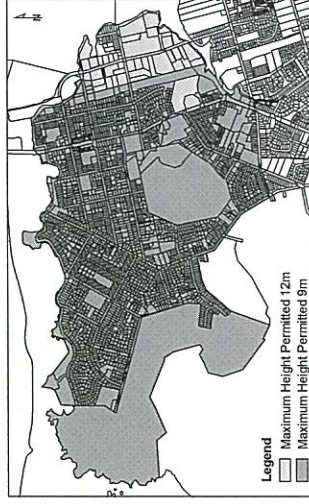
ID No:	Also on Map	Description of Designation	Underlying Zone	Requiring Authority
45	11	Mangere College	Main Residential	Minister of Education
58		Mountain View Primary School	Main Residential	Minister of Education
44A	1, 2, 3, 5, 7, 8	Watercare Services Ltd - Wastewater Treatment Plant	Mangere Puhinui Rural Surface of River	Watercare Services Ltd
44E	7	Wastewater Treatment Purposes and Odour Buffer Area	Mangere Puhinui Rural	Watercare Services Ltd
153	1, 5	Watercare Services Ltd/ Auckland Regional Council: Wastewater Purposes and Ambury Regional Park Explanatory Statement: (See Schedule 5A)	Mangere Puhinui Heritage	Watercare Services Ltd & Auckland Regional Council
206	5, 7, 12, 13, 18, 19	Petroleum Transmission Purposes	Various	New Zealand Refining Company Limited
307	5, 7, 10, 12, 13, 18, 27, 28, 40, 41, 51	Water Supply Purposes	Various	Watercare Services Ltd

### Heritage Resources to be Protected

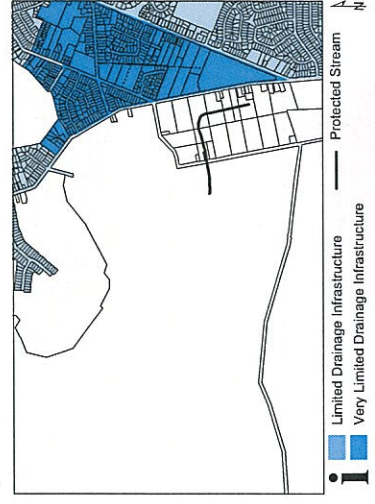
ID No:	Also on Map	Description	Address
89		House	65 Mountain Road, Mangere Bridge
85		House "The Oaks"	84 Wallace Road (known as 100 Wallace Road), Mangere Bridge
86		Topping House	164 Coronation Road, Mangere Bridge
		<b>Schedule 6B - Notable Trees and Stands of Trees</b>	
	5	1 x Elm 2 x Puriri 1 x Pohutukawa See diagram 1 in Appendix 3 of the Planning Maps	87 Wallace Road, Mangere Bridge
		<b>Schedule 6E - Geological Features and Areas</b>	
	5	Mangere Mountain Scoria Cone	17R Domain Road, Mangere Bridge
	11	Mangere Lagoon Explosion Crater	66 Wellesley Road, Mangere Bridge

### Heritage Resources to be Protected

ID No:	Also on Map	Description	Address
		<b>Schedule 6F - Waahi Tapu</b>	
6	5	Mangere Mountain	17R Domain Road, Mangere Bridge
10	5	Ambury Park Stonefields	66 Wellesley Road, Mangere Bridge
		<b>Schedule 6G - Archaeological Sites</b>	
7		Ambury Park Settlement	66 Wellesley Road, Mangere Bridge



**MANGERE BLANKET HEIGHT RESTRICTION ZONE:**  
The information on this map is prepared by the Auckland Regional Council and is intended to provide a general overview of the terms of protecting regionally significant sites (See 13.13.6.2.1 (G) (H) SOURCE: Auckland Regional Council Auckland Regional Policy Statement Map Series 4, Sheet 3



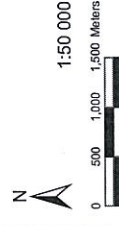


**Map Series 1:**  
**Auckland**  
**Regional Plan:**  
**Air, Land & Water**  
**Map 29**  
**West Auckland**  
**Waitakere**

