



Whenuapai Wastewater Servicing Scheme Package 2 – Massey Connector and Northern Interceptor Phase 2

Assessment of Effects on the Environment

Prepared for Watercare Services Ltd
Prepared by Beca Limited



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Glossary of Terms and Acronyms

Term	Description
AEE	Assessment of effects on the environment.
Auckland Transport (AT)	A council-controlled organisation responsible for transport projects and services.
AUP:OP	Auckland Unitary Plan: Operative in Part
bgl	Below ground level
BMP	Bat Management Plan
CCO	Council controlled organisation
CHI	Cultural Heritage Inventory
CNVA	Construction Noise and Vibration Assessment
CNVMP	Construction Noise and Vibration Management Plan
CSMP	Contaminated Site Management Plan
DSI	Detailed Site Investigation
EcIA	Ecological Impact Assessment
ESCP	Erosion Sediment Control Plan
GD05	Erosion & Sediment Control Guide.
GSMCP	Groundwater and Settlement Monitoring and Contingency Plan
HAIL	Hazardous Activities and Industries List. A list established by Ministry for the Environment, of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal.
LAeq	Equivalent continuous noise level
NESCS	Resource Management (National Environmental Standard for Assessment and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NES:FW	National Environmental Statement for Freshwater
NPS:FM	National Policy Statement for Freshwater Management
Package 2 – Massey Connector and Northern Interceptor Phase 2 (the Project)	Two gravity main pipelines and a gravity connection pipeline conveying wastewater flows from the Whenuapai and Redhills catchments to the Hobsonville pump station
TBM	Tunnel Boring Machine
Whenuapai Wastewater Servicing Scheme	The scheme has been developed to deliver the necessary wastewater infrastructure network in Whenuapai and Redhills using a staged approach, with infrastructure delivered in three different packages to respond to growth and necessity as demand increases across the area.
Watercare Services Limited (Watercare)	A council-controlled organisation responsible for providing water and wastewater services across the Auckland Region.
WWTP	Wastewater treatment plant

Executive Summary

The North West region of Auckland, including the Whenuapai and Redhills catchments, are expected to experience significant urban development over the next 30 years. In response to this growth, Watercare Services Limited (Watercare) has developed the Whenuapai Wastewater Servicing Scheme, which will deliver necessary wastewater infrastructure in a staged manner, as growth and development necessitates.

This Project, which includes the Massey Connector and phase 2 of the Northern Interceptor, is referred to as the Whenuapai Wastewater Servicing Scheme – Package 2 Project.

The Project will deliver the necessary wastewater infrastructure network to unlock land within the Whenuapai and Redhills catchments, and the wider North West region of Auckland for development, and includes:

- A break pressure chamber at 8 Spedding Road, Whenuapai;
- A gravity main pipeline between the break pressure chamber and 27 Trig Road (the Massey Connector);
- A gravity main pipeline from 27 Trig Road to the 2 Buckley Road (the Northern Interceptor);
- A gravity connection pipeline from 2 Buckley Road to the existing Hobsonville pump station at 2A Buckley Road (the Hobsonville pump station connection); and
- 5 permanent manholes (3 along the Northern Interceptor and 2 along the Hobsonville pump station connection).

The Northern Interceptor section of the Project (with the exception of a portion of an access road) is located within Designation 9377 (Northern Interceptor Shared Corridor) held by Watercare, whilst the break pressure chamber is located within a Notice of Requirement lodged by Watercare. An Outline Plan of Works will be prepared and submitted in accordance with these designation requirements prior to construction.

This Assessment of Effects on the Environment (AEE) report, therefore, has been prepared to support resource consents for regional matters across the Project, and for any district planning requirements where the infrastructure is outside of the existing designation or Notice of Requirement. The proposed pipelines will be generally constructed by trenchless methods, albeit that a section of the Hobsonville pump station connection will be installed by open trenching. Nine shafts will be constructed along the alignment to provide access for construction activities. Construction laydown areas will be located at each shaft site. Once construction is complete, six of the shafts will be converted to permanent structures, and the remainder will be disestablished.

Key construction activities will include earthworks to excavate the shafts and prepare the construction laydown areas, dewatering of excavations, and vegetation removal, including from the riparian yard of streams and riverine wetlands. To minimise and manage potential effects during construction, a range of measures have been proposed including replacement planting of protected vegetation removed, and the implementation of a Groundwater and Settlement Monitoring and Contingency Plan (GSMCP), an Erosion and Sediment Control Plan (ESCP), a Construction Noise and Vibration Management Plan (CNVMP), and a Contaminated Site Management Plan (CSMP) during construction. Ecological surveys will also be undertaken, and if native fauna are confirmed to be present at the sites, a Lizard Management Plan (LMP) and/or Bat Management Plan (BMP) will be prepared and implemented.

An assessment of the relevant objectives and policies of the relevant statutory and non-statutory documents has been undertaken, which demonstrates that the Project is generally consistent with the relevant objectives and policies, and the purposes and principles of the RMA.

Overall, there will be some permanent and temporary adverse effects during the construction of the Project. Mitigation measures have been proposed to avoid, minimise or reduce these effects. Once the Project is in place, it will have significant benefits associated with increasing the wastewater servicing capacity for the Whenuapai and Redhills catchments, responding to growth and development.

1 Introduction

This Assessment of Effects on the Environment report (AEE) has been prepared by Beca Limited (Beca) on behalf of Watercare Services Limited (Watercare) (the Applicant) to support an application for resource consent to construct the proposed Whenuapai Wastewater Servicing Scheme – Package 2 Project (the Project). The Project comprises the Massey Connector and the Northern Interceptor Phase 2/ Stage 1 pipelines (location shown on Figure 1-1), and includes a new break pressure chamber, two new gravity main pipelines, a gravity connector pipeline, and associated infrastructure.

Specifically, resource consent is sought for a **Discretionary Activity** under the Auckland Unitary Plan: Operative in Part (AUP: OP) and National Environmental Standard for Freshwater (NES F). This AEE has been prepared pursuant to Section 88 of the Resource Management Act 1991 (RMA), and in accordance with the Fourth Schedule.

1.1 Watercare Services Ltd

Watercare is New Zealand's largest water and wastewater utility provider, responsible for the planning, maintenance, and operation of water and wastewater services to communities throughout Auckland and the northern Waikato regions. Watercare has supplied wholesale water supply and wastewater services since 1991 and is a Council Controlled Organisation (CCO), wholly owned by the Auckland Council.

As a lifeline utility, Watercare's services are vital for life, ensuring the safety and wellbeing of communities and helping them to flourish. Watercare's key services are:

- the collection, treatment, and distribution of drinking water from various dams, rivers and groundwater sources;
- the collection, treatment, and disposal of wastewater at various wastewater treatment plants;
- the transfer, treatment, and disposal of trade wastes; and
- the provision of commercial laboratory services.

Watercare is responsible for the management of over 410 million litres of wastewater daily, which is collected, treated, and disposed of in environmentally responsible ways. The wastewater network operated by Watercare consists of over 8,000 kilometres of pipes and 518 pump stations, directing wastewater to 18 treatment plants throughout the region.

Watercare is continually reviewing its activities and identifying maintenance, replacement, upgrading and new infrastructure projects to ensure it meets customer's needs, business objectives and statutory requirements. New infrastructure is frequently required across the region to cater for Auckland's growing population, to upgrade its assets, and to improve the security of its services.

Over the coming 20 years, Auckland's population is expected to grow by 29%, adding another 476,000 people to the current population of 1.7 million. To build a resilient water and wastewater system for this growing population, and ensure reliability of service, Watercare will invest about \$18.5 billion in renewing and upgrading critical assets over the next 20 years.

1.2 Project Background

1.2.1 Northern Interceptor Context

Watercare operates two main wastewater treatment plants which service metropolitan Auckland, including the Mangere Wastewater Treatment Plant (WWTP) located at Mangere in South Auckland, and Rosedale WWTP located in Albany on the North Shore. Wastewater from the North West region of Auckland, (including Whenuapai, Redhills, Hobsonville, Massey and Swanson, Kumeu, Huapai and Riverhead) is

currently conveyed to the Mangere WWTP, whilst wastewater from the North Shore is conveyed to the Rosedale WWTP.

The North West region of Auckland is expected to experience significant growth over the next 30 years. Subsequent to the local government amalgamation in 2010, Watercare identified the strategic opportunity to construct a pipeline (the Northern Interceptor) to divert wastewater from the North West region of Auckland to Rosedale WWTP. When completed, the Northern Interceptor will run from the Concourse storage tank in Henderson in the west, to Rosedale WWTP in the north, providing servicing capacity for the anticipated growth in the North West region and freeing up capacity at the Mangere WWTP to receive increasing flows from future growth in Central, East and South Auckland (refer to Figure 1-1).

Watercare designated the Northern Interceptor alignment (Designation 9377 (Northern Interceptor Shared Corridor)) in 2016, with the intention of constructing the pipeline in a staged manner depending on the rate of population growth within each contributing catchment. Phase 1 of the Northern Interceptor, which is between Hobsonville Pump Station and the Rosedale WWTP, is currently under construction with an expected completion date of October 2023. Phase 2 (stage 1) of the Northern Interceptor runs between 27 Trig Road, Whenuapai, and the Hobsonville Pump Station, is located within designation 9377, and is the subject of this application.

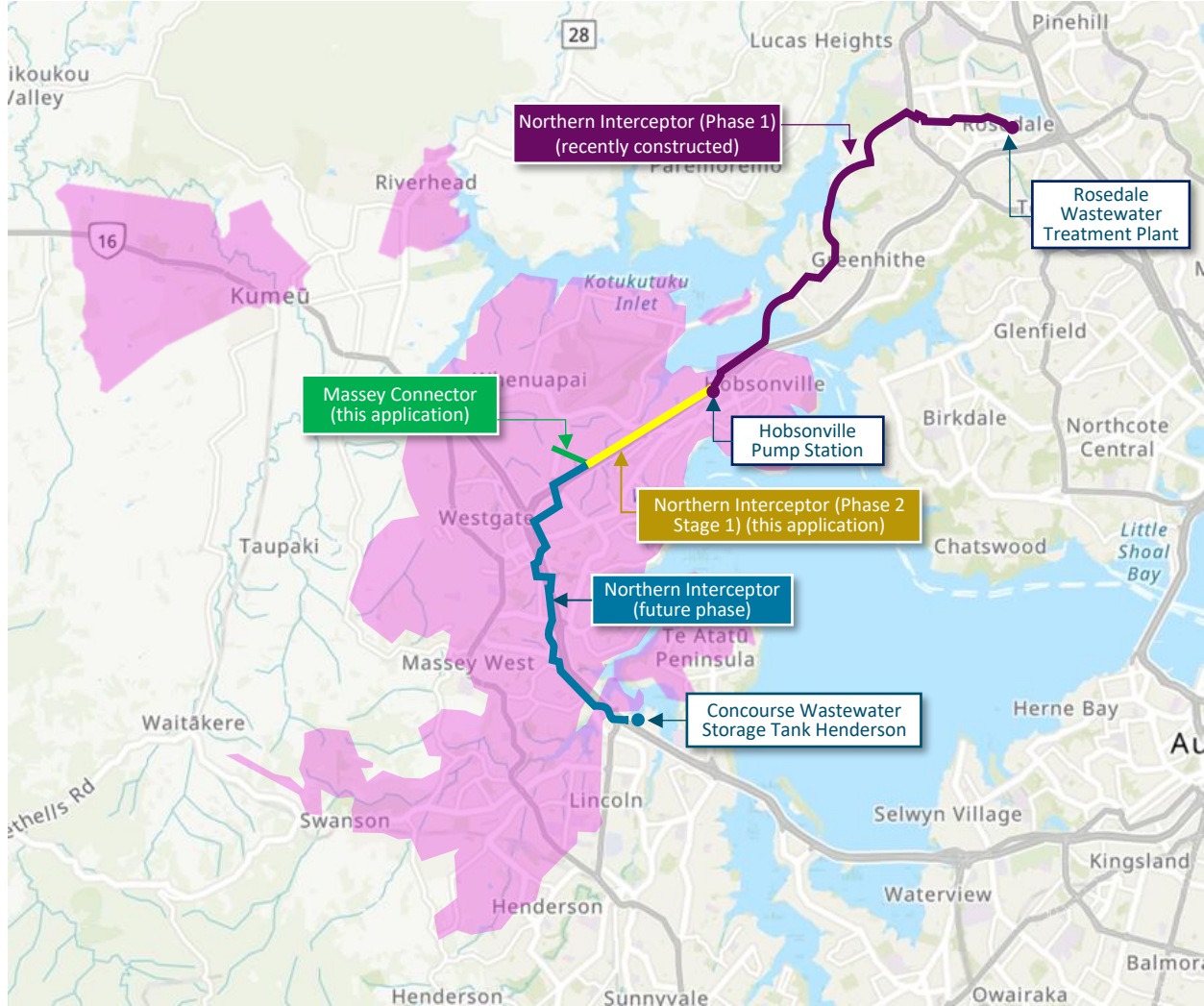


Figure 1-1. Northern Interceptor and Massey Connector (including recently constructed Phase 1 Project), with service catchment of the Northern Interceptor shaded in pink.

1.2.2 Whenuapai – Redhills Wastewater Servicing Scheme

Whenuapai and Redhills catchments within the North West region are currently undergoing rapid urbanisation, including the rezoning of a 60 hectare block of land between Spedding Road and Brigham Creek Road from Future Urban to Business – Light Industry in January 2023. In the context of this planned growth, Watercare has identified that additional wastewater servicing capacity is required in order to service the Whenuapai and Redhills catchments and unlock the land for development. The Whenuapai-Redhills Wastewater Servicing Scheme (the Scheme) has been developed to deliver the necessary wastewater infrastructure network in Whenuapai and Redhills (refer to Figure 1-2). The Scheme uses a staged approach, with infrastructure delivered in three different packages to respond to growth and necessity as demand increases across the area.

- Package 1: Pump station with gravity main and rising main servicing the Whenuapai catchment
- Package 2: Two gravity main pipelines conveying wastewater flows from the Whenuapai and Redhills catchments to the Hobsonville pump station
- Package 3: Four gravity pipelines servicing the Southern Redhills area

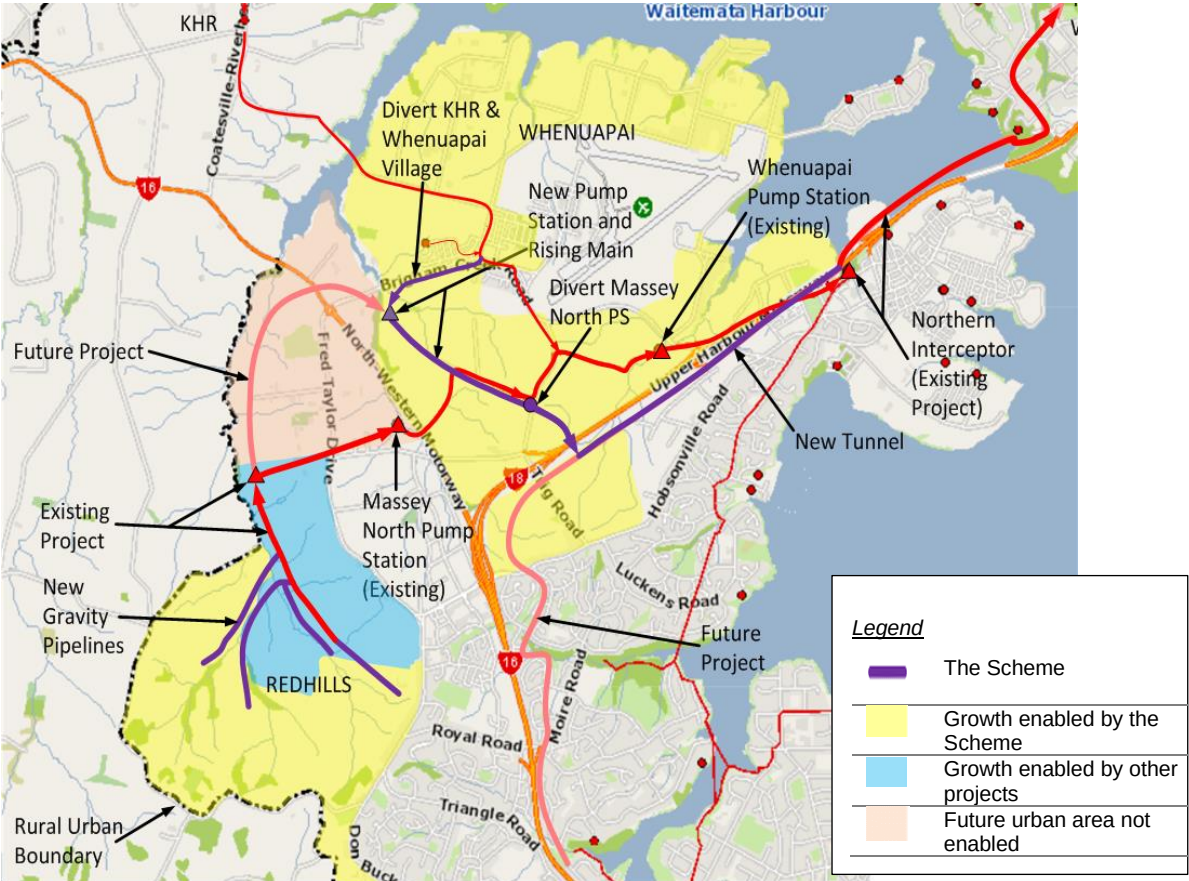


Figure 1-2. Whenuapai – Redhills Wastewater Servicing Scheme (the Scheme) (Source: Watercare)

1.3 Whenuapai Wastewater Servicing Scheme – Package 2 (The Project)

The subject of this application is “Package 2”, which includes the Massey Connector and the Phase 2 / Stage 1 of the Northern Interceptor (the Project) (refer to Figure 1-3).

The Massey Connector will receive wastewater from the Whenuapai and (in future) Redhills catchments beginning at a break pressure chamber proposed to be constructed at 8 Spedding Road, and convey the wastewater through to the Northern Interceptor at 27 Trig Road. This section of the Northern Interceptor will receive wastewater from the Massey Connector, and catchments further west and south as the staged

buildout progresses. The wastewater will be conveyed through to the Hobsonville Pump Station then onto the Rosedale WWTP.

The Project includes the following five key components:

1. A **break pressure chamber** located on the corner of Mamari and Spedding Roads which connects to the Package 1 works¹.
2. The **Massey Connector**, a gravity pipeline (approximately 1km long and 2100mm in diameter) between the break pressure chamber and the Northern Interceptor at 27 Trig Road, Whenuapai.
3. Phase 2 / Stage 1 of the **Northern Interceptor**, comprising of a new gravity tunnel (approximately 2.8km long and 2100mm in diameter), which will run adjacent to the Upper Harbour Highway between 27 Trig Road, Whenuapai, and 2 Buckley Avenue, Hobsonville.
4. A **pump station connection** (approximately 40 m in length, and 800 mm in diameter), between the Northern Interceptor and the Hobsonville Pump Station
5. **Five permanent shafts** along the Northern Interceptor alignment and pump station connection.