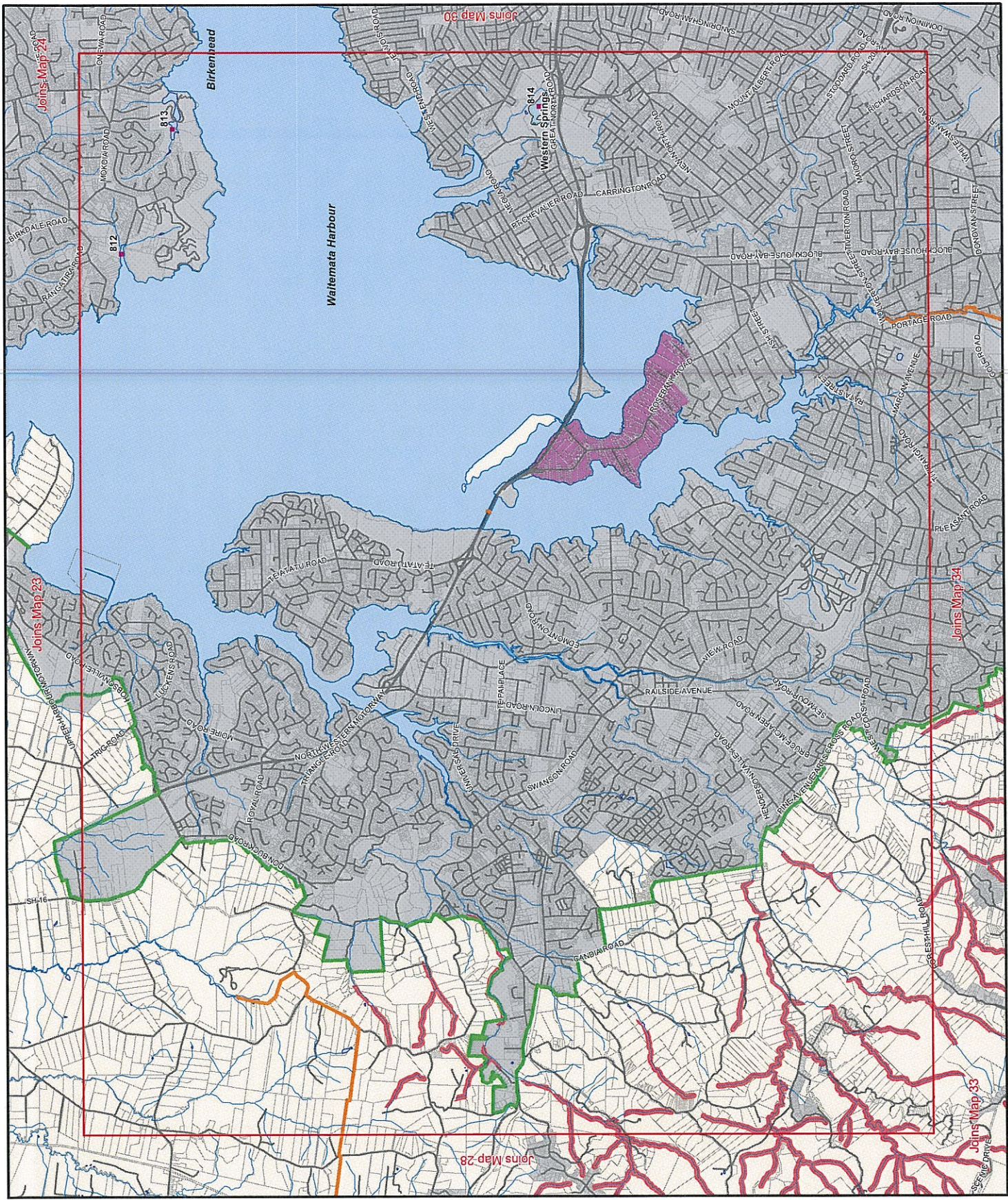
**LEGEND**

- Roads
- Land Parcel Boundary
- Local Authority Boundary
- Metropolitan Urban Limits
- River or Stream
- Lakes, Dams and Ponds
- Natural Lake Management Areas
- Urban Lake Management Areas
- Natural Stream Management Areas
- High Use Stream Management Areas
- Industrial Air Quality Management Areas
- Urban Air Quality Management Areas
- Rural Air Quality Management Areas

**Notes:**  
 Lines are indicative only, where there is any Natural Stream Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.  
 Lines are indicative only, where there is any Urban Lake Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.  
 Lines are indicative only, where there is any Natural Lake Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.  
 Lines are indicative only, where there is any High Use Stream Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.  
 Lines are indicative only, where there is any Industrial Air Quality Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.  
 Lines are indicative only, where there is any Urban Air Quality Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.  
 Lines are indicative only, where there is any Rural Air Quality Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.



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 ARC GIS Unit - 21 October 2010









# Map Series 1: Auckland Regional Plan: Air, Land & Water Map 35 Otahuhu Auckland

**LEGEND**

- Roads
- Land Parcel Boundary
- Local Authority Boundary
- Metropolitan Urban Limits
- River or Stream  
(Lines are shown as Topographical Maps) (Lines are indicative only of permanent rivers or streams, but may include water courses which are intermittent streams, or which are artificially created. In all cases, a permanent river or stream, shall be made with reference to the definition of "Permanent River or Stream" in Chapter 12, Definitions.
- Wetland Management Areas
- Lakes, Dams and Ponds
- Natural Lake Management Areas  
Management Area applies to the lake itself (not the lake shoreline (see Schedule 4))
- Urban Lake Management Areas
- Natural Stream Management Areas  
Lines are indicative only. Where there is any Natural Stream Management Area, it shall be determined by reference to the criteria in Section 3.4.2 of Chapter 3: Management Areas.
- High Use Stream Management Areas
- Industrial Air Quality Management Areas
- Urban Air Quality Management Areas
- Rural Air Quality Management Areas