It is proposed to construct the Massey Connector and Northern Interceptor by trenchless methods using a Tunnel Boring Machine (TBM). Temporary works to install the pipeline will include construction of three additional shafts to launch or receive the TBM (in addition to the five permanent shafts and Break Pressure Chamber), construction yards/laydown areas to support each shaft site, and a temporary access road. The alignment of the Northern Interceptor, pump station connection, all shaft sites and construction yards, and the majority of the access road are located within Designation 9377, which is for the purpose of constructing and operating the Northern Interceptor.

The proposed works are described in detail in Section 3 of this AEE, and the design drawings are provided in Appendix A.

¹ The location of the break pressure chamber has been influenced by the alignment of Package 1 works (a Notice of Requirement has been lodged to designate the alignment for Package 1) . Detailed design for the break pressure chamber has been completed as part of 'Package 2' and therefore regional resource consents are sought as part of this consenting package. An Outline Plan will be prepared for the break pressure chamber, separate to this application, once the designation is confirmed in accordance with s176a of the RMA and at least 20 working days prior to construction.

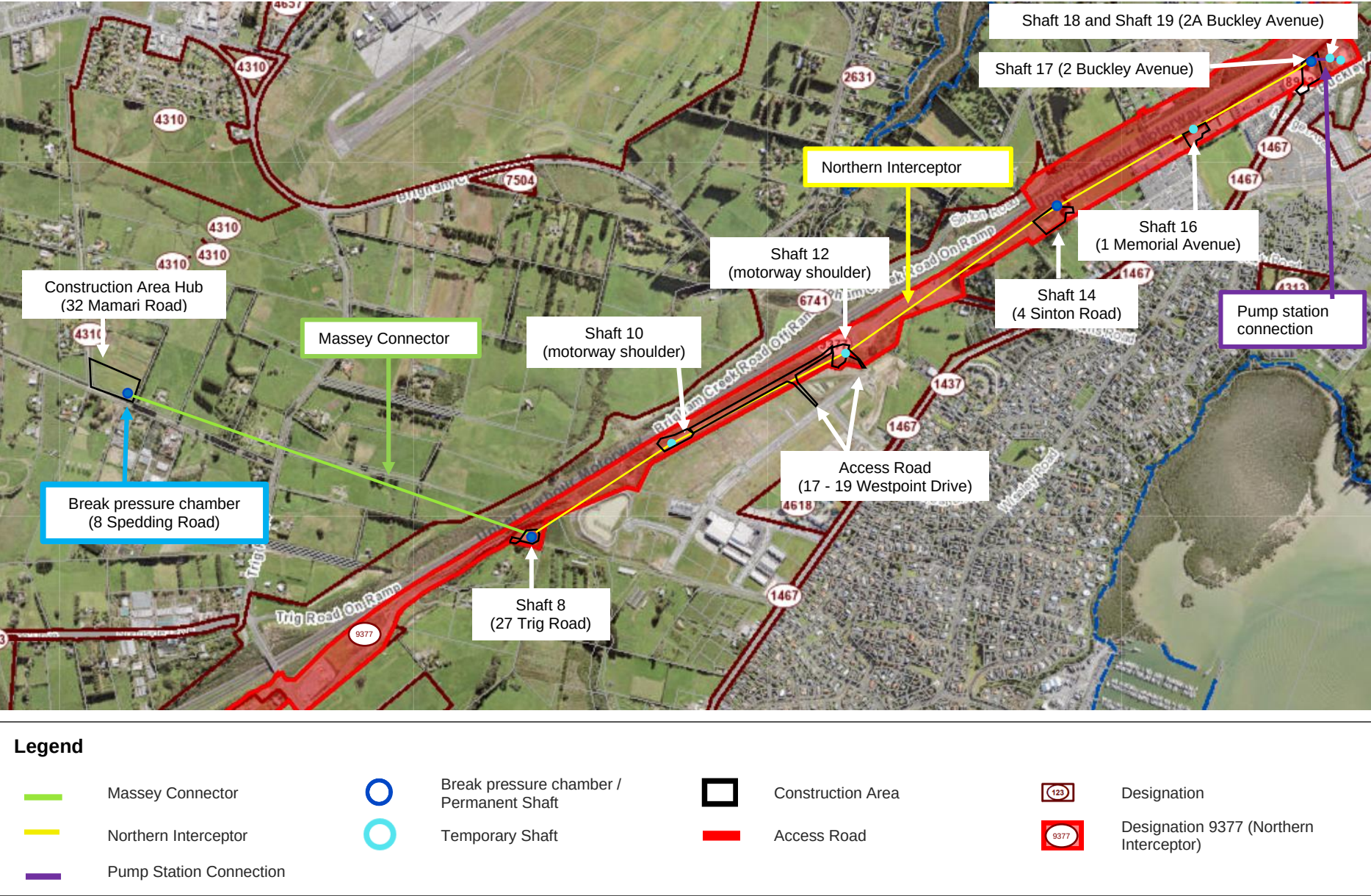


Figure 1-3. Overview of works for Package 2, including key components and ancillary works.

1.4 Summary of resource consents sought

Resource consent is required for a **Discretionary Activity** under the AUP:OP and National Environmental Standards : Freshwater (NES:F), pursuant to Section 9 and 14 of the RMA for the following activities (outlined in further detail in Section 4 of this AEE report):

Regional Planning Matters

- Dewatering of groundwater not complying with standards (AUP:OP Rule E7.4.1(A20))(**Restricted Discretionary Activity**), for dewatering which occurs for greater than 30 days during construction of shafts.
- Vegetation alteration and removal from the riparian area (AUP:OP Rule E26.3.3.1(A77))(**Restricted Discretionary Activity**). Up to 2,300 m² of vegetation will be removed from the riparian area at Shaft 8, whilst approximately 150 m² of vegetation will be removed from the riparian area at Shaft 12.
- Earthworks which exceed 2,500 m² in the Sediment Protection Area and on land with a slope exceeding 10 per cent (AUP:OP Rule (E26.5.3.1 (A106) and (A107))(**Restricted Discretionary Activity**). Approximately 9,800 m² earthworks are required to construct the access road, construction laydown areas and shafts at Shafts 10 and 12.
- Discharges of contaminants (AUP:OP Rule E30.4.1(A7))(**Discretionary Activity**), for soil disturbance of greater than 200 m³ over a period of greater than 2 months at 3 HAIL sites where no soil sampling has been undertaken.
- Soil disturbance of a HAIL site where no soil sampling has been undertaken (NESCS Regulation 10)(**Discretionary Activity**), for soil disturbance of 3 HAIL sites where no soil sampling has been undertaken.
- Construction of specified infrastructure in proximity to a wetland (NES:F Regulation 45(1) and (2)) (**Discretionary Activity**), for approximately 540 m² of vegetation clearance and earthworks within 10 m of a natural wetland for the purpose of constructing specified infrastructure.

District Planning Matters outside Designation 9377

- Activities which exceed permitted activity standards for construction vibration (AUP:OP Rule E25.4.1(A2))(**Restricted Discretionary Activity**) for potential exceedance of the night time vibration amenity limit at 2 properties during construction of the Massey Connector pipeline which are outside of Designation 9377.
- Removal of any tree greater than 4 m in height from the open space zone (AUP:OP Rule E26.4.3.1(A92))(**Restricted Discretionary Activity**) for removal of 1 tree greater than 4 m in height at 19 Westpoint Drive to construct the access road to Shafts 10 and 12. 19 Westpoint Drive is located outside of Designation 9377.
- Earthworks which exceed 2,500 m² and 2,500 m³ (AUP:OP Rule E26.5.3.1(A97)(A97A))(**Restricted Discretionary Activity**). Approximately 10,000 m² and 450 m³ of earthworks are required to construct the break pressure chamber and associated construction laydown area at 8 Spedding Road and 32 Mamari Road, which are located outside of Designation 9377. In addition, of the 9,800 m² and 6,000 m³ earthworks required to construct Shafts 10 and 12 and the associated access road, approximately 400 m² and less than 2,500 m³ of earthworks will be at 19 Westpoint Drive which is outside of Designation 9377.
- Specific temporary activities that are not provided for as a permitted activity (AUP:OP Rule E40.4.1(A24))(**Restricted Discretionary Activity**). The construction laydown area at the break pressure chamber, and vehicle access at 19 Westpoint Drive (which are outside of the designation) will be in place for a period of approximately 36 months, which exceeds the temporary activity threshold of 24 months.

Activities within Designation 9377

The Northern Interceptor and Shafts 8 - 19 are located within Designation 9377. An Outline Plan will be submitted prior to construction commencing in accordance with Section 176A of the RMA.

1.5 Report structure

This report contains the following information:

- A description of the existing environment;
- A description of the proposed activities;
- An assessment of the potential and actual effects on the environment of the activity and the proposed mitigation measures;
- Engagement and consultation undertaken for the project;
- Notification assessment
- An assessment of the proposed activities against matters set out in Part 2 of the RMA; and
- The statutory framework relevant to the assessment of effects.

2 Existing Environment

2.1 Landuse

The proposed Massey Connector will run through predominantly agricultural, and rural residential land in Whenuapai, whilst the Northern Interceptor will run alongside the Upper Harbour Highway in rapidly urbanising land between Whenuapai and Hobsonville.

Property information for the project shaft sites, construction laydown areas and access road is provided in Table 2-1, and an overview of the underlying zonings, overlays and designations for each site is provided in Sections 2.1.1 to 2.1.6. Property information for properties underneath the pipeline alignment are provided in Table 2-2. Records of Title are provided in Appendix M.

The Northern Interceptor is located within Designation 9377 – Northern Interceptor Shared Corridor, held by Watercare, and Designation 6741 – State Highway 16 and 18 – Westgate to Whenuapai and Hobsonville, held by Waka Kotahi. Designation 6741 was in place prior to Designation 9377, and therefore takes primacy. In addition, Designation 4311 for Defence purposes – protection of approach and departure paths (Whenuapai Air Base), held by the Minister of Defence, covers the works area.

More specific detail on the existing landuse at each individual shaft location is provided Sections 2.1.1 to 2.1.6 (refer to Figure 1-3 for an overview of all the locations).

Information in relation to existing hydrological features including wetlands has been taken from the Ecological Impact Assessment (EcIA) for the project prepared by Beca provided in Appendix C.

Table 2-1. Property information for shaft sites, construction laydown areas and access roads

Site	Address	Legal description	Property ownership
Break pressure chamber	8 Spedding Road	SECT 1 SO 582220	Watercare
	32 Mamari Road	SECT 2 SO 582220	Privately owned and partially leased by Watercare
Shaft 8	27 Trig Road	SEC 28 SO 447691	Watercare
	Upper Harbour Highway	Road	Waka Kotahi
Shaft 10 – 12 and access road	19 Westpoint Drive	Lot 41 DP 502477	Auckland Council
	18 Westpoint Drive	Lot 901 DP 502477	Brigham Creek Business Park Limited
	Upper Harbour Highway	Road	Waka Kotahi
Shaft 14	4 Sinton Road	SECT 1 SO 548679	Watercare
	Upper Harbour Highway	Road	Waka Kotahi
Shaft 16	1 Memorial Park Lane	PT Allot 523 SO 40181 Waipareira	Auckland Council
	Upper Harbour Highway	Road	Waka Kotahi
Shaft 17	2 Buckley Avenue	Lot 50 DP 523085	Watercare
	Upper Harbour Highway	Road	Waka Kotahi
Shaft 18, 19	2A Buckley Avenue	SEC 1 SO 419259	Watercare

Table 2-2. Property information for properties underneath the tunnel alignment

Pipeline	Address	Legal description	Property ownership
Massey Connector	6 Spedding Road	LOT 18 DP 62344	Privately owned
	4 Spedding Road	LOT 17 DP 62344	Privately owned

Northern Interceptor	92 Trig Road	LOT 16 DP 62344	Auckland Council
	Trig Road	Road reserve	Auckland Transport
	53 Trig Road Whenuapai	SEC 56 SO 447691	Privately owned
	51 Trig Road	SEC 31 SO 447691	Privately owned
	49 Trig Road	LOT 6 DP 62344	Privately owned
	Upper Harbour Highway	Road	Waka Kotahi
	Hobsonville Road	LOT 101 DP 475543, LOT 100 DP 475543	Privately owned
	174 Brigham Creek Road	SEC 32 SO 444423	Privately owned
	2 Falcon Crescent	LOT 5 DP 505331	Privately owned
	33 Carder Court	LOT 47 DP 487569	Privately owned
	31 Carder Court	LOT 48 DP 487569	Privately owned
	29 Carder Court	LOT 49 DP 487569	Privately owned
	27 Carder Court	LOT 50 DP 487569	Privately owned
	25 Carder Court	LOT 51 DP 487569	Privately owned
	23 Carder Court	LOT 52 DP 487569	Privately owned
	21 Carder Court	LOT 53 DP 487569	Privately owned
	19 Carder Court	LOT 54 DP 487569	Privately owned
	17 Carder Court	LOT 55 DP 487569	Privately owned
	15 Carder Court	LOT 56 DP 487569	Privately owned
	13 Carder Court	LOT 39 DP 487569	Privately owned
	Carder Court	LOT 104 DP 487569	Privately owned
	44 Memorial Park Lane	LOT 40 DP 487569	Privately owned

Table 2-3. Relevant AUP notations across the project area.

AUP notation	Works location
Zones	
Future Urban	Break pressure chamber, Shaft 8,
Open Space – Informal Recreation	Shaft 10 – 12 access road at 19 Westpoint Drive
Business – Light Industry	Shaft 10 – 12 access road at 18 Westpoint Drive
Designations	
Designation 4311, Defence purposes - protection of approach and departure paths (Whenuapai Air Base), Minister of Defence	Break pressure chamber
Notice of Requirement, Whenuapai & Redhills Wastewater Scheme, Watercare	Break pressure chamber
Notice of Requirement, Spedding Road Upgrade - Auckland Transport	Break pressure chamber, Shaft 8
Designation 9377, Northern Interceptor Shared Corridor, Watercare	Shafts 8 – 19, access road (excepting 18 and 19 Westpoint Drive)
Designation 6741, State Highway 16 and 18 – Westgate to Whenuapai and Hobsonville, Waka Kotahi	

2.1.1 Break pressure chamber site

The break pressure chamber will be located at 8 Spedding Road which is outside of Designation 9377. The associated construction laydown area for the site will be located at the adjacent site at 32 Mamari Road, and will also act as a contractor area hub for the remainder of the works areas (refer to Figure 2-1 below). The land is relatively flat agricultural paddock which has previously been utilised for horticultural purposes but is now fallow, with vegetation made up of predominantly exotic grasses and rushes. Properties which are adjacent to the site contain rural residential dwellings.

Both 8 Spedding Road and 32 Mamari Road are zoned Future Urban in the AUP:OP. Several Notice of Requirements are located across the site, including for the Whenuapai and Redhills Wastewater Scheme, which includes the break pressure chamber (lodged by Watercare), and for the Spedding Road Upgrade (lodged by Auckland Transport). The Notice of Requirement for the Whenuapai and Redhills Wastewater Scheme was in place prior to the Notice of Requirement for the Spedding Road Upgrade, and therefore takes primacy. In addition, 8 Spedding Road and 32 Mamari Road are subject to specific protection measures under Designation 4311, with land use subject to New Zealand Defence Force approval.

Freshwater features

A natural wetland is located within a slight topographical depression approximately 30 m north of the break pressure chamber construction yard area at 32 Mamari Road (see Figure 2-1). The wetland is ephemeral, being likely to completely dry out in the summer months. Vegetation is predominantly creeping buttercup (*Ranunculus repens*) and soft rush. The wetland area is highly modified and degraded, with limited suitable habitat for fauna, and was assessed in the EclA to have low current ecological value.

Terrestrial fauna

Whilst there are no records of native lizards present either at or within 1km of the site, the long grasses at the site provide suitable habitat for copper and ornate skinks, which have a conservation status of 'At Risk'. The ecological value of this site of lizards is therefore assessed as high.

Bats have been recorded within 1 km of the break pressure chamber site within the last 3 years, and trees along the boundary of the site provide potential bat roosting habitat. As long tailed bats have been previously located in proximity to the site, and there is some suitable habitat present, the ecological value of the site for bats is assessed to be high.

Birds recorded in proximity to the site in the last 10 years include only commonly found native avifauna with a conservation status of 'Not Threatened', and exotic species. Due to the presence of only Not Threatened and exotic avifauna within proximity to the site and limited habitat availability, the ecological value of the site for birds is assessed to be low.

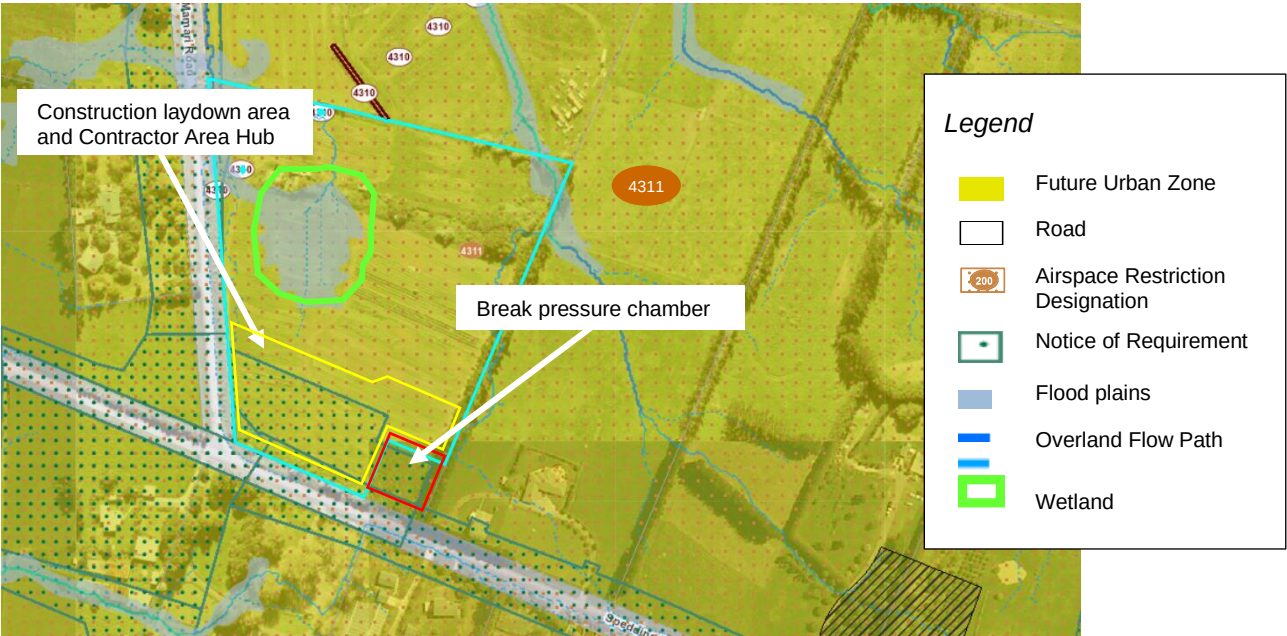


Figure 2-1. Break pressure chamber (8 Spedding Road outlined in red, 32 Mamari Road outlined in aqua).