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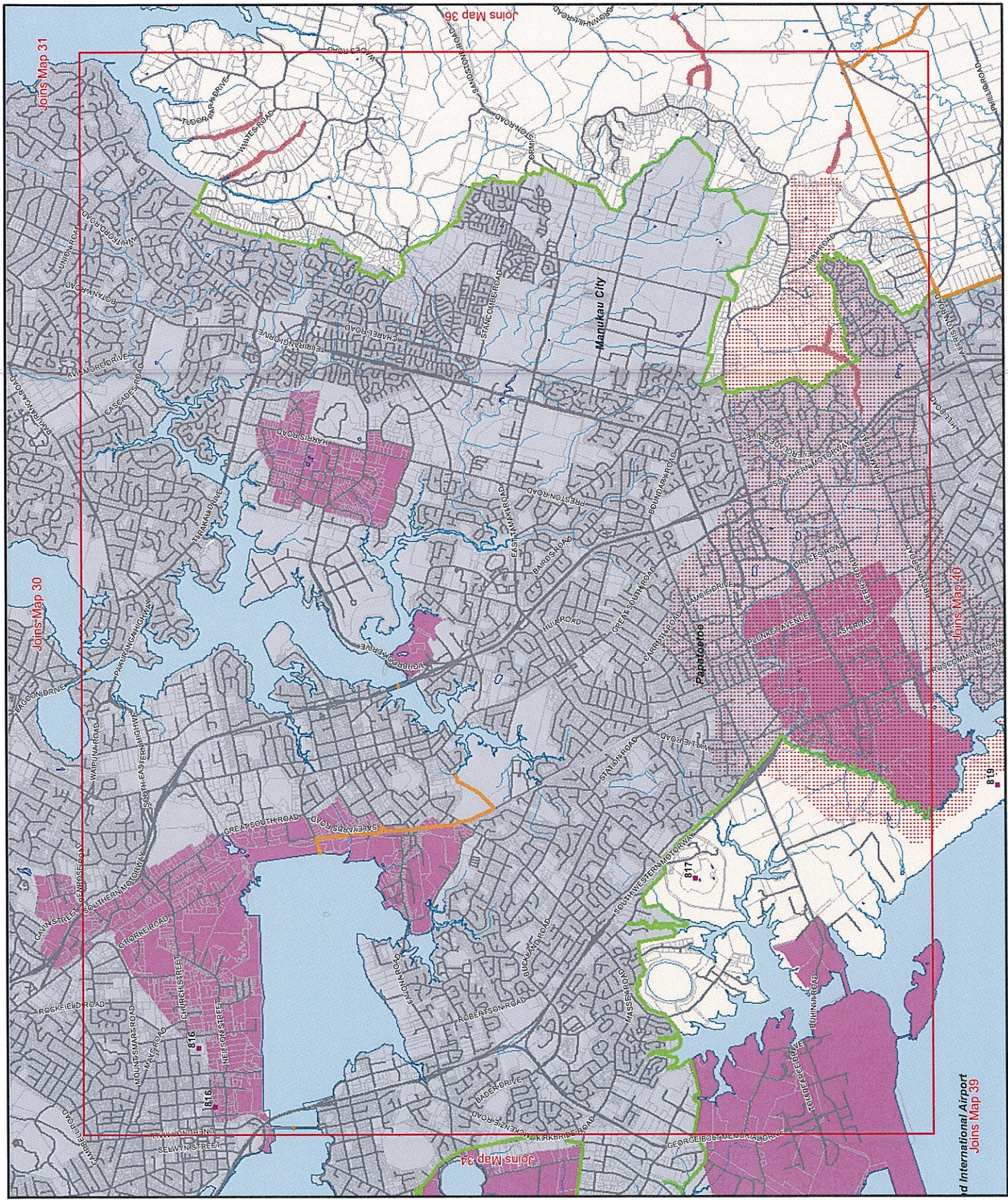
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ARC GIS Unit - 21 October 2010

Auckland Regional Council  
TE Kaitiaki Take Kōwhiri



Joins Map 31

Joins Map 30

Joins Map 36

International Airport  
Joins Map 39



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October 2004

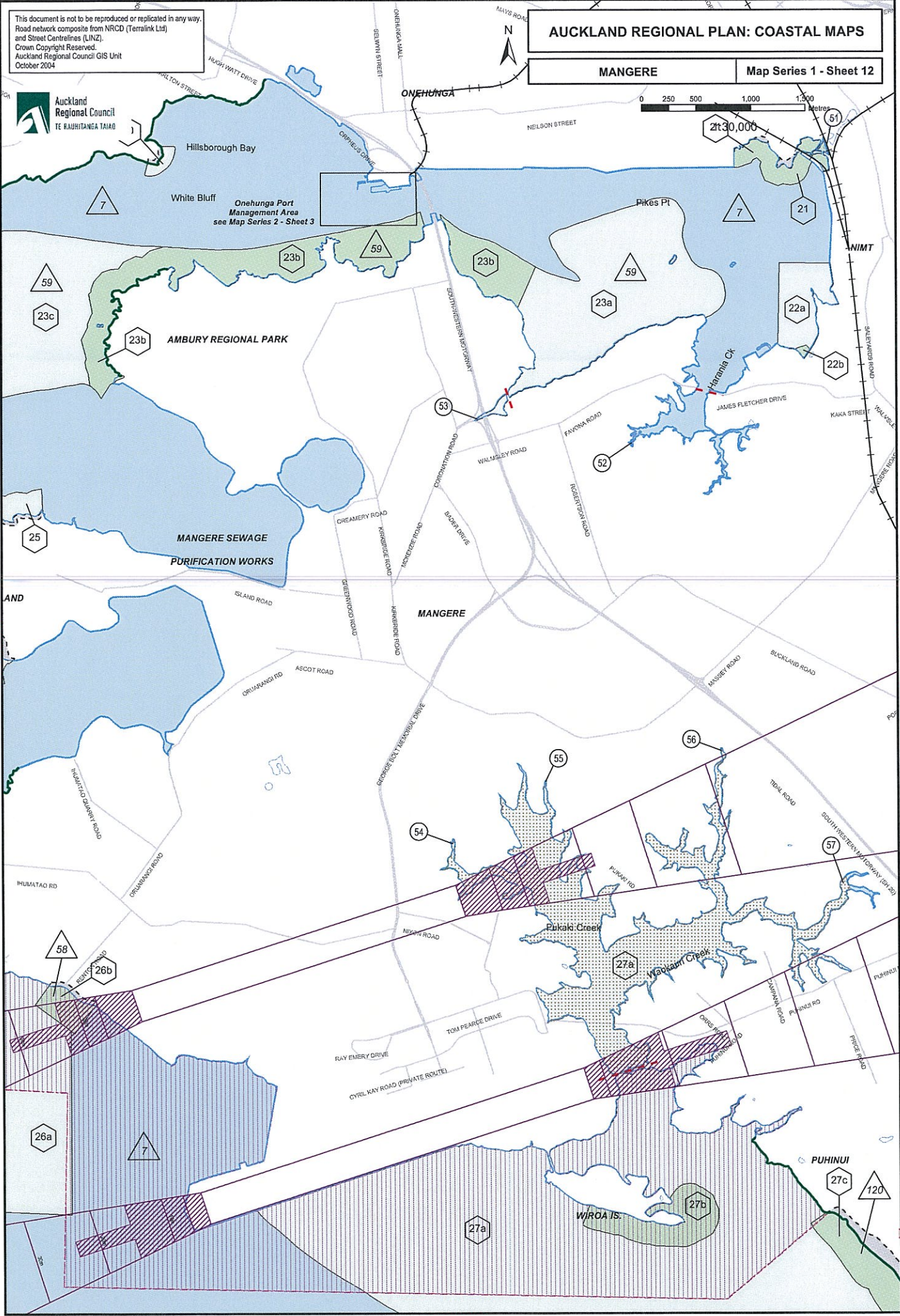
# AUCKLAND REGIONAL PLAN: COASTAL MAPS

MANGERE

Map Series 1 - Sheet 12



21:30,000



Joins Sheet 11































Joins Sheet 24

Joins Sheet 13

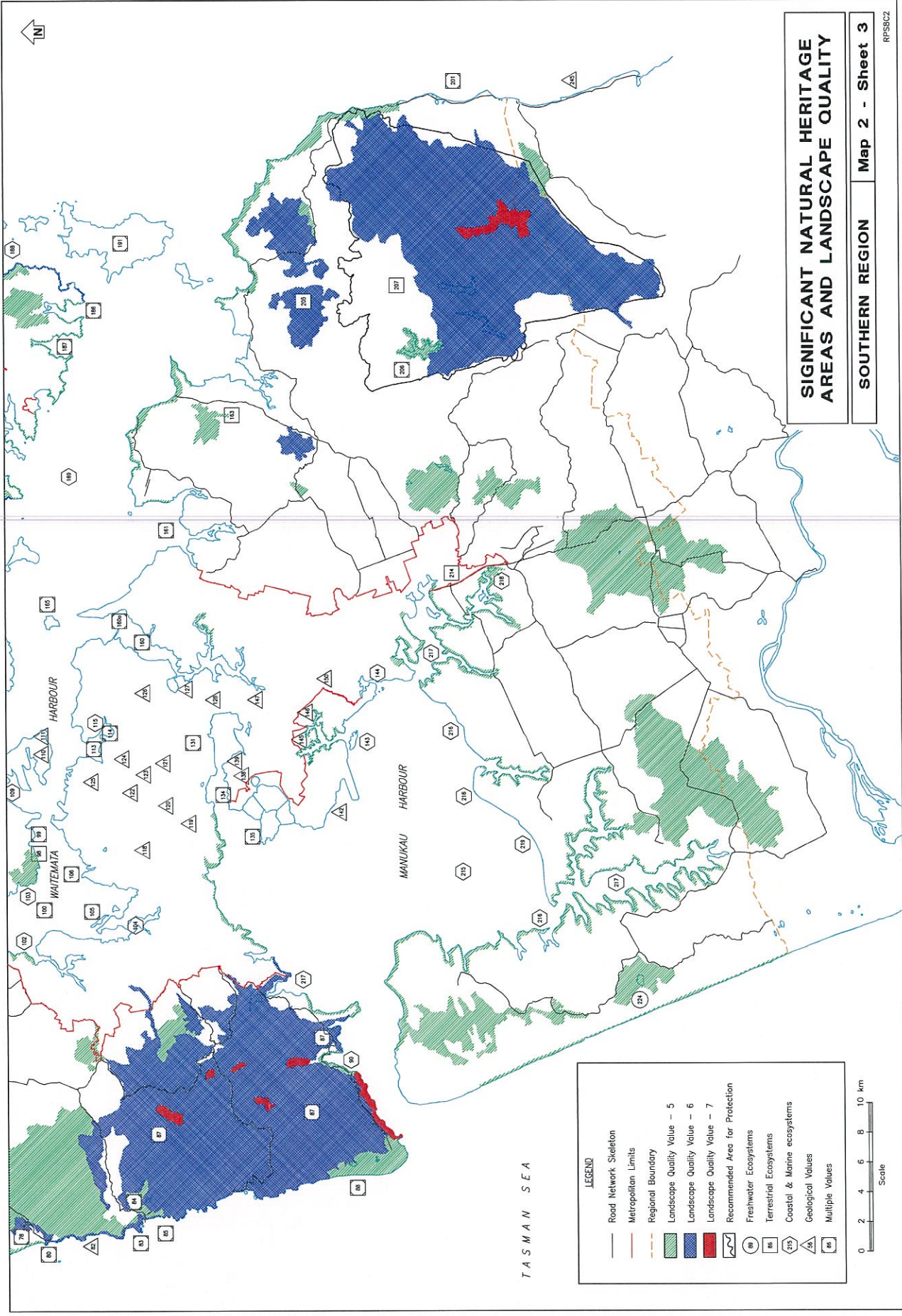


## AUCKLAND REGIONAL PLAN: COASTAL MAPS

### MAP SERIES 1 LEGEND

-  General Management Area
-  Tangata Whenua Management Area
-  Airport Management Area
-  Mooring Management Area (see Schedule 5)
-  Marina Management Area
-  Aquaculture Management Area (AMA) - (Variations 2, 4 - 6\*, see Schedule 9)
-  Land Associated with Coastal Protection Areas (CPA)
-  Coastal Protection Area (CPA) 1
-  Coastal Protection Area (CPA) 2
-  Coastal Protection Area 1 (small sites)
-  Coastal Protection Area number (see Schedule 3)
-  Cultural Heritage Places and Areas for Preservation (see Schedule 1)
-  Cultural Heritage Places and Areas for Protection (see Schedule 2)
-  Area of Significant Conservation Value (see Schedule 4)
-  Gazetted Marine Reserve
-  Marine Park
-  Regionally Significant Landscape (Rating 5)
-  Outstanding Landscape (Rating 6)
-  Outstanding Landscape (Rating 7)
-  Coastal Marine Area (CMA) boundaries (see Schedule 7)
-  Airport Height Restriction
-  Airport Runway Protection Area (see Appendix H)
-  Special Activity Area
-  Defence Exercise Area
-  Prohibited Anchorage
-  Main Trunk Rail
-  Motorway/State Highway
-  Major Road
-  Gas Line
-  Auckland Regional Council (ARC) Boundary

\* Variation 3 was withdrawn on 24 May 2006.