2.1.2 Shaft 8

Shaft 8 will be located at 27 Trig Road, Whenuapai, which is accessed via an existing sealed road off Trig Road (refer to Figure 2-2 below). The western and central section of the site is relatively flat, whilst the eastern section of the site dips downwards. The edges of the site fall away relatively steeply towards the streams and riverine wetlands which flank the northern and eastern borders of the works area.

The site is zoned Future Urban, whilst the access way is zoned Strategic Transport Corridor Zone. The site is located within Designation 9377, whilst the access way is located within both Designation 9377 and Designation 6741 (primary designation). A section of the site is also subject to a Notice of Requirement for the Spedding Road Upgrade.

The site contains thick native vegetation (kānuka, mānuka and karamū) either side of the accessway, and sparse juvenile native vegetation (coprosma) which has self seeded along the eastern boundary. Nevertheless, vegetation at the site is dominated by exotic grasses, scrub, and pest plants including gorse and pampas. Mature exotic and pest trees are located along the southern boundary of the site and within the riparian area of the stream (refer to the Arboricultural Assessment in Appendix B for further details).

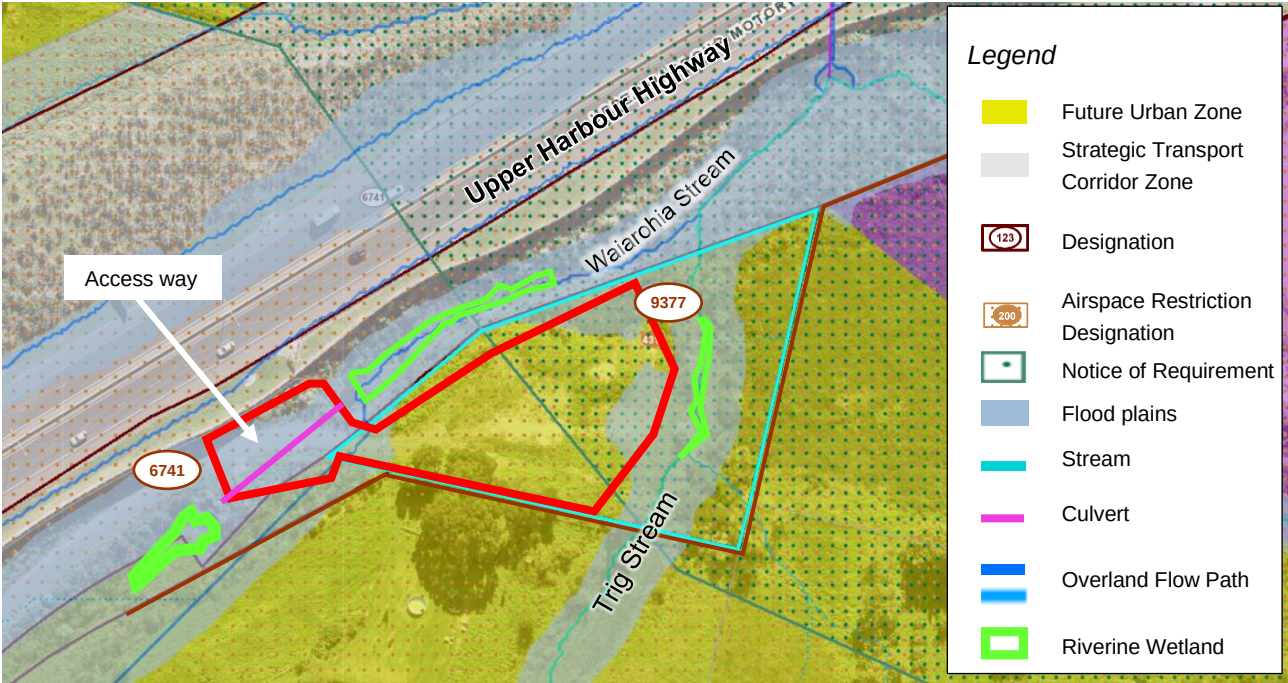


Figure 2-2. Shaft 8 works area location (outlined in red), and relevant zones, designations, and hydrological features applicable to the site under the AUP:OP.

Freshwater features

The Shaft 8 site at 27 Trig Road is bordered by Waiarohia Stream and Trig Stream (see Figure 2-2), two permanent headwater streams which join together to the north of the site and then discharge to the Waiarohia Inlet approximately 1.4 km north east of the works area.

Waiarohia Stream flows from west to east along the north western boundary. The stream contains habitats ranging from deeper pools (10-15cm) to shallow runs (5-10cm), and has a sandy silt bottom. The stream passes through an existing culvert underneath the site accessway. The stream channel at the entrance and exit to the culvert is overgrown with the aggressive pest species reed sweet grass (*Glyceria maxima*), which forms a riverine wetland which extends approximately 60 m along the site boundary. Riparian vegetation along the channel length comprises of a mix of native, exotic and pest species which provides limited stream shading due to the low stature of the vegetation.

Trig Stream flows from south to north along the eastern boundary. The stream is naturally meandering with a minimum water depth of approximately 30 cm, with some areas of deeper pools. Instream habitat includes pool and run features, and undercut banks. An approximately 30 m section of the Trig Stream channel also contains a reed sweet grass (*Glyceria maxima*) riverine wetland.

Both streams have a moderate rating for ecological context as they are headwater streams and key inanga spawning sites have been identified downstream of the site. However, the streams have been degraded below that typically associated with rural land uses in Auckland, with moderate to poor water quality and low ratings assigned for representativeness, rarity/distinctiveness, and diversity and pattern. The wetlands were assessed to provide minimal ecosystem services. Overall, the streams and riverine wetlands were assessed as having low ecological value.

Terrestrial fauna

Whilst there are no records of native lizards present either at or within 1km of the site, the vegetation at the site provides suitable habitat for copper and ornate skinks, which have a conservation status of 'At Risk'. The ecological value of this site of lizards is therefore assessed as high.

There are no records of bats in proximity to Shaft 8. However, the trees at the site may provide some (albeit minimal) suitable bat roosting habitat. As long tailed bats have a home range of 100 km and there are some suitable habitats present within the site, the ecological value of the site for bats is assessed to be high.

Birds recorded in proximity to the site in the last 10 years include only commonly found native avifauna with a conservation status of 'Not Threatened', and exotic species. The works are situated in close proximity to the Upper Harbour Highway which is likely to result in continuous disturbance and noise to birds in the area. Due to the presence of only Not Threatened and exotic avifauna within proximity to the site and limited habitat availability, the ecological value of the site for birds is assessed to be low.

2.1.3 Shafts 10 and 12

Shafts 10 and 12 will be located within the shoulder of Upper Harbour Highway and within Designations 9377 and 6741 (Designation 6741 has primacy). The temporary accessway to the site will be constructed through 18 and 19 Westpoint Drive, partially outside of Designation 9377 and within Open Space and Business – Light Industry zone (refer to Figure 2-3 below).

The Shaft 10 works area is relatively flat, whilst the Shaft 12 works area slopes gently down to the west at an angle of approximately 17 degrees. 19 Westpoint Drive contains a constructed stormwater wetland, whilst 18 Westpoint Drive is currently undeveloped land.

Vegetation at Shafts 10 and along the access road is made up of grass and mixed native plants planted approximately 10 to 12 years ago as part of motorway construction, whilst the Shaft 12 site contains short grass.

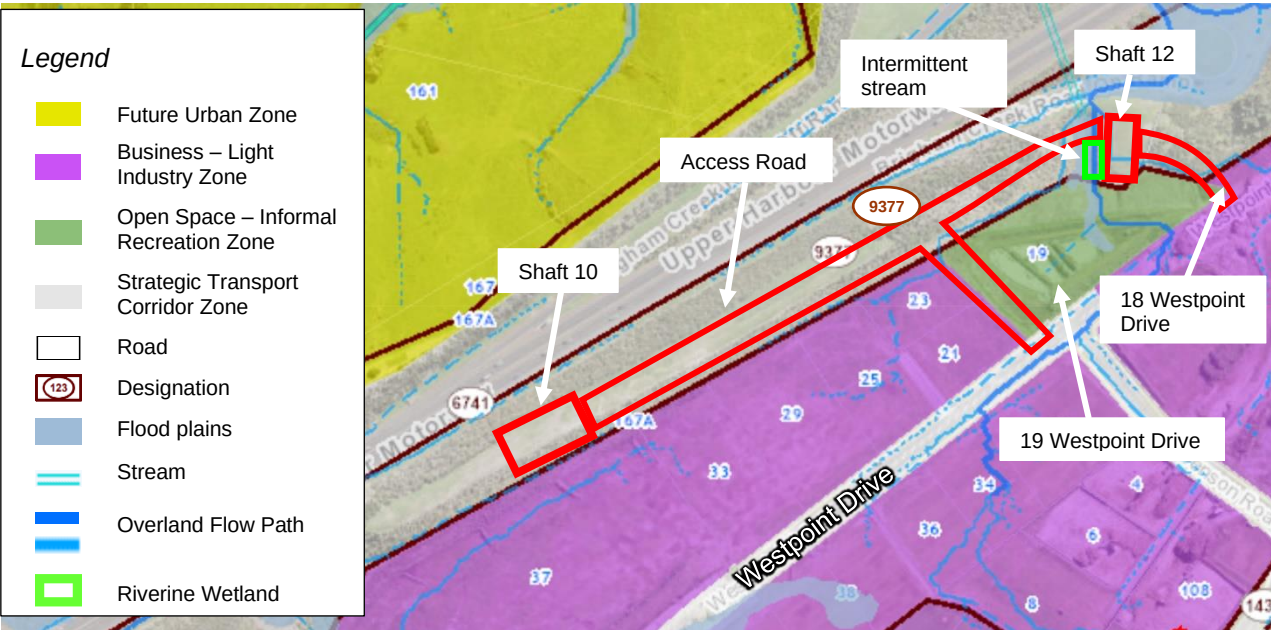


Figure 2-3. Shaft 10, Shaft 12, and access road works area location (outlined in red), and relevant zones, designations, and hydrological features applicable to the site under the AUP:OP

Freshwater features

An intermittent stream is located in the motorway shoulder along the western side of Shaft 12 (see Figure 2-3). A large stormwater pond is located south of the watercourse, which may discharge into or within proximity to the watercourse, whilst the stream joins Waiarohia Stream approximately 300 m north of the works area.

The stream channel contains areas of deeper pools and is overgrown with vegetation, including umbrella sedge (*Cyperus ustulatus*), pampas, and *Coprosma sp.*, which form a riverine wetland within and along the

margins of the stream. Vegetation in the greater riparian area of the stream and wetland includes thick native vegetation and juvenile trees planted as part of motorway planting, which provide limited shading to the stream due to their current short stature. The base of the stream is expected to be soft sediment.

The stream is expected to provide some suitable habitat for tolerant macroinvertebrate species, however limited habitat to a range of native fish due to both the overgrowth of vegetation and the large culvert, which may be a barrier to fish passage. The wetland provides minimal ecosystem services. The ecological value of the stream and wetland are therefore assessed as low.

Terrestrial fauna

Whilst there are no records of native lizards present either at or within 1km of the site, the vegetation at the site provides suitable habitat for copper and ornate skinks, which have a conservation status of ‘At Risk’. The ecological value of this site of lizards is therefore assessed as high.

Whilst there are no records of bats in proximity to Shafts 10 and 12, trees at the site may provide some (albeit minimal) suitable bat roosting habitat. As long tailed bats have a home range of 100 km, and there are some suitable habitats present within and within proximity to the site, the ecological value of the site for bats is assessed to be high.

Birds recorded in proximity to the site in the last 10 years include only commonly found native avifauna with a conservation status of ‘Not Threatened’, and exotic species. The works are situated in close proximity to the Upper Harbour Highway, which is likely to result in continuous disturbance and noise to birds in the area. Nevertheless, the constructed stormwater wetlands near Shaft 12 may provide some habitat for waterfowl and wetland bird species. Due to the presence of only Not Threatened and exotic avifauna within proximity to the site, the ecological value of the site for birds is assessed to be low.

2.1.4 Shaft 14

Shaft 14 will be located at an undeveloped flat site within the motorway shoulder at 4 Sinton Road (refer to Figure 2-4 below). This site is zoned Strategic Transport Corridor Zone, and is completely within Designations 9377 and 6741 (Designation 6741 has primacy).

The area to the east contains newly developed residential housing, whilst land immediately to the south is currently undeveloped. Vegetation at the site is comprised of gorse and scrub, and long exotic grasses.

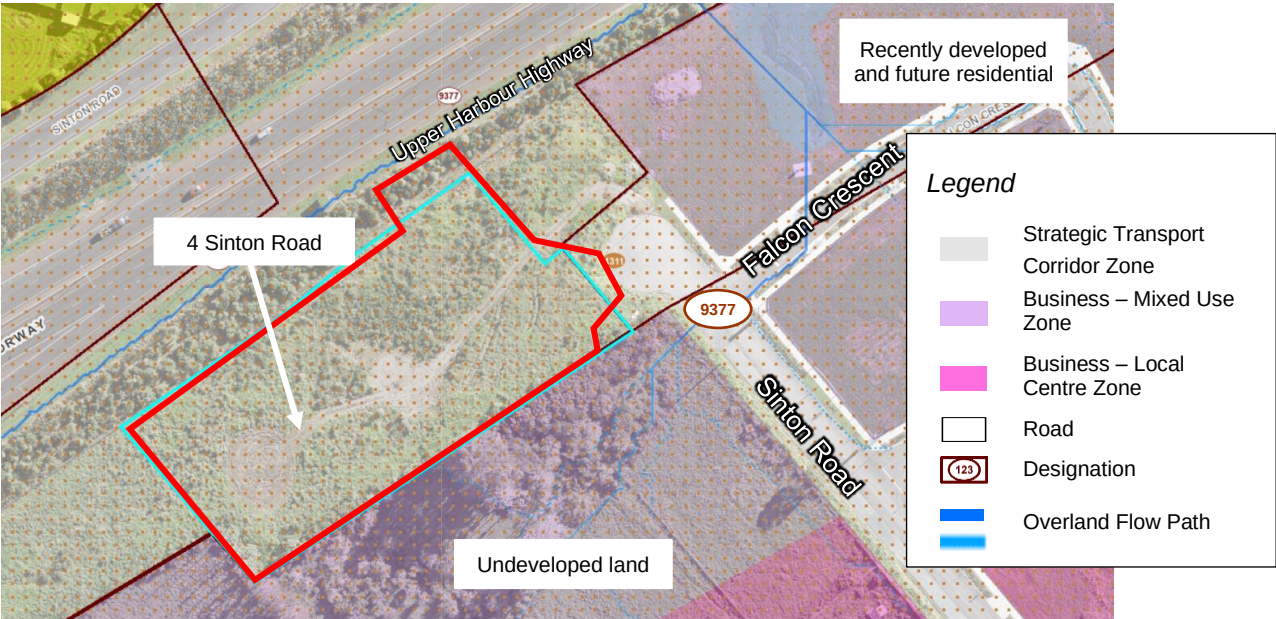


Figure 2-4. Shaft 14 works area location (outlined in red), and relevant zones, overlays, and designations applicable to the site under the AUP:OP.

Terrestrial fauna

Whilst there are no records of native lizards present either at or within 1km of the site, the long grasses at the site provide suitable habitat for copper and ornate skinks, which have a conservation status of ‘At Risk’. The ecological value of this site of lizards is therefore assessed as high.

Whilst there are no records of bats in proximity to Shaft 14, trees at the site may provide some (albeit minimal) suitable bat roosting habitat. As long tailed bats have a home range of 100 km, and there are some suitable habitats present within and within proximity to the site, the ecological value of the site for bats is assessed to be high.

Birds recorded in proximity to the site in the last 10 years include only commonly found native avifauna with a conservation status of ‘Not Threatened’, and exotic species. The works are situated in close proximity to the Upper Harbour Highway, which is likely to result in continuous disturbance and noise to birds at the site. Due to the presence of only Not Threatened and exotic avifauna within proximity to the site, the ecological value of the site for birds is assessed to be low.

2.1.5 Shaft 16

Shaft 16 will be located at 1 Memorial Park Lane, and in the motorway shoulder adjacent to 1 Memorial Avenue, Hobsonville (refer to Figure 2-5 below). The site contains the Hobsonville Bowling Club and associated car park, and the Hobsonville War Memorial Park. Residential housing is located to the east and west of the works area. Vegetation at the site is limited to mown grass, and native landscape planting alongside the motorway shoulder.

The site is zoned Open Space – Sport and Active Recreation Zone, and is located within Designation 9377 and partially within Designation 6741. An overland flow path is shown on the Auckland Council GIS mapping to run through the site.

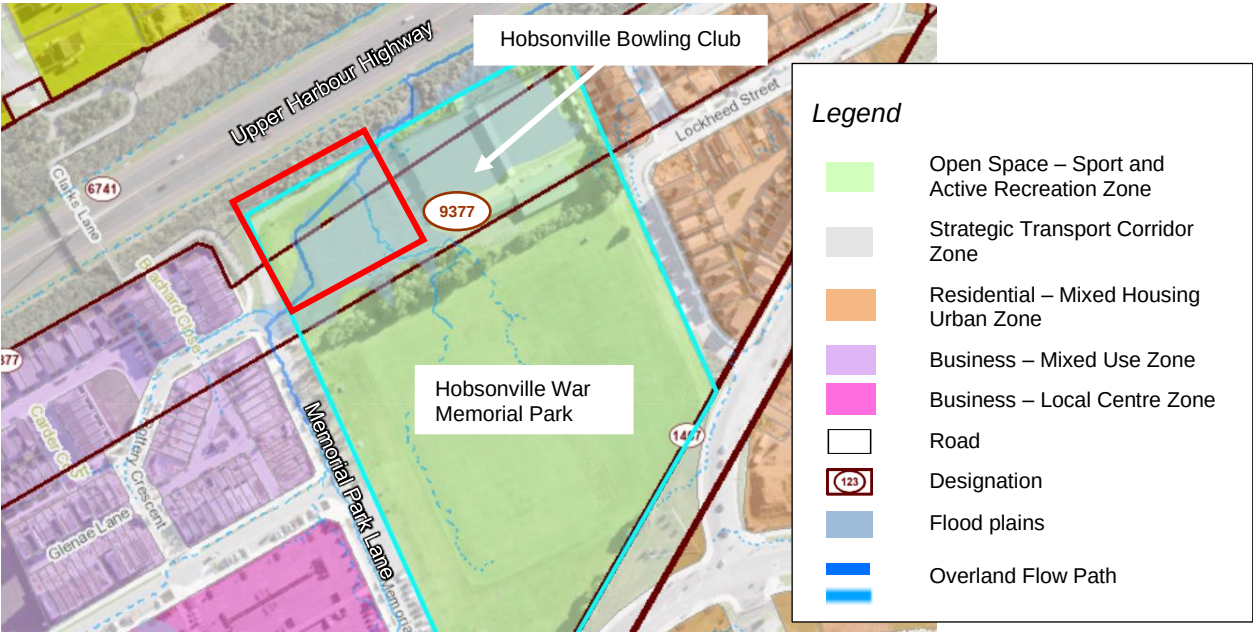


Figure 2-5. Shaft 16 works area location (outlined in red), and relevant zones, overlays, and designations applicable to the site under the AUP:OP.

Terrestrial fauna

The site is not considered to provide suitable habitat for lizards or bats. Birds recorded in proximity to the site in the last 10 years include only commonly found native avifauna with a conservation status of ‘Not Threatened’, and exotic species. The works are situated in close proximity to the Upper Harbour Highway,

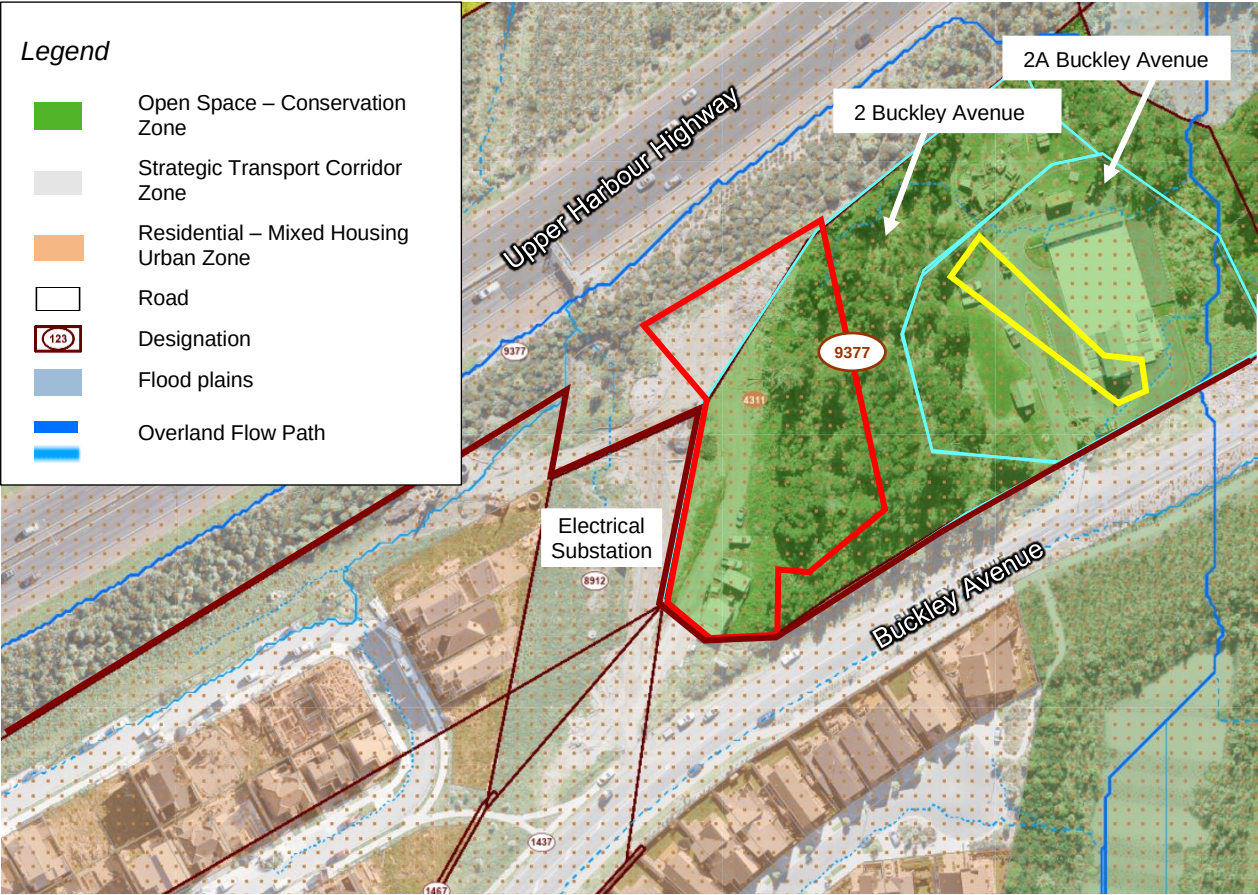
which is likely to result in continuous disturbance and noise to birds at the site. Due to the presence of only Not Threatened and exotic avifauna within proximity to the site and limited habitat availability, the ecological value of the site for birds is assessed to be low.

2.1.6 Shaft 17 and connection to the Hobsonville Pump Station

Shaft 17 will be located at 2 Buckley Avenue, which contains the Watercare Northern Interceptor Office, and in the adjacent motorway shoulder. Shafts 18 and 19 will be located at 2A Buckley Avenue, which contains the Hobsonville Pump Station, and has previously been used for wastewater treatment, including sludge application and waste disposal to land.

The area to the south west of the works area contains an electrical substation (owned by Vector), and residential housing. The area to the south of the works area includes residential housing and a constructed stormwater wetland. Vegetation at the site includes a small portion of native landscape planting adjacent to the motorway, and long grass.

The site is zoned Open Space - Conservation Zone and Strategic Transport Corridor Zone, and is completely within Designation 9377 and partially within Designation 6741.



Not Threatened and exotic avifauna within proximity to the site and limited habitat availability, the ecological value of the site for birds is assessed to be low.

2.2 Underlying geology and hydrogeology

A Groundwater and Settlement Effects Assessment has been prepared for the site and is provided in Appendix D. This assessment provides an assessment of the underlying geology and hydrogeology of the works area.

The assessment interprets the subsurface of the shaft locations to be underlain first by the Puketoka formation, which comprises: soft to very stiff clays and silts, or loose to dense sands, which occurred as mixtures and interbedded layers; and / or organic silt and peat with occasional wood material.

At depth, the Puketoka formation is underlain by variably weathered East Coast Bays Formation (ECBF). Weathered ECBF is characterised as residual soil to moderately weathered rock, consisting of uncemented or weakly cemented sandstone and mudstone. ECBF rock is characterised as slightly weathered to unweathered ECBF rock, consisting of cemented sandstone and mudstone.

Groundwater at the site and in the surrounding area is usually present in both perched and regional regimes. Perched groundwater can be present at near surface levels during the winter months, falling to around 3 to 4 m below ground level (bgl) in summer. Regional groundwater levels are governed by sea levels in Waitematā Harbour and water levels in tributary creeks which dissect the area. Based on groundwater level monitoring records, the aquifer type for the project area has been assessed as unconfined when groundwater levels are low. The aquifer type may be semi-confined (or confined) in some locations when groundwater levels / pressures are higher than during the summer, typically during winter months.

Groundwater is assessed to flow generally toward the north / north east across the project area in a muted reflection of the surface topography. The shallow groundwater discharges into the Waiarohia Stream and overland flow paths. Both the Waiarohia Stream and the overland flow paths flow in a north/northeast direction, discharging into the Upper Waitemata Harbour

2.3 Contaminated Land

A Ground Contamination Detailed Site Investigation (DSI) has been prepared for the site and is provided in Appendix E. The DSI assesses the historic land use and potential for contamination in the soils and groundwater of the project works area.

2.3.1 Soil

The DSI concludes that the Hazardous Activities and Industries List (HAIL) activities occurred or potentially occurred at the following locations directly along the proposed alignment:

- Wastewater treatment, sludge application, and waste disposal to land at the Hobsonville pump station connection at 2A Buckley Road
- Horticultural activity at the break pressure chamber and construction laydown area at 8 Spedding Road and 32 Mamari Road;
- Potential horticultural activity along the pipeline alignment at 4 Spedding Road, and potential historical horticultural activity at shaft 12 on the motorway shoulder;
- A transport yard along the pipeline alignment at 51 Trig Road;

A number of further HAIL activities occurred on land adjacent to and surrounding the proposed alignment, including a stockyard, further horticultural activities, sediment treatment ponds, a metal engineering workshop, a bowling green, and historic filling activities.

Soil sampling undertaken at Shafts 8, 10, 12, 14, 16, and 17 identified that the concentrations of contaminants in soil at these locations are below published background concentrations and comply with AUP permitted activity soil acceptance criteria. Concentrations of Total Petroleum Hydrocarbons were detected marginally above the laboratory detection limit in soils adjacent to Shaft 10, 14, 16 and 17, at levels which were considered insignificant. Concentrations of PAH were below the laboratory limits of reporting at all locations tested. The likelihood of soil contamination being encountered due to tunnelling beneath HAIL sites at 4 Spedding Road and 51 Trig Road is assessed as low due to the depth of proposed tunnelling works and limited potential for migration of contaminants to the tunnelling depth.

Due to updates in the alignment which occurred after the soil sampling was undertaken, soil sampling has not been undertaken at the identified HAIL sites at 8 Spedding Road, 32 Mamari Road, and 2A Buckley Road. It is not known whether the concentrations of contaminants in soil at these sites are within published background concentrations, or meet AUP permitted activity soil acceptance criteria.

2.3.2 Groundwater

Groundwater samples were taken from locations adjacent to shaft sites for Shafts 8 to 17. Shallow groundwater samples were undertaken between 4 – 9.7 m, whilst deep groundwater samples were taken at depths of between 11-27 m. Due to updates in the alignment subsequent to groundwater testing being undertaken, no groundwater sampling has been undertaken at the break pressure chamber, or shafts 18 or 19, and no shallow sample has been taken at Shaft 8.

Shallow samples taken adjacent to proposed Shaft 12, 14, and 17 contained chromium, copper, nickel and / or zinc above both background and above the 95% freshwater protection trigger levels. Deep samples taken in proximity to Shaft 14 also contained a very slight exceedance of both background and 95% freshwater protection trigger levels for chromium.

The remainder of shallow and deep samples taken from Shafts 8 to 17 were below either the background or the trigger levels.

3 Description of the Project

3.1 Purpose of the works

As described in Section 1, the Northern Interceptor (Phase 2 Stage 1) is a section of the wider Northern Interceptor pipeline which is required to deliver wastewater from the North West region of Auckland through to the Rosedale Wastewater Treatment Plant. The Massey Connector will deliver wastewater from the Whenuapai and Redhills catchments into the Northern Interceptor. Once completed, the Massey Connector will provide wastewater servicing capacity in the order of 13,000 dwellings or 39,000 people, whilst the Northern Interceptor will provide capacity for approximately 466,000 dwellings, and free up capacity at the Mangere Wastewater Treatment Plant to service future growth in Central and South Auckland.

Together, the Northern Interceptor and Massey Connector are required to deliver the necessary wastewater infrastructure network to the North West region of Auckland to respond to the significant growth anticipated over the next 20 years, and enable the development potential of the land in the wider area to be unlocked.

3.2 Physical Works

Detailed drawings of the proposed works are provided in Appendix A.

The physical works include (refer to Figure 3-1 to Figure 3-3):

- A break pressure chamber located at 8 Spedding Road, to transfer wastewater from rising main pipelines from Massey North and Whenuapai into the Massey Connector gravity pipeline.
- A gravity pipeline (the Massey Connector) extending from the proposed break pressure chamber at 8 Spedding Road to the proposed Northern Interceptor at 27 Trig Road, Whenuapai (approximately 1km long and 2100mm in diameter);
- A new gravity pipeline (Phase 2 / Stage 1 of the Northern Interceptor) extending from 27 Trig Road, Whenuapai to 2 Buckley Avenue, Hobsonville (approximately 2.8km long and 2100mm in diameter);
- A gravity pipeline (the Hobsonville Pump Station Connection), extending from the Northern Interceptor to the existing Hobsonville Pump Station (approximately 40 m in length, and 800 mm in diameter);
- Nine shafts along the alignment to provide access for construction activities (refer to Table 3-1 for further details). Once construction is complete:
 - The shaft at 8 Spedding Road will be converted to the break pressure chamber;
 - 3 shafts along the Northern Interceptor and 2 shafts for the Hobsonville Pump Station Connection will be converted to permanent manholes for ongoing operation and maintenance.
 - The shafts along the Northern Interceptor will contain the following:
 - An odour treatment device (and for Shaft 17, a local switchboard to power actuator and odour control unit);
 - A 4 m wide access road to provide vehicle access to and around the shaft; and
 - A chain link fence and access gate to secure the perimeter of the site.
 - The remaining 3 shafts along the Northern Interceptor will be disestablished.

Table 3-1. Details of the break pressure chamber and permanent shafts.

Activity	Location	Shaft type	Diameter (m)	Depth (m)
Break pressure chamber shaft	8 Spedding Road	Permanent	7.5	9.4
Shaft 8	27 Trig Road	Permanent	13	17.7
Shaft 10	Upper Harbour Highway shoulder adjacent to 37 Westpoint Drive	Temporary	6.75	26.7
Shaft 12	Upper Harbour Highway shoulder adjacent to 19 Westpoint Drive	Temporary	11.25	18.6
Shaft 14	4 Sinton Road	Permanent	7.5	25.3
Shaft 16	1 Memorial Avenue	Temporary	11.25	21.5
Shaft 17	2 Buckley Avenue	Permanent	12	14.0
Shaft 18	2A Buckley Avenue	Permanent	6	4.5
Shaft 19	2A Buckley Avenue	Permanent	2.5	5.1

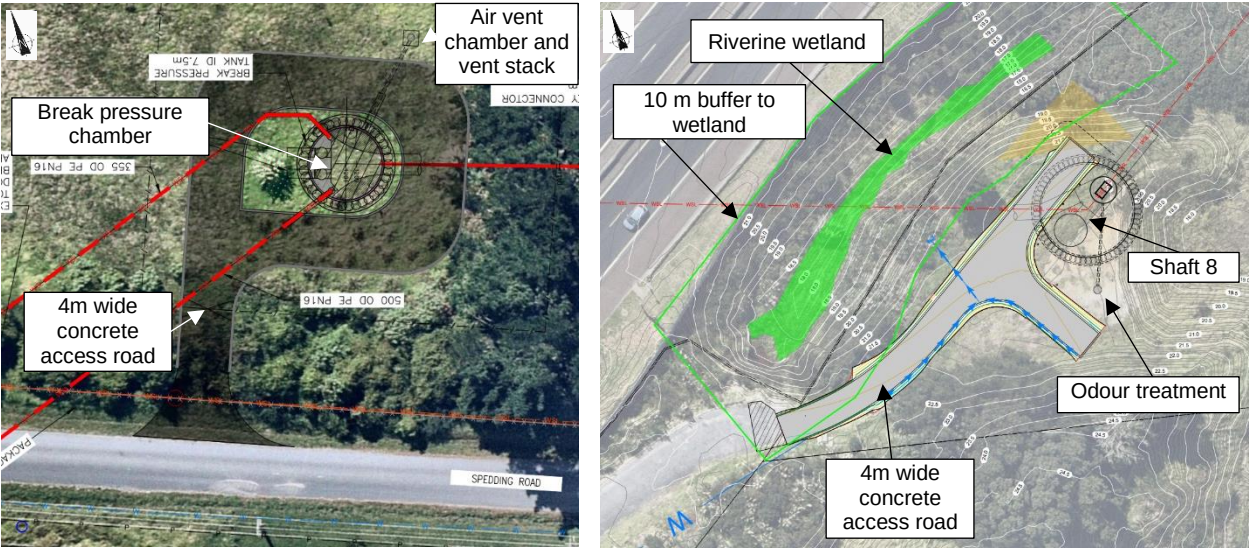


Figure 3-1. Permanent works at the break pressure chamber (left) and Shaft 8 (right) (riverine wetland in green, 10 m buffer to stream and wetland shown by green line)

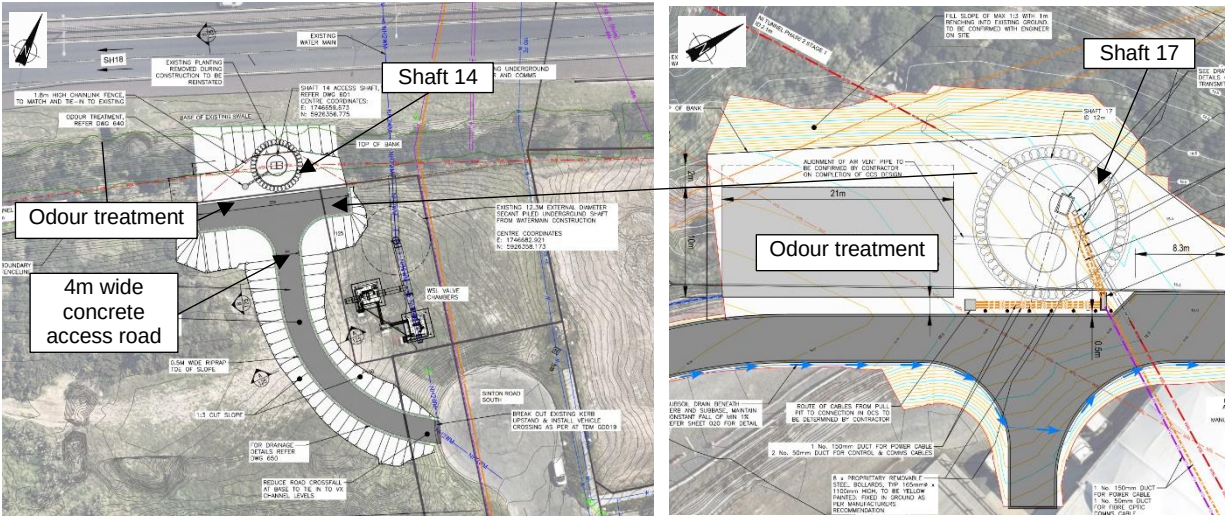


Figure 3-2. Permanent works for Shaft 14 (left) and Shaft 17 (right).



The following sets out the anticipated construction methodology of the proposed works. Whilst this is indicative only, and those implemented on site may differ once a contractor is appointed, the construction methodology is broad enough that any changes to it are not expected to change the outcome of the assessment of effects on the environment set out in Section 5.

The Project is expected to take approximately 36 months to complete.

Outside of the designation, general site activities, and retrieval of the TBM, will be undertaken during standard working hours (ie. between 7am and 6pm, Monday to Friday, and 8am to 6pm Saturday).

Tunnelling will generally occur 24 hours a day/ 7 days a week except where the TBM is within 30 m (slant distance) of the dwellings at 6 Spedding Road and 92 Trig Road. At these properties tunnelling will only occur between 7am and 10pm unless prior permission from the occupiers of those properties has been obtained to allow tunnelling between 10pm and 7am.