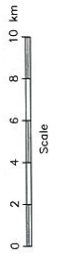
**SIGNIFICANT NATURAL HERITAGE  
AREAS AND LANDSCAPE QUALITY**

**SOUTHERN REGION      Map 2 - Sheet 3**

RPS8CZ

**LEGEND**

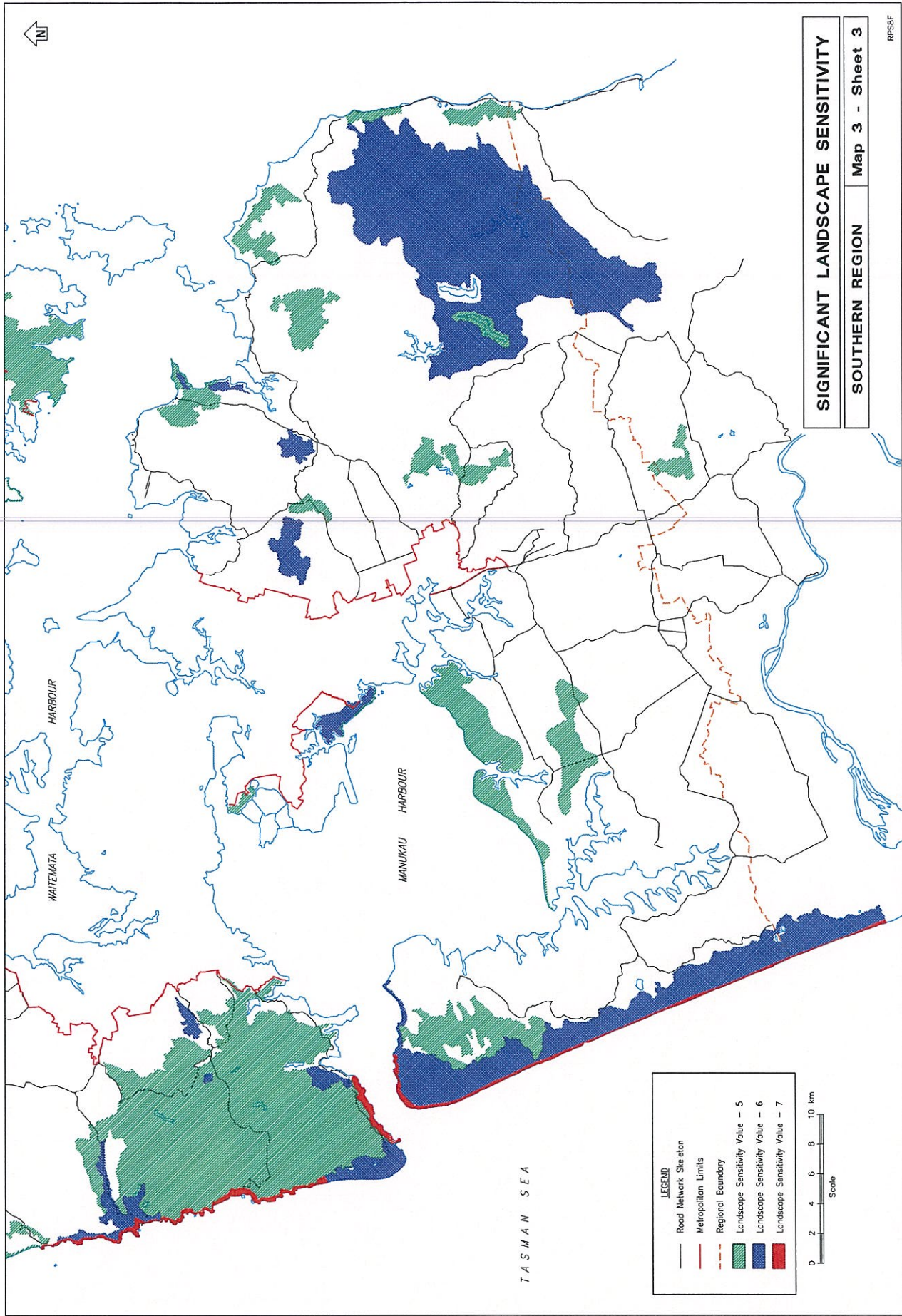
- Road Network Skeleton
- Metropolitan Limits
- Regional Boundary
- ▨ Landscape Quality Value - 5
- ▨ Landscape Quality Value - 6
- ▨ Landscape Quality Value - 7
- ▨ Recommended Area for Protection
- ⊕ Freshwater Ecosystems
- ⊕ Terrestrial Ecosystems
- ⊕ Coastal & Marine ecosystems
- ⊕ Geological Values
- ⊕ Multiple Values