Works hours for the remaining activities within Designation 9377 will be confirmed within the Outline Plan of Works which will be submitted 20 days prior to construction in accordance with Condition 3 of the designation.

Construction of the Massey Connector, Northern Interceptor, and the Hobsonville Pump Station Connection between Shaft 17 and Shaft 18 will be undertaken by trenchless construction methods. The section of the Hobsonville Pump Station Connection between Shaft 18 and Shaft 19 will be undertaken by either trenchless or trenched construction methods.

Works will proceed in a staged manner, with multiple work sites operational at any one time. Each shaft will be completed at least 1 month prior to the shaft being required for tunnelling purposes.

3.3.2 Site establishment

3.3.2.1 Access

Prior to establishment of the laydown areas at Shafts 10 and 12, a stabilised 4 m wide access road will be constructed to provide access to the shaft sites. The access road will run along the shoulder of the Upper Harbour Highway, and be accessed via vehicle crossings at 18 and 19 Westpoint Drive (refer to Figure 3-7 and Figure 3-8 below for details). The configuration of the access will allow for 1 way circulation through the site (excepting the section along the top of the motorway shoulder to access Shaft 10). The remainder of sites are either immediately adjacent to roads or have an existing private access way from the road (refer to Table 3-2 for details). Further details regarding site access for shafts within Designation 9377 will be provided in the Outline Plan of works in accordance with the conditions of Designation 9377.

3.3.2.2 Laydown Areas

A construction laydown area will be required to facilitate construction at each shaft location. The size of each laydown area is outlined in Table 3-2 below. Each laydown area will include an area for temporary stockpiling, materials (including approximately 2 days of pipe production) and equipment storage, light vehicle parking, a site office, workshop, ablutions block, and water supply and tanks.

Indicative site layouts for each location are provided in



Figure 3-4 to Figure 3-5 below.

The laydown area at 32 Mamari Road adjacent to the break pressure chamber will serve as a Contractor Area Hub for the duration of the project. The Contractor Area Hub will be the main site for pipe and material storage for the Project, containing pipe storage for between 500 and 1000 m of pipe, as well as heavy vehicle storage as required. The main project site office will be located at Shaft 17 at 2 Buckley Avenue, which is currently being used by the Northern Interceptor project team.

As part of the site establishment works, erosion and sediment controls will be installed around the extent of the works area in accordance with the Erosion and Sediment Control plan in Appendix F. Erosion and

sediment controls are discussed in detail in Section 5.4 of this report and include the installation of silt fences and clean water diversion bunds around earthworks areas.

Table 3-2. Contractor Areas, laydown areas, and site access arrangements

Activity	Location	Area (m ²)	Site Access
Break pressure chamber shaft	8 Spedding Road and 32 Mamari Road	10,000	New vehicle crossings to Mamari Road (entrance only), and Spedding Road (exit only)*
Shaft 8	27 Trig Road	3,300	Existing vehicle crossing to Trig Road
Shaft 10	Upper Harbour Highway shoulder	1,500	New access road with new vehicle crossings to 18 and 19 Westpoint Road.
Shaft 12	Upper Harbour Highway shoulder	2,200	
Shaft 14	4 Sinton Road	6,500	Existing vehicle crossing to Sinton Road
Shaft 16	1 Memorial Avenue	5,000	Existing vehicle crossing to 1 Memorial Avenue
Shaft 17	2 Buckley Avenue	6,000	Existing vehicle crossing to 2 Buckley Avenue
Shaft 18			

*Vehicle crossings will be established as part of the Whenuapai – Redhills Package 1 works if construction for Whenuapai – Redhills Package 1 precedes construction of Whenuapai – Redhills Package 2.



Figure 3-4. Indicative site layout for construction laydown area at 8 Spedding Road and 32 Mamari Road.



Figure 3-5. Indicative site layout for Shaft 8 at 27 Trig Road.



Figure 3-6. Indicative site layout for Shaft 10 on Upper Harbour Highway shoulder, adjacent to 37 Westpoint Drive.



Figure 3-7. Proposed access road layout to Shafts 10 and 12, including vehicle crossing to 19 Westpoint Drive.



Figure 3-8. Indicative site layout for Shaft 12 on the Upper Harbour Highway shoulder (adjacent to 19 Westpoint Drive).



Figure 3-9. Indicative site layout for Shaft 14 at Sinton Road East.

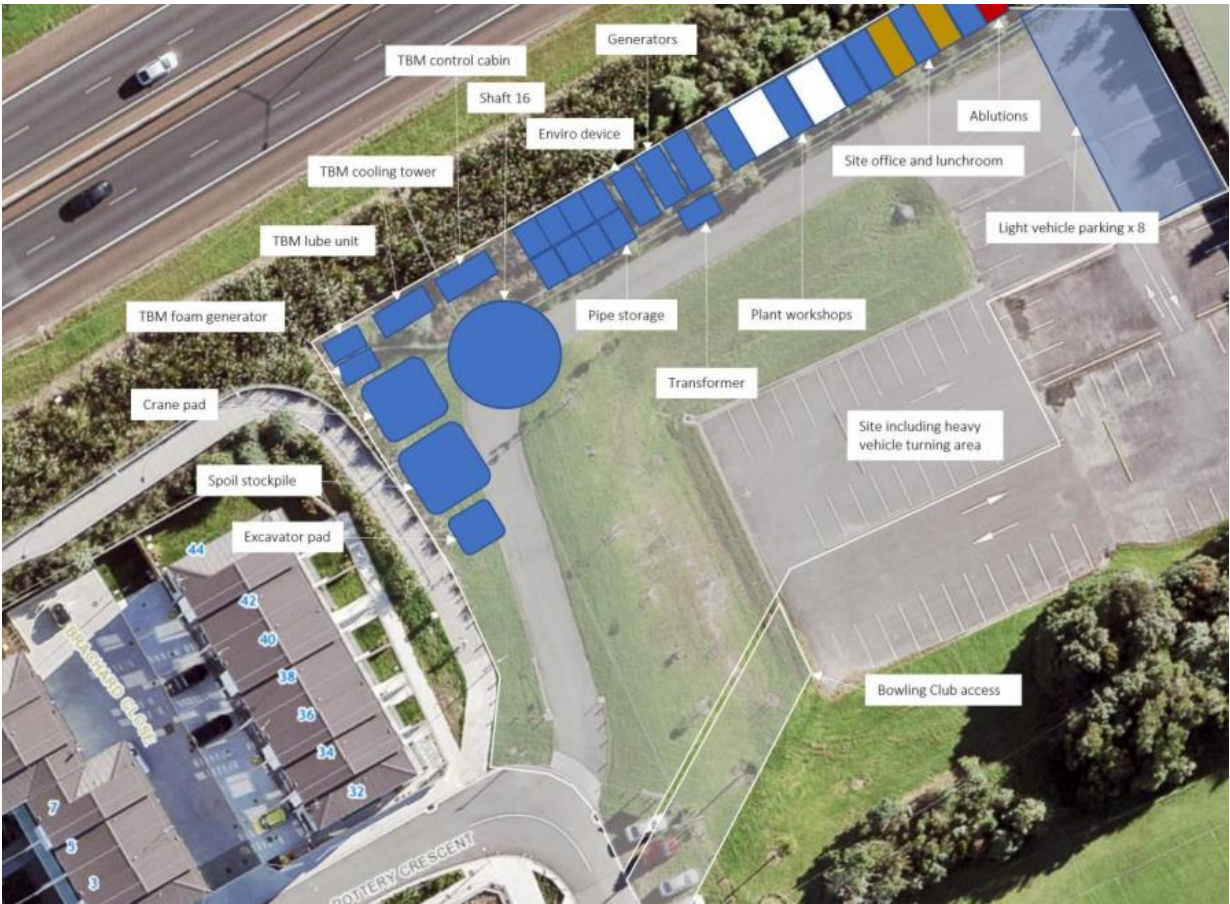


Figure 3-10. Indicative site layout for Shaft 16 at 1 Memorial Park Lane.



Figure 3-11. Indicative site layout for Shaft 17 at 2 Buckley Avenue.

3.3.3 Temporary and Permanent Shaft Construction

The proposed works include construction of 3 x launch shafts and 5 x reception shafts, which vary between 6 m and 14 m in diameter (refer to Table 3-3 below). The shafts will be constructed with secant piling which will be carefully placed to overlap in order to limit the amount of groundwater entering the shaft.

Prior to shaft construction, a stable pad will be installed for the piling rig, and the secant pile guide ring will be installed. Piles will then be installed, the ground excavated to 1m and the capping beam installed. The remainder of the shaft will then be excavated with support beams installed as required. Once excavation is complete a temporary base slab will be installed. The shaft will then be ready to either launch or receive the TBM.

The Hobsonville Pump Station Connection works include construction of 2 x launch shafts. Shaft 18 will be constructed using secant or sheet piling, whilst Shaft 19 will be constructed by trench box, slide rail or sheet pile.

Dewatering will occur during excavation of the shaft. Minor additional dewatering may occur during tunnelling operations, with leaks sealed as they are discovered.

Table 3-3. Shaft diameter, depth, and construction duration

Activity	Shaft Type	Shaft type	Inner shaft diameter (m)	Depth (m)	Duration of construction	Approximate duration shaft will be open
Break pressure chamber shaft	Reception	Permanent	7.5	9.4	68 days	14 months
Shaft 8	Launch	Permanent	13	17.7	77 days	15 months
Shaft 10	Reception	Temporary	6.75	26.7	88 days	13 months
Shaft 12	Launch	Temporary	11.25	18.6	53 days	11 months
Shaft 14	Reception	Permanent	7.5	25.3	96 days	11 months

Shaft 16	Launch	Temporary	11.25	21.5	82 days	14 months
Shaft 17	Reception / Launch	Permanent	12	14	85 days	10 months
Shaft 18	Reception / Launch	Permanent	6	4.5	> 30 days	> 30 days
Shaft 19	Reception	Permanent	2.5	5.1	> 30 days	> 30 days



Figure 3-12. Example of construction of a shaft for a TBM (Photograph: Rachael Clark, 20th October, 2022)

Once tunnelling is completed, the temporary shafts (shafts 10, 12 and 16) will be backfilled to the surface, the capping beam and top 1m section of piles will be removed, and the site disestablished and reinstated to the design requirements.

The temporary shafts 8, 14, 17, 18, and 19 will be converted into permanent shafts / manholes. This will involve removing the temporary base slab, excavating the shaft to the final level for permanent works, and installing the permanent structure. The cavity between the permanent structure and the shaft wall will progressively be backfilled, and then once completed, the site disestablished and reinstated to the design requirements.

3.3.4 Tunnelling

The Northern Interceptor and Massey Connector will be installed using an Earth Pressure Balancing (EPB) tunnel boring machine (TBM). The TBM will be launched at launch shafts, then retrieved from reception shafts once the tunnelling drive is complete. The sequence of tunnelling drives generally moves from east to west along the alignment as follows (refer to Figure 3-13 below):

1. Drive 1: Shaft 16 at 1 Memorial Avenue to Shaft 17 at 2 Buckley Avenue
2. Drive 2: Shaft 16 at 1 Memorial Avenue to Shaft 14 at 4 Sinton Road
3. Drive 3: Shaft 12 on the Upper Harbour Highway Shoulder to Shaft 14 at 4 Sinton Road
4. Drive 4: Shaft 12 on the Upper Harbour Highway Shoulder to Shaft 10 at the Upper Harbour Highway Shoulder
5. Drive 5: Shaft 8 at 27 Trig Road to Shaft 10 on the Upper Harbour Highway Shoulder
6. Drive 6: Shaft 8 at 27 Trig Road to the break pressure chamber at 8 Spedding Road

Tunnelling from Shaft 17 to Shaft 18 and the subsequent tunnelling or open trenching to the Hobsonville Pump Station is not critical path and can therefore be completed at any time during the works period.

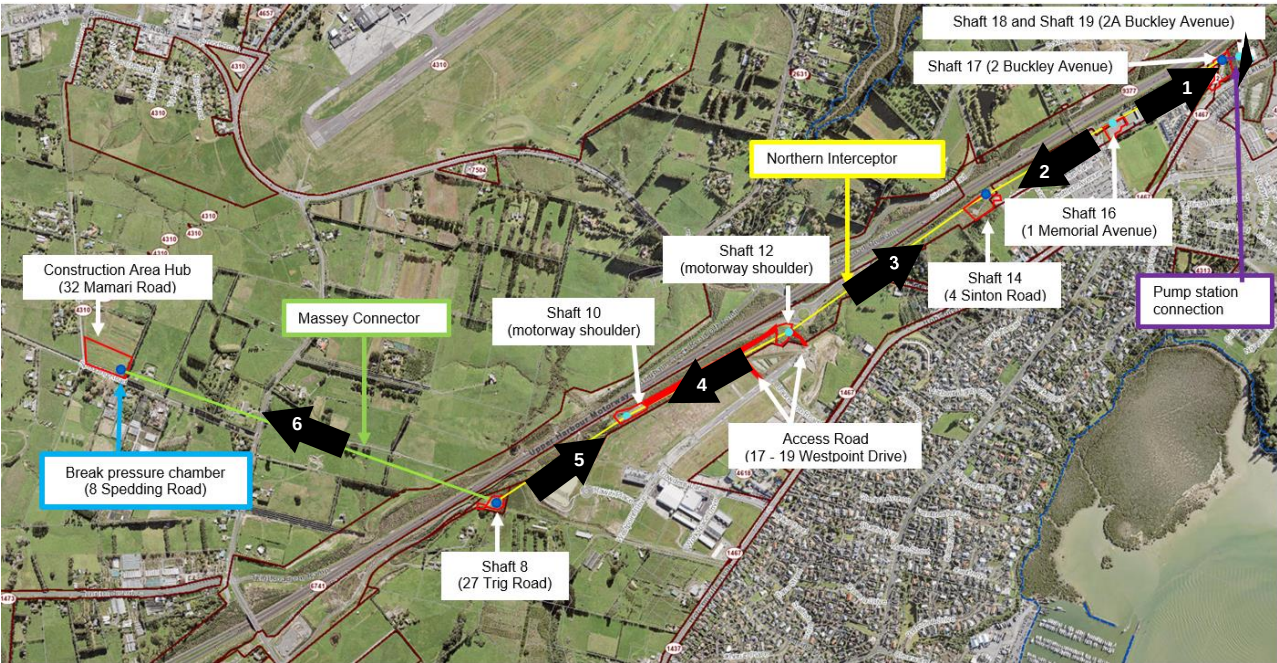


Figure 3-13. Tunnelling drive sequence

The TBM has a rotating cutting head which is pushed through the ground using a hydraulic jacking frame which is set up at each launch site (see Figure 3-15).



Figure 3-14. Earth pressure balance TBM including hydraulic jacking frame.

As the TBM is pressed into the tunnel face, the rotating cutting face excavates the ground material (spoil), which passes through openings in the cutting face. The spoil is then removed from the tunnel via the launch shaft, temporarily stockpiled on site, and then trucked offsite on a daily basis to an appropriate disposal facility (see Figure 3-15). As the TBM progresses forward sequential pieces of pipe are lowered into the jacking frame and pushed forward, forming the permanent lining of the tunnel structure.

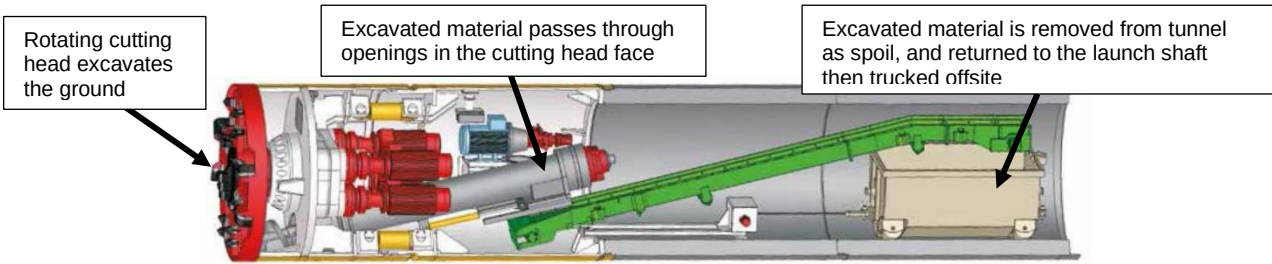


Figure 3-15. Earth pressure balance TBM

The TBM excavates a slightly bigger area than the installed pipe, to allow enough space for installation. This gap will be closed by pumping a bentonite lubrication mixture into the overcut area. This layer of bentonite forms a sleeve around the main body of the TBM and jacking pipes, providing lubrication to allow the tunnel to slide through the ground.

3.3.5 Open Trenching

The Hobsonville Pump Station Connection between Shaft 18 and Shaft 19 will be installed by either trenchless or trenched methods, whilst the final section of pipe between Shaft 19 and the Hobsonville Pump Station installed by open trenching.

The trench will be approximately 2 m wide, and approximately 6 m deep and supported with sheet piles, with the pipe laid, and the trench backfilled. The part of the trench that is open at any given time will be no longer than 10 days. Once the pipe has been installed the disturbed area will be backfilled and reinstated to its pre-construction condition. Any excess material will be disposed of off-site.

3.3.6 Vegetation removal

Works to establish the site at 27 Trig Road will require the removal of approximately 2,300 m² vegetation from within the riparian area of the stream and wetland. Approximately 330 m² of the vegetation removal will be permanent in order to provide a sealed site access for operational purposes. The vegetation to be removed includes 2 protected trees, approximately 150 m² of native vegetation (manuka, kanuka and karamū) from either side of the accessway, and approximately 2,150 m² of exotic grasses, scrub, and pest plants interspersed with sparse juvenile native vegetation (coprosma). For the purposes of clarity, approximately 380 m² of the vegetation to be removed, and 60 m² of the vegetation to be permanently removed, is within 10 m of the riverine wetlands.

Works to establish the access road associated with shafts 10 and 12 will require removal of approximately 450 m² from 19 Westpoint Drive which includes 1 protected tree, and approximately 150 m² of native vegetation from the riparian area of the stream and wetland above the culvert adjacent to shaft 12.

The remainder of vegetation which will be removed from the works area is either within the extent of Designation 9377 (which will be covered in subsequent Outline Plan of works to be submitted prior to construction), or not protected.

3.3.7 Earthworks

Earthworks will be required at each works location to establish the laydown areas, shafts, and for the tunnelling or open trenching. Preparatory earthworks include stripping topsoil, covering the areas with a layer of hardfill over a geotextile membrane with the metal material compacted, and establishing the laydown area including temporary bunding for the stockpiling of waste material.

Excavated material from the tunnelling will be retrieved from the launch shaft of the drive, then trucked offsite and disposed of at an appropriate facility. For the parts of the pipeline installed by open trenching, where

material meets the definition of cleanfill it will be temporary stockpiled and backfilled where possible. Any additional or contaminated material, will be taken offsite for disposal.

The approximate area and volume of earthworks for each project component are outlined below.

Table 3-4. Approximate earthworks areas and volumes for each works location

Activity	Earthworks (m ²)	Earthworks (m ³)	Tunnel spoil (m ³)
Break pressure chamber	10,000	450	-
Shaft 8*	3,300	2,400	8,748
Shaft 10, 12, and access road**	9,800	6,000	6,062
Shaft 14	6,500	1,336	-
Shaft 16	5,000	1,370	4,221
Shaft 17 to 19	2,000	1,800	30

*all earthworks at Shaft 8 are within 50 m of a stream

** greater than 2,500 m² of earthworks at Shafts 10 and 12 and the associated access road are on land with a slope greater than 10 degrees

3.3.8 Site reinstatement and planting

Following completion of the works, erosion and sediment controls will be removed and the sites will be reinstated. This includes approximately 150 m² of riparian planting at 27 Trig Road, 150 m² of riparian planting at Shaft 12, and reinstatement planting undertaken on a 1:1 basis at 18 and 19 Westpoint Drive (refer to 5.3 for further details) or as otherwise agreed with the asset owner.

3.3.9 Traffic

Construction traffic will be managed through a Construction Traffic Management Plan.

The construction laydown area at 32 Mamari Road, which is outside of the designation, will operate as a pipe storage yard and main contractor area hub. It is anticipated that the site will generate up to approximately 12 trucks per day over the 36 month construction period, with the number of truck movements depending on the progress of the tunnelling. Onsite parking will be provided for approximately 10 light vehicles.

4 Reasons for the Application

This section sets out the resource consents sought for the project, and the aspects of the project that can be undertaken as a permitted activity, under the Auckland Unitary Plan: Operative in Part (AUP:OP) and the National Environmental Standard: Freshwater (NES F).

4.1 Auckland Unitary Plan: Operative in Part (AUP:OP)

4.1.1 Resource consents sought

Resource consent is sought for a **Discretionary Activity** overall under the AUP:OP for the matters set out in Table 4-1.

For the purposes of clarity, the Massey Connector, and the section of the Shaft 10 – 12 access road at 18 and 19 Westpoint Drive, are located outside of Designation 9377 and therefore require resource consents for district plan activities subject to Section 9(3) of the RMA, as well as regional plan activities subject to Section 9(2) of the RMA..

The remainder of the activities are located within Designation 9377 and require resource consents for regional plan activities only subject to Section 9(2) of the RMA. As noted previously, an Outline Plan will be prepared prior to construction for works in Designation 9377 prior to construction in accordance with 176a of the RMA.

Table 4-1. List of proposed activities which require resource consent under AUP: OP

Rule	Activity Status	Location	Comment
District consents subject to s9(3) of the RMA			
E25.4.1(A2) Activities which exceed permitted activity standards (vibration)	Restricted Discretionary Activity	Pipeline underneath 6 Spedding Road and 92 Trig Road	The anticipated construction vibration levels are assessed in the Construction Noise and Vibration Assessment provided in Appendix G. Compliance is anticipated, with the exception of the night-time vibration amenity limit at 6 Spedding Road and 92 Trig Road due to operation of the TBM within 30m of the dwelling. Construction vibration which exceeds permitted activity standards requires resource consent for a Restricted Discretionary Activity under Rule E25.4.1(A2).
E26.4.3.1(A92) Tree alteration or removal of any tree greater than 4m in height and/or greater than 400mm in girth (open space zone)	Restricted Discretionary Activity	Access road at 19 Westpoint Drive	The access road at 19 Westpoint Drive is located outside of the designation. Works to construct the access road to Shaft 10 and 12 will require removal of 1 protected tree which is greater than 4m in height. Removal of trees greater than 4 m in height in the open space zone requires resource consent under E26.4.3.1(A92).
E26.5.3.1(A97) Earthworks greater than 2500m ²	Restricted Discretionary Activity	Break pressure chamber, access road at 18 and 19 Westpoint Drive	Earthworks of up to 10,000 m ² are required as part of the construction of the break pressure chamber and associated construction yard. In addition, earthworks of approximately 400 m ² outside of the designation are required to construct the access road, with the total area of earthworks for Shaft 10, 12 and the access road totalling 9,800 m ² .

Rule	Activity Status	Location	Comment
			Earthworks greater than 2,500 m ² require resource consent for a Restricted Discretionary Activity under Rule E26.5.3.1(A97).
E26.5.3.1(A97A) Earthworks greater than 2,500 m ³	Restricted Discretionary Activity	Access road at 18 and 19 Westpoint Drive	Earthworks to construct the portion of access road at 18 and 19 Westpoint Drive is anticipated to be < 2,500 m³. However, the total area of earthworks for Shaft 10, 12 and the access road is approximately 6,000 m³. Earthworks greater than 2,500 m³ require resource consent for a Restricted Discretionary Activity under Rule E26.5.3.1(A97A).
E40.4.1(A24) Specific temporary activities that are not provided as a permitted activity	Restricted Discretionary Activity	Break pressure chamber, access road at 18 and 19 Westpoint Drive	The construction laydown area at 32 Mamari Road, and vehicle crossing for the access road at Shaft 10 and 12, will be in place to support the wider project for a period of approximately 36 months. Temporary activities associated with construction which are in place for greater than 24 months are not provided for as a permitted activity and require resource consent for a Restricted Discretionary Activity under Rule E26.5.3.1(A24).
Regional consents subject to s9(2) of the RMA			
E7.4.1(A20) Dewatering not meeting permitted activity standards (Break pressure chamber and all shafts)	Restricted Discretionary Activity	Break pressure chamber, Shafts 8 – 19	Construction of the break pressure chamber and shafts will require dewatering for a period of up to 3 years, which exceeds the threshold of 30 days outlined in Standard E7.6.1.6(3). The water take will only occur during construction of the pipeline. Dewatering for a period of greater than 30 days requires resource consent for a Restricted Discretionary Activity under Rule E7.4.1(A20).
E7.4.1(A28) Diversion of groundwater caused by any excavation (including trench) or tunnel that does not meet the permitted activity standards	Restricted Discretionary Activity	Shafts 8 and 10	Dewatering from Shaft 8 is assessed to reduce the natural groundwater level by approximately 1.9 m at the boundary of the adjoining site, which is the Upper Harbour Highway. Shaft 10 will be excavated to a depth of approximately 26.7 m, at a location approximately 30 m from the building on the adjacent site at 37 Westpoint Drive. Diversion of groundwater caused by excavation which reduces the natural groundwater level by more than 2 m on the boundary of any adjoining site, and excavations with a depth which is not at least equal to the distance to any existing building on an adjoining site, do not meet permitted activity standards E7.6.1.10(3) and (5(a)) respectively and require resource consent for a Restricted Discretionary Activity under Rule E7.4.1(A28). Whilst it is assessed that the standards are likely to be met, resource consent is sought out of an abundance of caution.
E26.3.3.1(A77) Removal of greater than 50 m ² of vegetation and trees greater than 6 m in	Restricted Discretionary Activity	Shafts 8 and 12	Works will remove: ■ 3 trees which are greater than 6 m in height and approximately 2,300 m² of riparian vegetation from the riparian area of the stream and wetland at Shaft 8.

Rule	Activity Status	Location	Comment
height or 600 mm in girth from the riparian area (Shafts 8 and 12)			■ approximately 150 m² of vegetation from the riparian area of the stream and wetland at Shaft 12. Removal of trees greater than 6 m in height and 600 mm in girth, or greater than 50 m ² of vegetation from the riparian area of the stream and / or wetland does not comply with Standard E26.3.5.2(3) and therefore requires resource consent for a Restricted Discretionary Activity under Rule E26.3.3.1(A77).
E26.5.3.2(A106) and (107) Earthworks greater than 2,500 m ² where land has a slope equal to or greater than 10 degrees	Restricted Discretionary Activity	Shafts 10 and 12 and associated access road	Earthworks of up to 9,800 m ² are required as part of the construction of Shaft 10 and 12 including associated access roads. The majority of the earthworks work will be on slopes ranging from 10 degrees to 35 degrees. Earthworks greater than 2,500 m ² where land has a slope equal to or greater than 10 degrees requires resource consent for a Restricted Discretionary Activity under Rule E26.5.3.2(A106).
E26.5.3.2(107) Earthworks greater than 2,500 m ² in the Sediment Control Protection Area.	Restricted Discretionary Activity	Shafts 8, 12, and associated access road.	Earthworks of up to 3,400 m ² and 3,000 m ² are required within the Sediment Control Protection Area at Shaft 8 and Shaft 12 respectively. Earthworks greater than 2,500 m ² within the Sediment Control Protection Area, requires resource consent for a Restricted Discretionary Activity under Rule E26.5.3.2(A106) and (A107).
E30.4.1(A7) Discharges of contaminants into air, or into water, or onto or into land not meeting controlled activity Standard E30.6.2.1	Discretionary Activity	32 Mamari Road, 8 Spedding Road, and 2A Buckley Avenue	Soil disturbance exceeding 200 m ³ over a period of greater than 2 months is required at three HAIL sites, including 32 Mamari Road, 8 Spedding Road, and 2A Buckley Avenue. No soil investigation data is available at these sites to confirm whether the concentrations of contaminants within the soil meets AUP permitted activity criteria. Consent is therefore sought as a Discretionary Activity under E30.4.1(A7).

4.1.2 Permitted activities

A number of activities associated with the project can be undertaken as a permitted activity under the AUP:OP as detailed in Table 4-2.

Table 4-2. Permitted activities under the AUP:OP

Rule	Location	Comment
District matters		
E24.4.1(A1) Activities that comply with all the relevant permitted activity standards	Break pressure chamber	Works at the break pressure chamber at 8 Spedding Road are not planned to be lit at night. If site lighting is required to retrieve the TBM, this will be for a short duration (eg. 24 to 48 hours), and use trailerised lighting setups directed towards the site which will meet all the relevant permitted activity standards.
E25.4.1(A1) Noise and vibration that complies with all the relevant	Break pressure chamber and pipeline	Construction will occur within normal working hours, from Monday to Saturday, 7.30am – 6pm. Noise arising from construction activities is expected to meet permitted activity standards outlined in Table E25.6.27.1 (refer to Appendix G).

Rule	Location	Comment
permitted activity standards		
E26.5.3.1(A96) Earthworks up to 2,500 m ³	Break pressure chamber	Earthworks of approximately 450 m ³ are required to construct the break pressure chamber. Earthworks less than 2,500 m ³ is a Permitted Activity under Rule E26.5.3.1(A95).
Regional rules		
E4.6.1(A2)(d) Discharge of water onto or into land and / or into water from temporary discharge of diverted uncontaminated groundwater	All locations	Groundwater concentrations of chromium, copper, nickel and / or zinc, were reported above the 95% and 80% Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC guidelines) where also exceeding published background concentrations at Shaft 12, 14, and 17. No groundwater quality data is available for Shafts 8 or 10. Extracted groundwater will be treated appropriately prior to discharge, with discharge undertaken in accordance with best management practice to minimise the contaminants to the extent practicable. Permitted activity standards include requirements that after reasonable mixing, the discharge does not: ■ render freshwater unsuitable for consumption by farm animals; ■ change the natural temperature of the receiving water by more than 3 degrees Celsius; ■ change the natural pH of the water by more than 1pH unit; ■ cause any significant adverse effects on aquatic life; or ■ exceed the 95% ANZECC guidelines (or the natural background level). The contractor will ensure that sufficient mixing is achieved so that the standards are met. Where standards cannot be met, groundwater will be discharged to land or into the wastewater network as tradewaste.
E7.4.1 (A17) Dewatering or groundwater level control associated with a groundwater diversion permitted under the Unitary Plan	Shaft 18 to Hobsonville pump station	<u>Open trenching</u> The pipeline will be installed via open trenching between Shaft 19 and the Hobsonville pump station, and potentially also between Shaft 18 and 19. Trenched works will comply with standard E7.6.1.6 as the water take will not be geothermal water, the water take at any one location will be less than 30 days and will only occur during construction.
E7.4.1(A27) Diversion of groundwater caused by any excavation (including trench) or tunnel	Pipeline, Break pressure chamber, Shafts 12 - 19	<u>Open trenching</u> The pipeline will be installed via open trenching between Shaft 19 and the Hobsonville pump station, and potentially also between Shaft 18 and 19. The ground diversions associated with the trenched construction are exempt from Standards E7.6.1.10(2)-(6) because the trenches be progressively opened, closed and stabilised with each section remaining open for no longer than 10 days. <u>Trenchless</u> Permitted activity standards are met for these works as follows: ■ The excavation will not exceed 1 ha in total area ■ The natural groundwater level will not be reduced by more than 2 m on the boundary of any adjoining site ■ The works will not impede the flow of groundwater. ■ The distance to any existing building or structure on an adjoining site from the edge of the excavation will be at least equal to the depth of the excavation

Rule	Location	Comment
E26.5.3.2(A101) Earthworks up to 10,000 m ² where land has a slope less than 10 degrees outside the Sediment Control Protection Area (Contractor Area Hub and Break pressure chamber)	Break pressure chamber, and Shafts 14, 16 and 17 – 19	Earthworks of up to 10,000 m ² are required as part of the construction of the following locations: Break pressure chamber; Shaft 14; Shaft 16; and Shafts 17 – 19. As there is a minimum of 300 m between each of these sites, they are considered to be separate locations for the purpose of calculating thresholds. The land at these sites has a slope less than 10 degrees, and the sites are not in a Sediment Control Protection Area. Earthworks up to 10,000 m ² where land has a slope less than 10 degrees outside the Sediment Control Protection Area is a Permitted Activity under Rule E26.5.3.2(A101).
E26.3.3.1(A74) Pest plant removal (Shaft 8)	Shaft 8	Works will require removal of pest plants at Shaft 8 including 2 wattle trees, gorse, and pampas grass. Removal of pest plants is a permitted activity under Rule E26.3.3.1(A74).

4.2 National Environmental Standards for Freshwater Regulations 2020 (NES:F)

4.2.1 Resource consents sought

The proposed infrastructure meets the definition of ‘specified infrastructure’ as defined in the National Policy Statement for Freshwater Management (NPS:FM). Specified infrastructure is defined as infrastructure that delivers a service operated by a lifeline utility. Watercare is a lifeline utility, as it is an entity which provides a waste water or sewerage network (Civil Defence Emergency Management Act 2002, Schedule 1, Part B (4))².

As specified infrastructure, the project requires resource consent as a **Discretionary Activity** under the NES: F for the activities outlined in Table 4-3 below.

Table 4-3. Proposed activities which require resource consent under NES:F

Clause	Activity status	Comment
45(1) Vegetation clearance within, or within a 10 m setback from, a natural wetland for the purpose of constructing specified infrastructure.	Discretionary Activity	Resource consent is required under the NES:F as a Discretionary Activity in accordance with Clause 45, for: ■ Vegetation clearance (45(1)) and earthworks within a 10 m setback from a natural wetland (45(2)) as follows: – At Shaft 8: ▪ Approximately 60 m² of earthworks and permanent vegetation removal to construct the permanent sealed vehicle entrance to the site ▪ Approximately 320 m² of earthworks and temporary vegetation removal to construct the parking areas adjacent to the culvert entrance and exit and the contractor laydown area ▪ Earthworks to construct the pipe via trenchless means (10 m vertical distance below the wetland). – At Shaft 12: ▪ Approximately 150 m² of earthworks and temporary vegetation removal to construct the access road above the culvert at Shaft 12.
45(2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland for the purpose of constructing specified infrastructure.		

² Refer Subpart 3.21 Definitions relating to wetlands and rivers of the National Policy Statement: Freshwater Management

4.2.2 Permitted activities

Temporary Activities

The wetland at 32 Mamari Road is supported by both surface water and groundwater flows across the site, whilst riverine wetlands at Shaft 8 and 12 are sustained by stream flows. The installation of the construction laydown areas within 100 m of the wetlands will include stripping topsoil, and installing geotextile and compacted GAP65. The GAP65 will provide some permeability enabling water to continue to filter into the ground. The use of silt fences along the boundary of the construction area will allow for surface water to continue to flow from the hardstand towards the wetlands. The earthworks and installation of erosion and sediment control measures within 100 m of the wetlands will therefore not alter the water level, hydrological function or extent of the wetlands. The activities therefore do not trigger the requirement for consent under Regulation 45(3) or 45(4) of the NES:F.

As outlined in Section 5.2.2 and the Groundwater and Settlement Effects Assessment provided in Appendix D, dewatering of groundwater at the break pressure chamber, Shaft 8, and Shaft 12 is not anticipated to cause any change in the hydrological inputs, water levels or hydrological function of the wetland. This activity does not trigger the requirement for consent under Regulation 45(4) of the NES:F.

Permanent activities

Permanent works at Shaft 8 include the installation of subsoil drains which divert surface water and discharge it at a point approximately 9 m from the riverine wetland (refer to Figure 3-1). As the riverine wetland is sustained by stream flows, the diversion and discharge of the surface water will not cause any change in the hydrological inputs, water levels or hydrological function of the wetland, and will not trigger the requirement for consent under Regulation 45(4) or 45(5) of the NES:F.

4.3 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NЕСS)

4.3.1 Resource consents sought

As described in Section 2.3, a DSI has been undertaken for the site (Appendix E).

This assessment determined that the NESCS applies to the works at 8 Spedding road, 32 Mamari Road, and 2A Buckley Road as the sites are assessed as HAIL sites, and no soil sampling has been completed to confirm whether the concentrations of contaminants in the soils are within background levels. A resource consent for soil disturbance will be required as a **Discretionary Activity** under the NESCS (Regulation 11).

4.3.2 Activities to which the NESCS does not apply

The land use at 8 Spedding Road is proposed to be changed from production land to commercial land use for the construction and operation of the break pressure chamber. Given the typical concentrations of contaminants associated with land previously used for horticultural use, and the change to low sensitivity commercial land use with potentially contaminated topsoil to removed, it is not considered that the change of land use is reasonably likely to harm human health. Therefore, regulation 5(6) of the NESCS does not apply to the change of use at the site.

5 Assessment of Effects on the Environment

5.1 Positive effects

The Massey Connector and Northern Interceptor are a key component of the planned wastewater network required to service existing, planned and future growth in the North West region of Auckland. Once complete, the Northern Interceptor will service up to 466,000 dwellings, whilst the Massey Connector will service 13, 000 of these dwellings from the Massey North, Whenuapai and Red Hills catchments (refer to Figure 1-1 for service catchments).

In addition, the diversion of existing and future flows originating in the North West catchment from Mangere WWTP to the Rosedale WWTP via the Northern Interceptor will free up capacity at the Mangere WWTP, which can be utilised to service intensification and growth in other parts of the city.

The Massey Connector and Northern Interceptor will therefore enable urban development opportunities in the North West region of Auckland, contributing to alleviating the housing shortage, and providing significant regional community and economic benefits.

The provision of sufficient capacity within the wastewater network to service planned growth reduces the risk of future wastewater overflows from the network. This will contribute to maintaining and improving water quality in freshwater and coastal environments, providing environmental, cultural and amenity benefits. Reducing the incidence of overflows also contributes to the maintenance of public health through reducing the risk and incidence of water borne diseases.