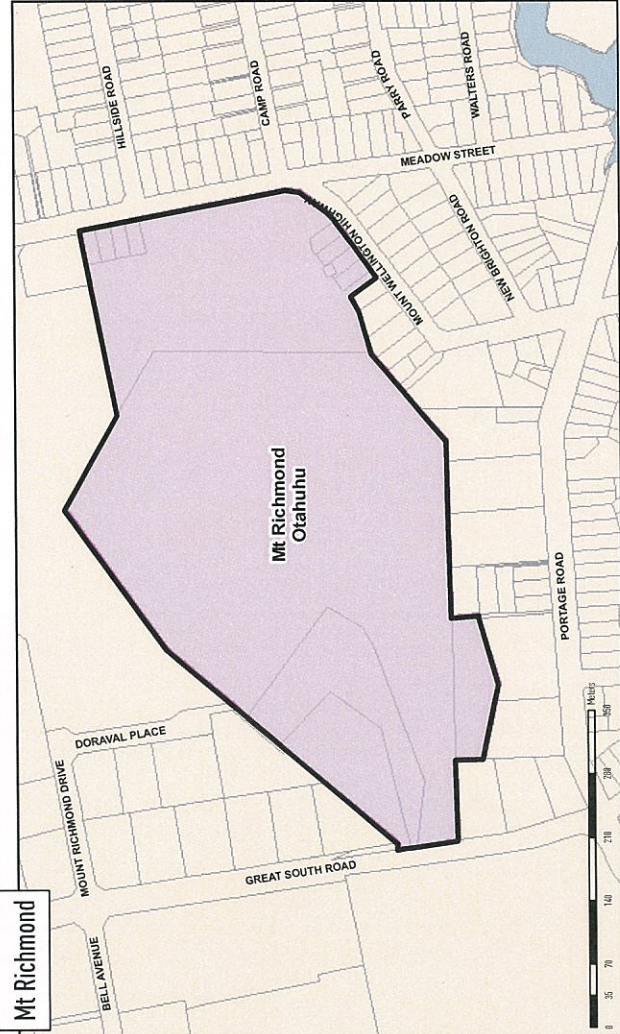
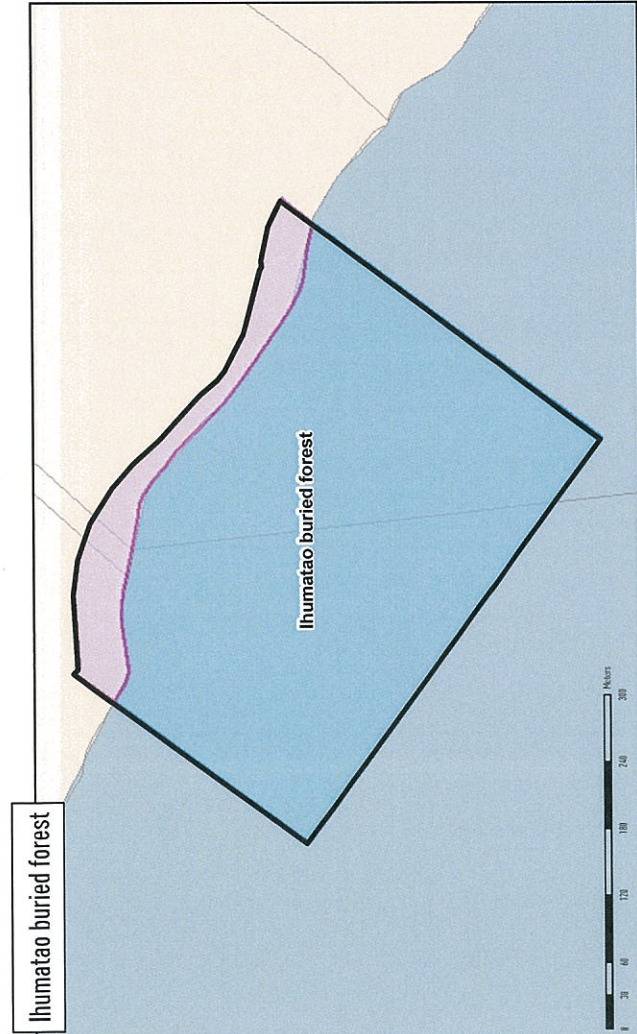
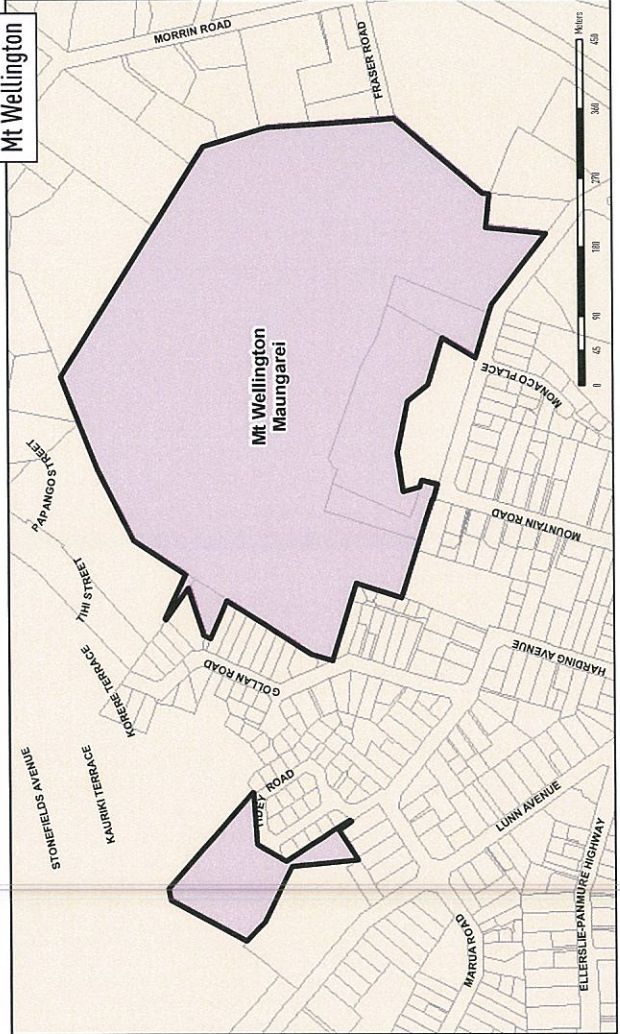
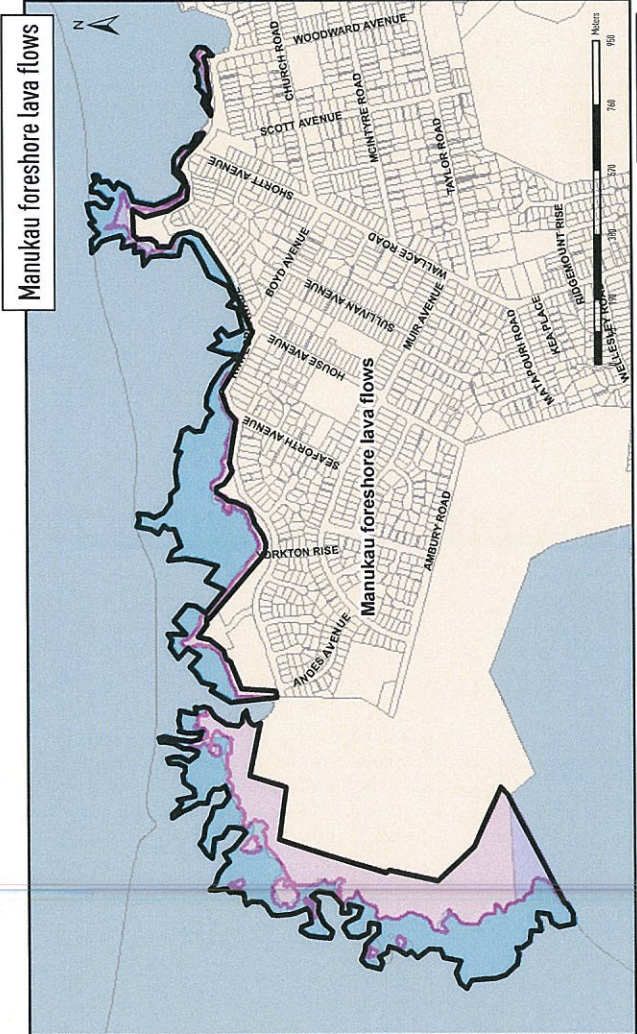
TASMAN SEA