5.2 Groundwater and Settlement

A Groundwater and Settlement Effects Assessment has been prepared for the project by Tonkin & Taylor and is provided in Appendix D. This report considers the potential effects of groundwater diversion and dewatering during construction for each shaft site.

The trenchless construction methodologies have the capability to operate with full face support, which will restrict ingress of groundwater into the tunnel during tunnelling operations. Groundwater drawdown occurring as a result of tunnelling is therefore assessed to be negligible, and not considered further. Any open trenching undertaken between Shaft 18 and the Hobsonville pump station will meet permitted activity standards and does not require further assessment.

Groundwater dewatering and diversion during construction activities, whilst temporary, have the potential to cause settlement which may damage buildings, road surfaces and/or underground services if not managed appropriately. Other adverse effects can include the effects on water levels in nearby water bodies. These effects decrease with increasing distance from an excavation.

5.2.1 Effects on buildings and roads

The Groundwater and Settlement Effects Assessment has identified an electrical substation located at 439 Hobsonville Road, and the surface of the Upper Harbour Highway, may be affected by settlement caused by dewatering of groundwater during construction of Shaft 17. The amount of settlement experienced at each of these locations will depend on the robustness of shaft construction. In order to minimise the level of potential settlement, robust construction methods will be utilised to create a relatively watertight shaft which limits the leakage of groundwater into the shaft to just wetting of the walls. This will include carefully placing piles to ensure they overlap, and following construction, installing a permanent water-tight concrete lining around the shaft walls and base to permanently limit groundwater intrusion. With robust construction methods in place, the maximum surface ground settlement and differential settlement at 439 Hobsonville Road are estimated to be 11 mm or less and <1V:2000H respectively, whilst the estimated maximum settlement on the Upper

Harbour Highway is estimated to be 8 mm or less. Vector and Waka Kotahi have been informed of the settlement effects and provide support of the project in principle while the appropriate monitoring and contingency measures are discussed and to be agreed on (refer to Section 6 for further details)]. Further details regarding the distance of the asset from the excavation, and the estimated settlement and differential settlement at each asset for both leaky and watertight shaft scenarios, are outlined in Table 5-1 below.

Table 5-1. Summary of total settlements from excavation works at assessed assets for two scenarios, including a leaky shaft, and robustly constructed watertight shaft

Asset	Distance from edge of excavations (m)	Est. max surface ground settlement		Est. approx.. max differential surface ground settlement	
		Leaky shaft (mm)	Watertight shaft (mm)	Leaky shaft (mm)	Watertight shaft (mm)
Electrical substation at 439 Hobsonville Road	19	25	11	< 1V: 2500 H	< 1V: 2000 H
Upper Harbour Highway	21	18	8	N/A	

In addition, modelling has indicated that there may be some minor mechanical settlement at the bowling club bowling green at 1 Memorial Avenue, which is within the level of tolerance that can be readily regraded..

Effects on underground services

Several underground services are located in proximity to shaft excavation works, including water and wastewater pipes owned by Watercare, a stormwater treatment device and stormwater pipes, manholes and catchpits, a United power supply line, and a Vodafone cable. The maximum total and differential settlements across these services are assessed to be 35 mm and 1V:750H respectively. At this level of total and differential settlement, the risk of damage to underground services is assessed to be very slight.

The existing water and wastewater pipelines are owned by the applicant and effects on these are therefore not considered. As is standard practice, Watercare will engage with the remaining asset owners to manage the risks, and establish suitable controls, for each service.

5.2.2 Effects on the neighbouring water bodies and bores, and underlying aquifer

In relation to potential effects on the neighbouring water bodies and bores and the underlying aquifer, the assessment concludes the following:

- Any groundwater depletion which occurs at the streams and wetlands at the break pressure chamber, Shaft 8 and Shaft 12 as a result of dewatering is expected to be negligible, and will not detectably change the water levels or hydrological function of the wetlands, or the base flows of the streams.
- The closest recorded bore to the proposed excavations is located approximately 250 m to the south of the break pressure chamber. This is located well outside the zone of influence of the works, and as such is assessed to not be impacted by the proposed works.
- Groundwater which is not intercepted by the shafts will be diverted around the shafts and will continue in the same general direction and flow rate with no adverse effect.

5.2.3 Measures to avoid, remedy or mitigate potential adverse groundwater and settlement effects

Whilst overall any potential effects associated with groundwater dewatering is expected to be low or negligible, a Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) has been developed to monitor and manage and potential effects associated with groundwater dewatering and settlement (refer to Appendix H).

The GSMCP proposes a number of monitoring points, pins and inclinometers at the shaft retaining structures, on the ground, and at nearby structures, accompanied by groundwater level monitoring. Alarm and Alert trigger levels are proposed, with the measures to be undertaken in the event that trigger levels are exceeded outlined below.

5.2.3.1 Alert trigger levels:

The following actions will be undertaken in the event that Alert trigger levels are exceeded:

- Council will be notified in writing within one working day of the trigger level being exceeded, with details of any actions being undertaken.
- All survey monitoring marks within 25 m of the affected monitoring marks will be surveyed to confirm the extent of deformation and exceedance of the Alert trigger
- Monitoring data, as-built details and geology, will be reviewed, and compared against the assumptions made in the design analyses.
- A written report by a Chartered Professional Engineer will be submitted to Council for approval within one week of trigger level exceedance.
- If considered necessary, the monitoring frequency will be increased and / or a detailed contingency plan will be developed and submitted to Council

5.2.3.2 Alarm trigger levels:

In addition to the actions outlined above for alert trigger levels, the following actions will be undertaken in the event that Alarm trigger levels are exceeded:

- Further excavation (including tunnelling) or any other activity such as dewatering which has the potential to cause further deformations, will cease. Dewatering will not cease where this may result in the potential loss of the TBM or cause instability in an excavation.
- A written report by a Chartered Professional Engineer which provides analyses of all monitoring data and any recommendations for remedial action will be submitted to Council for approval within one week of Alarm trigger level exceedance.
- Once approved by Council the recommendations shall be implemented.
- Dewatering and/or construction may be resumed only Auckland Council has given written approval for construction to continue.

5.2.3.3 Contingency Options

If any of the monitoring trigger levels are exceeded, the following additional contingency actions may also be undertaken, depending on the exact nature of the problem:

- In the event of excavation retention deflections exceeding the trigger levels, a review of the retaining design model shall be carried out to assess the increased load in the excavation retention and existing props. Remedial actions may include installing additional props, anchors, and / or piles, forming grout curtains behind the excavation retention, and / or injecting groundwater through recharge wells.
- In the event of ground or building deformation exceeding the trigger levels, actions may include one or more of reviewing pre-construction condition surveys followed by discussions with affected parties, groundwater injection, monitoring the rate of settlement, and checking public safety is maintained
- Contingency measures for the settlement of underground services shall be established with the asset owner.

In addition, pre and post construction surveys is proposed to be carried out at the substation at 439 Hobsonville Road and 1 Memorial Park Lane, and for underground services where these are accessible and/or in accordance with service providers requirements.

5.2.4 Conclusion

Vector and Waka Kotahi have been informed of the settlement effects and provide support of the project in principle while the appropriate monitoring and contingency measures are discussed and to be agreed on.

During construction there is potential for some settlement to occur, which may impact the Upper Harbour Highway, the Vector substation at 439 Hobsonville Road and the bowling green at 1 Memorial Avenue. However, a range of monitoring measures will be implemented through the GSMCP, during and after construction. This includes pre and post construction surveys, and groundwater and settlement monitoring.

Network utilities will be engaged prior to construction to manage risks to assets and establish suitable controls for each service.

Overall, it is considered that with these measures in place, potential groundwater diversion, dewatering, and ground settlement will be appropriately managed.

5.3 Ecological effects

An Ecological Impact Assessment has been prepared for the project by Beca Ltd and is provided in Appendix C. This report assesses the construction and operational impacts of the activities on streams, wetlands, and fauna.

5.3.1 Construction effects

Discharge of sediment to wetlands and streams

Earthworks in proximity to wetlands and streams at Shaft 8 and Shaft 12 have the potential to produce sediment discharges which can reduce water quality and have adverse effects on wetland flora and aquatic ecology, including smothering organisms, reducing the abundance and diversity of macroinvertebrates, and harming fish populations.

In order to minimise the potential risks of sediment entering the wetlands and stream, erosion and sediment controls will be installed around earthworks areas in line with GD05 as described in Section 5.4 below and the Erosion and Sediment Control Plan in Appendix F. With these measures in place, impacts of discharge of sediment from earthworks adjacent to wetlands and streams on water quality and freshwater ecology are expected to be low to very low.

Temporary loss of riparian vegetation

Vegetation loss from the riparian margin of streams and wetlands can result in a loss of buffering against runoff from the surrounding environment, stream shading, organic inputs (leaf litter), and bank stability.

Approximately 2,120m² of riparian vegetation will require temporary removal to provide for construction activities. This includes removal of approximately 150 m² of native vegetation (mānuka, kānuka and karamū) from the entranceway to Shaft 8 and approximately 150 m² of native planting above the culvert adjacent to Shaft 12. The approximately 300 m² temporary loss of this native vegetation will be replaced on a 1:1 basis with similar native vegetation and/or in accordance with Waka Kotahi requirements. The remainder of riparian vegetation to be temporarily removed from the construction laydown areas at these sites consists of mainly grass and exotic ground cover including pest plants. These areas will be grassed upon completion of the works (excepting the areas which will be planted as compensation for permanent loss of vegetation removal, which are discussed further below).

Birds

Vegetation clearance may result in the disturbance of birds, particularly if nesting is occurring. Where practicable, vegetation clearance will be undertaken outside of nesting season. Where this is not practicable,

areas planned for vegetation clearance will be surveyed for the presence of bird nests before clearance works begins by a suitably qualified ecologist in accordance with the Wildlife Act 1953. If indigenous birds are found nesting, vegetation clearance in the immediate vicinity of the nest will be delayed until the residing chicks have fledged. With the mitigation measures in place, the overall level of effect to birds is considered to be very low.

Lizards

Removal of vegetation at the break pressure chamber, Shaft 8, 10, 12, and 14, has the potential to result in injury and / or mortality of any native lizards which may be present at these locations. To manage this potential risk, an initial lizard survey will be undertaken within suitable habitat areas at these sites by a suitably qualified herpetologist prior to vegetation clearance. If native lizards are found to be present, a Lizard Management Plan will be prepared and implemented. With these measures in place, the overall level of effect to lizards is low.

Bats

The clearing of trees at Shaft 8, 10, 12 and 14 may affect terrestrial fauna habitat, including potential injury or mortality of roosting long-tailed bats and damage to bat roosts if present. To manage this potential risk, an initial bat survey and tree risk roost assessment will be undertaken by an appropriately qualified ecologist prior to the commencement of works. If any bat activity is detected, a Bat Management Plan (BMP) will be developed and implemented. With these measures in place, the overall level of effect to bats is assessed as low.

5.3.2 Permanent effects

Permanent loss of riparian vegetation

Installation of the permanent accessway to shaft 8 will result in a permanent loss of approximately 330 m² of vegetation within the riparian margin of the riverine wetlands which run alongside Trig Stream and Waiarohia Stream. To mitigate this loss, an approximately 330 m² area within the riparian area of Trig Stream and / or Waiarohia Stream will be planted with compensation planting. This will increase the indigenous dominance in the local landscape, reduce the undergrowth of weedy vegetation through increased shading, and provide habitat for terrestrial native fauna. A planting plan will be provided to Council prior to construction. Once the compensation planting has established, the overall effect is assessed as very low.

5.4 Erosion and sedimentation effects

The project involves earthworks within the Sediment Control Protection Area of Waiarohia Stream, Trig Stream, and associated riverine wetlands at Shaft 8, and within the Sediment Control Protection Area of the intermittent stream at Shaft 12, and on a slope greater than 10 degrees at Shafts 10, 12, and the associated access road.

Earthworks, where uncontrolled, have the potential to result in the mobilisation of sediment that can be discharged into wetland and stream environments. This could result in potentially harmful effects on water quality, substrate composition, and aquatic life if not managed properly during construction.

5.4.1 Measures to avoid, remedy or mitigate potential adverse land disturbance effects

A draft Erosion and Sediment Control Plan (ESCP) has been prepared for this project in coordination with the contractor, and is provided in Appendix F. This will be updated by the contractor prior to commencement of construction. The proposed measures are based on best practice erosion and sediment control in Auckland as set out in Auckland Council GD05: 'Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region' and include the following:

- Whilst the contractor will endeavour to complete earthworks during the Auckland Council's earthwork season (1st October – 30th April), it is likely this project will also be undertaken over the winter months. Where works are required between 1st May – 30th September, the contractor will apply to Auckland Council for winter works approval;
- Stabilised entranceways will be installed at points where the site is accessed from public roads. The need for wheel washing facilities will be assessed by the contractor at each shaft location.
- Vegetation clearance will be limited to areas where soil disturbance will be undertaken, with as much existing ground cover being retained as possible.
- Contractor areas at each shaft site will be stabilised with a clean running surface to minimise erosion and potential dirty water runoff.
- Dust control will be managed through the use of water spray as required;
- Topsoil will be stockpiled for reuse on site, and immediately stabilised with mulch and seed. Spoil removed from tunnelling operations will be stockpiled temporarily, then removed offsite daily to an approved fill facility. The stockpile handling area will be bunded to minimise the potential generation of sediment.
- Silt fences are proposed as the primary treatment device for all sites (refer to Appendix F for details). Clean water diversions will be used to divert water away from the works sites, including use of an existing roadside swale at the break pressure chamber at 32 Mamari Road, a cleanwater bund / diversion at the upgradient slope at 27 Trig Road, and an existing stabilised stormwater outfall at Shaft 12.
- Dirty water will be treated using a dewatering treatment device, which will be set up to allow passive discharge of treated water to a nearby overland flow or watercourse, or to an established sediment retention device onsite (if constructed).

Details of proposed measures which will apply to each specific project area are detailed in Section 8 of the ESCP and illustrated in the drawings in Appendix A of the ESCP.

5.4.2 Conclusion

Overall, with the above measures in place, the works can be managed appropriately through the implementation of the ESCP.

5.5 Arboricultural effects

An Arboricultural Assessment has been prepared by The Tree Consultancy Company for the project and has been provided in Appendix B. The Arboricultural Assessment assesses tree removal from the riparian area at Shaft 8, and from the access road at 19 Westpoint Drive.

5.5.1 Shaft 8

The works at Shaft 8 require the removal of 1 protected tree at the south eastern corner of the site which is within the riparian margin of the stream, and 1 protected tree from the southern boundary which is within the riparian margin of the wetland. The trees are exotic trees which are assessed to be arboriculturally insignificant and not of a quality that would warrant retention.

The two protected trees removed from the riparian area of Shaft 8 will be replaced at a 1:1 ratio with medium grade species suitable for the streamside environment. A Planting Plan for the site will be submitted to Auckland Council prior to works commencement.

5.5.2 Access Road at 19 Westpoint Drive

As set out in Section 3, approximately 450 m² of vegetation will need to be removed from the open space zone, to enable construction of the access road to shafts 10 and 12. This includes removal of one tree which is approximately 4 m in height. The tree will be replaced with 1 large grade (45L) tree, at a location to be determined in conjunction with the Urban Forest team at Auckland Council. Given the size and age of the

tree, it is anticipated that replacement planting following the works will reach the current dimension within a relatively short time period.

5.5.3 Summary

The works will require removal of protected trees and shrubs from the riparian area of the stream and wetland, and removal of one tree from the open space zone. Protected vegetation which is removed for the project will be replaced on a 1:1 basis. Given the nature of the trees to be removed (which are arboriculturally insignificant and / or of a size and age which can be readily replaced), and the mitigation proposed, the arboricultural effects are considered to be adequately mitigated.

5.6 Contamination effects

A Detailed Site Investigation and draft Contaminated Site Management Plan (CSMP) have been prepared by Tonkin and Taylor Ltd for the project and are provided in Appendices E and I respectively.

The DSI identifies that the break pressure chamber and construction laydown area at 8 Spedding Road and 32 Mamari Road and the section of pipeline between Shaft 17 and the Hobsonville Pump Station at 2A Buckley Avenue will be located on sites where are subject to HAIL activities. No soil testing data is currently available to confirm whether the concentrations of contaminants exceed background levels at these locations. If contaminated, the disturbance of the soils at the site could affect the human health of site workers and/or future site users³ through the inhalation of dust, ingestion of soil, or dermal contact, and environmental receptors (groundwater and surface water) through leaching of contaminants and runoff.

To assess the risk of these effects occurring, further soil and groundwater investigations are proposed to be undertaken at 8 Spedding Road and 2A Buckley Road prior to commencement of works. A sampling plan and methodology for these investigations has been developed and is provided in the CSMP in Appendix I. No soil sampling is proposed to be undertaken at the construction laydown area at 32 Mamari Road as no soil will be taken offsite, and the strip and stockpile of topsoil can be managed under the standard earthwork controls and unexpected discovery protocols in the CSMP.

The draft CSMP sets out the key contamination risks across the alignment, as well as the procedures, mitigation and monitoring to be undertaken during the proposed works to minimise potential risk to human health and the environment. Some of the procedures include:

- Health and safety procedures, including requirements for all site personnel to undergo a CSMP briefing prior to commencing work, the use of PPE, and decontamination measures such as bootwashes and handwashing;
- Details of whether soil from each site should be disposed of to cleanfill or managed fill;
- Controls for spoil excavation, transport, management, such as the requirement for all soil being disposed offsite to be transported in covered trucks;
- Dust control and air monitoring measures;
- Requirements for the discharge of dewatered water
- Contingency measures for unexpected discoveries and uncontrolled discharges

The CSMP will be updated once the additional investigations at 8 Spedding Road and 2A Buckley Road have been completed.

With these measures in place it is considered that any potential contamination effects can be effectively managed and less than minor.

³ with regard to reuse of soil

5.7 Noise and vibration

A Construction Noise and Vibration Assessment has been prepared by Marshall Day Acoustics for the project and is provided in Appendix G. The Construction Noise and Vibration Assessment considers the noise and vibration generated by daytime construction activities at the contractor area and break pressure chamber at 32 Mamari Road, and daytime and night time underground tunnelling by the TBM to construct the Massey Connector gravity main. As the works to construct the Northern Interceptor are located within Designation 9377, these works do not require statutory approvals under the district provisions of the AUP:OP, and are not considered further in this report.

5.7.1 Construction noise

The assessment confirms that all construction noise generated by the relevant works will comply with the permitted standards outlined in E25.6.27 of the AUP:OP. Construction noise is therefore not considered further in this report.

5.7.2 Construction vibration

Construction vibration effects from the relevant works have been considered both in terms of building damage and amenity. Vibrations generated by activities are predicted to comply with all cosmetic damage limits for nearby receivers. No building damage is anticipated as a result of any construction related vibration.