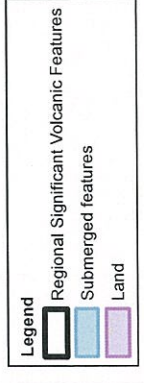




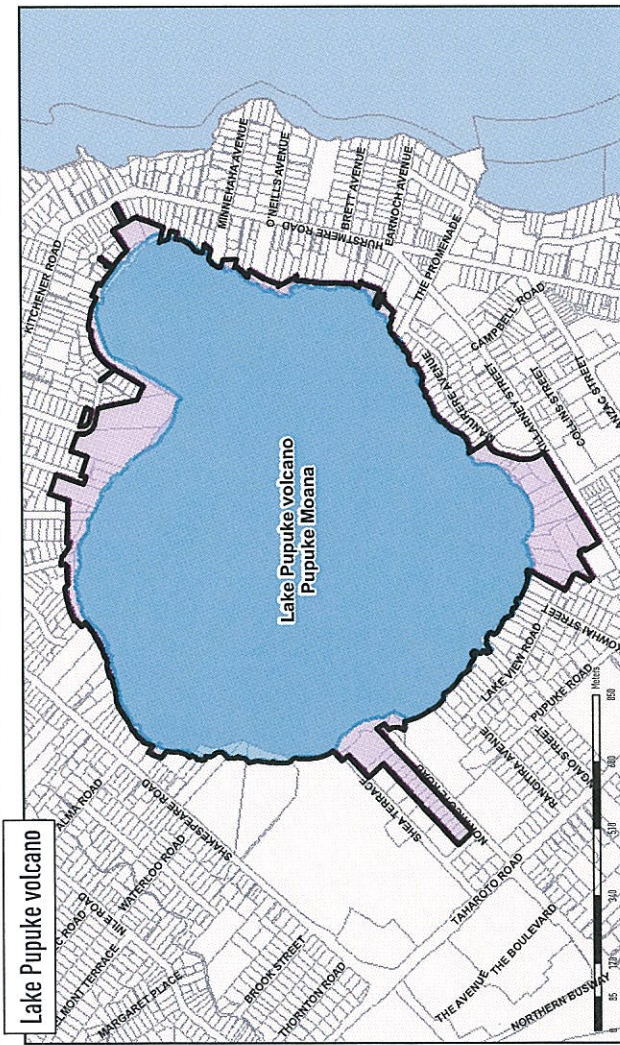
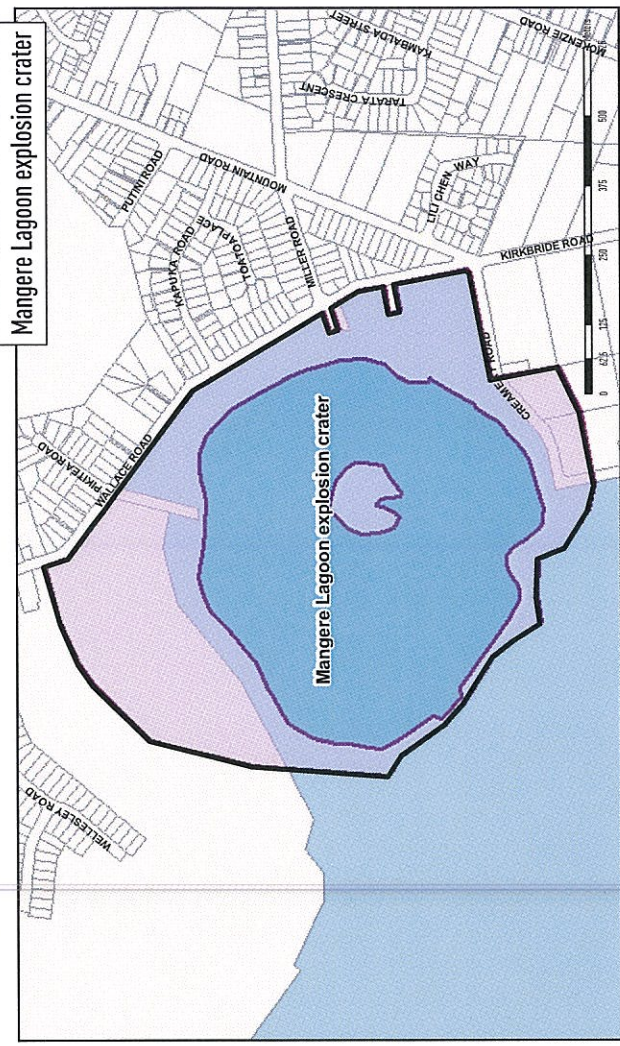
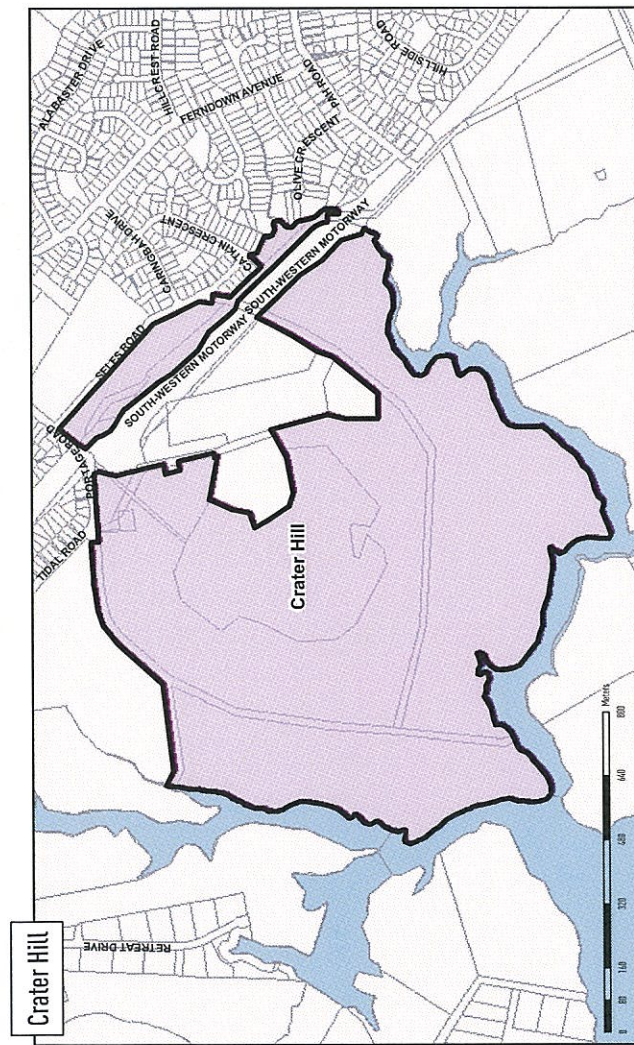
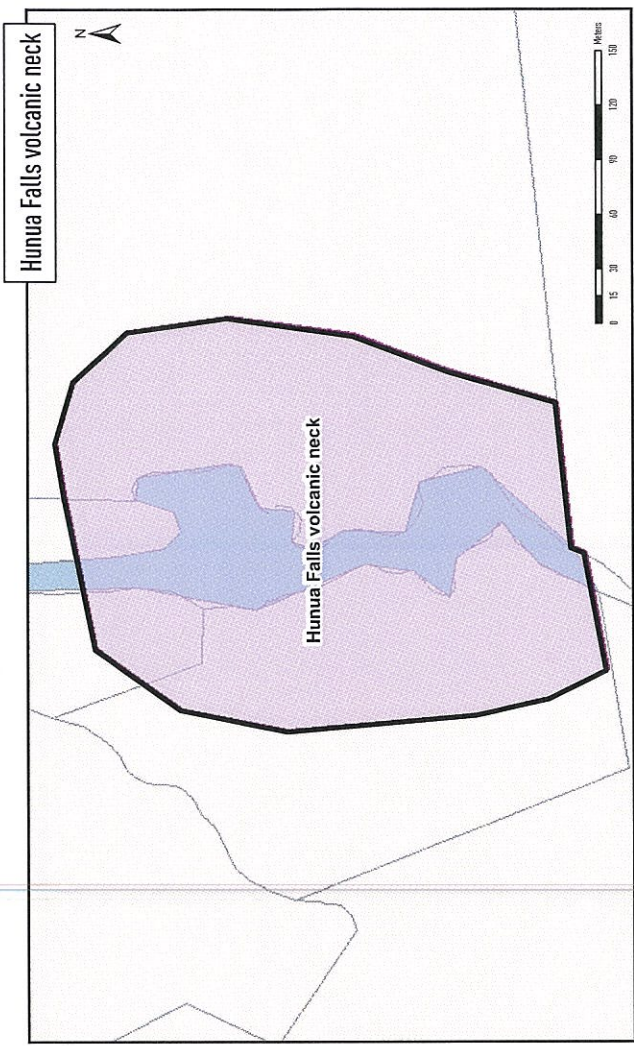


**REGIONALLY SIGNIFICANT VOLCANIC FEATURES**  
**Map Series 2a Sheet 1**

These maps do not show the full extent of the volcanic features described in Appendix B







## REGIONALLY SIGNIFICANT VOLCANIC FEATURES

### Map Series 2a Sheet 4

These maps do not show the full extent of the volcanic features described in Appendix B

**Legend**

- Regional Significant Volcanic Features
- Submerged features
- Land