However, the assessment identifies that there is potential for night time vibration amenity limits to be exceeded at two dwellings along the alignment, including at 6 Spedding Road, where limits would be exceeded for approximately 4 nights, and 92 Trig Road, where limits would be exceeded for approximately 1 night. The vibration levels would be noticeable and likely to disturb sleep. In order to manage the effects of the vibration on the occupants, tunnelling within 30 m of these properties will be timed to occur between 7am and 10pm only, unless prior permissions from the property occupiers are obtained on tunnelling outside these hours.

5.7.3 Construction Noise and Vibration Management Plan

Vibration mitigation measures and other best practice site management measures will be set out in a Construction Noise and Vibration Management Plan (CNVMP). This will be used to manage works on site and set out how the construction contractor interacts with the neighbouring affected parties. It will include:

- Summary of noise and vibration standards
- Summary of assessments/predictions
- General construction practices, management and mitigation that will be used for the Project
- Noise and vibration management and mitigation measures specific to activities and/or receiving environments, particularly for high noise and/or vibration activities, and all night-time works
- Monitoring and reporting requirements
- Procedures for handling complaints, and
- Procedures for review of the CNVMP throughout the works

5.7.4 Summary

In summary, compliance with the noise and vibration limits will be met for the majority of the planned construction activities for the relevant works. Potential exceedances of night time amenity vibration limits at two properties will only occur if the occupiers of these properties provide permission to Watercare to undertake works outside of the hours of 7am and 10pm. Construction vibration will be managed through the implementation of a CNVMP. Overall, it is considered that with these measures in place that potential vibration effects will be appropriately managed.

5.8 Temporary activity effects

5.8.1 Break pressure chamber site

The construction yard at the break pressure chamber site at 32 Mamari Road and 8 Spedding Road will be in place for approximately 36 months. In addition, the site will also be utilised to support the Whenuapai Package 1 works for a period of up to 2 years. Depending on when the necessary approvals are gained, the two projects may be undertaken either separately or concurrently.

A brief assessment of potential effects in relation to construction traffic associated with the use of the break pressure chamber site has been undertaken, using the Traffic Assessment prepared by Beca Ltd for Whenuapa Package 1⁴ (provided in Appendix J). The assessment considers the potential traffic effects of Whenuapai Package 2, including the possible compounding effects of both Whenuapai Package 1⁵ and 2 being undertaken concurrently.

As outlined in Section 3.3.9 it is estimated that construction activities to support Whenuapai Package 2 will result in up to 12 truck movements at the site per day, or 1-2 truck movements per hour, during peak construction periods. The trucks will largely travel on routes which are different to those of Package 1 truck movements. Overall, the compounding effects of the works on network capacity are assessed to be negligible, including if the work is undertaken concurrently with the works for Whenuapai Package 1.

Appropriate vehicle tracking is not achieved for semi-trailers and truck & trailers at the intersections of Spedding Road, Mamari Road and Trig Road. In order to mitigate this, the intersection will be widened to provide for sufficient turning space. Alternatively, smaller vehicles will be used, or vehicles will be re-routed.

Contractor carparking will be provided onsite for 10 light vehicles (refer to Section 3.3.2.2 and



Figure 3-4 for further details).

⁴ Whenuapai Redhills: Package 1 Project – Traffic Impact Assessment Report

⁵ BUN60411512

Due to the rural location of the site there is minimal pedestrian and cycling activity on the roads surrounding the break pressure chamber.

5.8.2 Accessway to shafts 10 and 12

The accessway to shafts 10 and 12 will be in place for up to 36 months and will support 20 parking spaces in total (10 at each site). As the accessway does not meet minimum width requirements for 2-way traffic, the access layout provides for one-way circulation, with the vehicle access at 19 Westpoint Drive providing for vehicle entrance only, and the vehicle access at 18 Westpoint Drive providing for vehicle exit only (or vice versa).

5.8.3 Measures to avoid, remedy or mitigate potential adverse traffic effects

Construction traffic is proposed to be managed through the implementation of a CTMP. The CTMP set out the measures required to manage any potential traffic effects during construction and will be prepared in accordance with the Council's requirements for traffic management plans or CTMPs (as applicable) and the Waka Kotahi Code of Practice for Temporary Traffic Management.

5.8.4 Conclusion

Overall, the compounding effects of the works on network capacity are assessed to be negligible, including if the work is undertaken concurrently with the works for Whenuapai Package 1. Any potential effects will be adequately managed through the mitigation measures proposed and the implementation of the CTMP.

6 Consultation and Engagement

6.1 Mana Whenua

Watercare has an established process for engaging with mana whenua on projects and works within the Auckland region. This process includes early notification of works to be undertaken by Watercare which, do or are likely to, require resource consent.

Watercare provide a "Kaitiaki Managers Projects List" on a monthly basis to nominated representatives of all 19 Mana Whenua in the Auckland Council area being: Ngāi Tai Ki Tāmaki, Ngāti Maru, Ngāti Pāoa, Ngāti Rehua Ngātiwai ki Aotea, Ngāti Tamaoho, Ngāti Tamatera Ngāti Te Ata, Ngāti Wai, Ngāti Whanaunga, Ngāti Whātua Ōrākei, Te Ahiwaru, Te Ākitai, Te Patukirikiri, Te Uri o Hau, Waikato Tainui, Te Kawerau ā Maki, Ngāti Whātua o Kaipara, Ngāti Manuhiri, Te Rūnanga o Ngāti Whātua.

A brief summary of each project is included in the list. Mana Whenua are invited to indicate which projects they have an interest in. Further information on the identified project or projects is then provided to those parties, followed by further engagement depending on the responses received.

The project was introduced on Watercare's Kaitiaki Managers Projects List in December 2022. To date, Te Rūnanga o Ngāti Whatua has registered their interest to be engaged on the Project. No specific concerns have been raised and Watercare is keeping Te Akitai Waiohū updated as the Project progresses.

Engagement with Mana Whenua partners is ongoing and will continue through the Project development and delivery phases. Feedback received from Mana Whenua will be provided to Council either directly or at their request.

6.2 New Zealand Defence Force

The break pressure chamber and associated construction laydown area at 8 Spedding Road and 32 Mamari Road are located within Designation 4311, held by Minister of Defence, with land use at the site subject to New Zealand Defence Force (NZDF) approval (refer to Drawing 9B-2-6 of Designation 4311).

The construction and operation of the break pressure chamber are being authorised separately, under the Notice of Requirement – Whenuapai & Redhills Wastewater Scheme lodged under Whenuapai Package 1.

However, Package 2 (i.e. this Project) includes the installation of the Massey Connector, requiring construction of the receiving shaft at the site to allow the removal of the TBM, and the use of 32 Mamari Road as a construction area.

The existing designation held by New Zealand Defence Force imposes restrictions in relation to the Obstacle limitation Surface. It is anticipated that a number of construction activities will temporarily breach the OLS level.

Watercare has consulted with NZDF regarding the land use of the site (for both this Project and for Package 1), and agreed upon the following measures:

- No construction which exceeds the level of the designated OLS will be undertaken at 8 Spedding Road without the written approval of NZDF;
- At least 20 working days prior to any construction activity occurring at 8 Spedding Road or 32 Mamari Road, a Communications Plan will be prepared in draft and provided to NZDF for comment, acceptance, finalisation and implementation.

Communications with NZDF are provided in Appendix K, with proposed conditions agreed with NZDF for both Whenuapai Package 1 and 2 provided in Appendix L. Requiring Authority approval under s176(b) of the RMA will be sought from the Minister of Defence prior to works being undertaken within the designation.

6.3 Auckland Council Community Facilities

Auckland Council Community Facilities is responsible for providing landowner approval for works in Auckland's parks and reserves.

Consultation with Auckland Council Community Facilities is ongoing. Tree Asset Owner Approval for the removal of trees has been granted (refer to Appendix K). Landowner Approval for the works will be obtained prior to works commencing.

6.4 Waka Kotahi

Watercare has engaged with Waka Kotahi regarding the project over a number of years (refer to records of communication in Appendix K). Detailed information on the proposed works, including detailed design drawings, construction methodology, Groundwater and Settlement Effects Assessment, and GSMCP were provided to Waka Kotahi on 21 July 2023. Engagement with Waka Kotahi is ongoing, with Waka Kotahi providing support to the project in principle while the appropriate monitoring and contingency measures are discussed and to be agreed on.

Both Watercare and Waka Kotahi hold designations over the Upper Harbour Highway motorway shoulder. As the Waka Kotahi designation has primacy, Watercare will seek requiring authority approval from Waka Kotahi under Section 177 of the RMA prior to construction of the pipeline.

6.5 Vector

Both Watercare and Vector hold designations over the substation site at 439 Hobsonville Road. As the Watercare designation has primacy, Vector were required to seek requiring authority approval from Watercare under Section 177 of the RMA in order to construct the substation at the site. As part of gaining this agreement, Watercare and Vector signed a Development Agreement dated 6 September 2017 and provided in Appendix K.

In summary, the Development Agreement outlined that Watercare would install the pipeline in the vicinity of the proposed substation site at 439 Hobsonville Road after the substation was constructed, and required

Vector to design the substation to be resilient to agreed settlement parameters. Vector also agreed to the installation of the pipeline subject to the terms of the agreement, and agreed to not lodge an objection or submission in opposition to, or withhold consent to, any application by Watercare for any resource consent required in relation to the pipeline (refer to Section 4 of the Development Agreement in Appendix K).

As part of the Development Agreement, Watercare must provide Vector with information regarding the construction of the pipeline, and Vector may provide Watercare with reasonable conditions applying to works undertaken in the immediate vicinity of Vector assets at the site. Watercare provided Vector with information regarding the project and anticipated effects on 24 July 2023 (refer to Appendix K). Vector has agreed to review the Watercare designs to determine the suitability of the pipeline design based on the design and construction of the substation.

6.6 Hobsonville Bowling Club

Watercare is engaging with the bowling club regarding works at 1 Memorial Avenue given that tunnelling will occur underneath the property. Records of communication with the Hobsonville Bowling Club are provided in Appendix K.

6.7 Other stakeholders

Watercare has visited the properties at 6 Spedding Road and 92 Trig Road to discuss the construction project and associated impacts with the property owners and occupiers. No one was available at our visit on 22 November 2022 and January 2023. Letters were dropped on both occasions and no response has been received.

The property at 92 Trig Road is owned by Auckland Council. Landowner approval for the works has been submitted to Council Land Advisory team on 20 July 2023. The Upper Harbour Local Board was briefed of the proposed tunnelling work and provided their support on the project. A decision is expected in due course.

7 Notification Assessment

Section 95A to 95F of the RMA sets out a stepped process for determining whether an application for resource consent should be publicly or limited notified. While it is noted that the decision on notification sits solely with Council, the relevant elements of these steps are summarised below and are intended to guide Council in its notification assessment.

7.1 Concerning public notification as set out in Section 95A:

The application does not meet the criteria in Section 95A(3) that would otherwise require mandatory public notification, specifically:

- The applicant does not request this application be publicly notified (95A(3)(a)).
- The provisions of Section 95C are not relevant at this stage (95A(3)(b)).
- This application does not relate to exchange of recreation reserve land(95A(3)(c)).

In relation to Section 95A(4) the application is not precluded from public notification in accordance with the matters identified in Section 95A(5).

In relation to Section 95A(7) there are no relevant rules that require the application to be publicly notified. The AEE concludes that the proposed works are likely to have adverse effects that are less than minor for the following reasons:

- The construction works will be temporary in nature.
- Groundwater and settlement effects from dewatering can be appropriately managed through the implementation of a GSMCP.
- Erosion and sediment control measures will be installed in general accordance with GD05 to minimise potential for erosion or sediment entering the streams and wetlands present within the project area.
- Effects on arboriculture, streams and wetlands at Shaft 8 and Shaft 12 will be temporary and able to be mitigated and managed through reinstatement and replanting following completion of the works.
- Any potential vibration exceedances during construction will be temporary. Works within 30 m slant distance of 6 Spedding Road and 92 Trig Road will be scheduled to occur between the hours of 7am and 10pm only, unless prior permission from affected occupiers of those two properties is given for works to occur outside of those hours.

Potential adverse effects will be avoided, remedied or mitigated through the methods outlined in Section 5 of this AEE report.

In relation to Section 95A(9) there are not considered to be any special circumstances existing that warrant the application being publicly notified.

7.2 Concerning limited notification as set out in Section 95B:

- There are no protected customary rights or customary marine title groups affected by the work (Section 95B(2)).
- The proposed activity is not on or adjacent to, or may affect, land that is the subject of a statutory acknowledgment (section 95B(3)).
- Limited notification is not precluded pursuant to the criteria set out in section 95B(6).
- The application does not involve a boundary activity or prescribed activity in respect of section 95B(7).
- Notwithstanding the effects on assets owned by Vector and Waka Kotahi, which are best determined by the respective asset owners, the adverse effects of the proposal, including on any potentially affected persons and adjoining properties, have been assessed in the AEE and accompanying technical reports as being less than minor. Vector and Waka Kotahi have been informed of the settlement effects and

provide support of the project in principle while the appropriate monitoring and contingency measures are discussed and to be agreed on (section 95E(3)(a)).

- There are no special circumstances in relation to the application that warrant notification of the application to any other persons (section 95B(10)).

8 Statutory Assessment

This section provides an analysis of the project against the relevant legislative framework and concludes by providing an assessment against Part 2 of the RMA.

8.1 Section 104 – Consideration of applications

Section 104 of the RMA sets out the matters which a consent authority must have regard to, subject to Part 2 of the RMA, when considering an application for resource consent. With respect to this project, the relevant parts of section 104 include:

- Any actual and potential effects on the environment of allowing the activity (104(1)(a));
- Any relevant provisions of a national environmental standard, national policy statement, regional policy statements, and plans (104(1)(b)); and
- Any other matter the consent authority considers relevant and reasonably necessary to determine the application (104(1)(c)).

The actual and potential effects on the environment of allowing the activity are set out in Section 5 of this report. In summary, the potential effects relate primarily to groundwater effects, ecological and arboricultural effects, erosion and sedimentation, contamination, and construction vibration. Mitigation and management measures are proposed such that any adverse effects can be avoided, mitigated or managed appropriately.

Section 8.2 assess the project in relation to the relevant provisions of national, regional policy statements and plans (under Section 104(1)(b)).

There are not considered to be any other matters of relevance and reasonably necessary to determine the application (Section 104(1)(c)).

8.2 Section 104(1)(b) – Relevant planning documents

8.2.1 National Policy Statement for Freshwater Management 2020 (NPS:FM)

The overarching concept of the NPS:FM is Te Mana o te Wai, which refers to the fundamental importance of water, and recognises that protecting the health of freshwater protects the health and well-being of the environment. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community. In line with Te Mana o te Wai, the NPS:FM has the objective of ensuring that natural and physical resources are managed in a way that prioritises the health of water bodies first, the health needs of people second and the ability of people and communities to provide for their well-being third. Policies considered most relevant to the project include:

- Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai;
- Policy 6: There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted;
- Policy 7: The loss of river extent and values is avoided to the extent practicable.
- Policy 15: Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

The effects management hierarchy which is outlined in the NPS:FM requires that the adverse effects on wetlands and rivers are avoided, their values protected, and their restoration is promoted. There are, however, some exceptions to this which includes, amongst other exceptions, where the regional council is satisfied that:

- i. The activity is necessary for the purpose of the construction or upgrade of specified infrastructure; and
- ii. The specified infrastructure will provide significant national or regional benefits; and

- iii. There is a functional need for the specified infrastructure in that location; and
- iv. The effects of the activity are managed through applying the effects management hierarchy;

Comment:

The proposed works are specified infrastructure in accordance with the definitions set out in the NPS:F (refer Section 4.2.1 for further details). As set out in Section 3.3.6, the proposed works will require approximately 540 m² of vegetation removal and earthworks within 10 m of the riverine wetlands at Shaft 8 in order to establish the temporary and permanent accessway into the site, provide contractor parking, and undertake construction work, and in order to provide access to the site at Shaft 12. Approximately 60 m² of this vegetation removal will be permanent.

In response to the matters set out in the NPS:F (detailed above) the following summarises how and why the proposed works provide a regional benefit, have functional need as they can only occur within the environment in which they are located, and have applied the effects management hierarchy as follows:

Regional benefit:

Overall the Project will have regional benefit. As set out in Section 1.2 and 5.1 of the AEE, the reason for the Project is to provide the necessary infrastructure to unlock land for residential, business and industrial use in the North West region, as well as in the wider region. By conveying wastewater from the North West region of Auckland to the Rosedale WWTP in Albany, this will also free up capacity at the Mangere WWTP bringing regional benefits.

Functional need:

Functional need is defined in the NPS:FM as “the need for a proposal or activity to traverse, locate or operate in a particular environment because the activity can only occur in that environment”.

Environment is broadly defined in s2 of the Resource Management Act to include:

- a) Ecosystems and their constituent parts, including people and communities; and
- b) All natural and physical resources; and
- c) Amenity values; and
- d) the social, economic, aesthetic, and cultural conditions which affect the matters stated in paragraphs (a) to (c) or which are affected by those matters.”

The Project, and specifically the Northern Interceptor pipeline, Shaft 8 and Shaft 12 (which are within proximity to the wetlands), must be located in the particular environment in which they are proposed as follows:

- Watercare has an existing designation in place which provides for the Northern Interceptor pipeline. The pipeline was planned to be developed in a staged manner. Construction of Stage 1 of the project, which includes a pipeline between Hobsonville Pump Station and Rosedale WWTP, is currently under construction and due for completion in October 2023. Stage 2 Phase 1 of the pipeline (this Project) is therefore required to be located in an environment which is appropriately central to the North West catchments which require servicing (shown in Figure 1-1), and which enables a continuous connection to be provided between the Concourse and the beginning of Stage 1 of the project at Hobsonville pump station.
- In order to construct the pipeline, and allow for ongoing operation and maintenance, shafts are required to be located at regular intervals along the alignment. The location at 27 Trig Road and in the motorway shoulder adjacent to 18 Westpoint Drive were selected as appropriate shaft sites for the following reasons:

- Shaft 8 is located immediately adjacent to the motorway corridor, whilst Shaft 12 is within the motorway corridor. This provides for the efficient use of natural and physical resources.
- The shafts are proposed to be in low density environments. The nearest dwelling to shaft 8 is located approximately 100 m to the south west of the shaft, and a total of 3 dwellings within a 250 m radius. The nearest dwelling to Shaft 12 is approximately 250 m away. Locating the pipe in an environment which is currently rural and / or alongside a motorway minimises the effects of construction and operation of the pipe on the community, including minimising the amenity effects of noise and vibration during construction, and dewatering settlement on surrounding structures which would likely occur in a more urbanised environment.
- The shaft is located on land which is publicly owned, which minimises the impacts of the project on private landowners.
- The shaft is located in an environment where the potential ecological effects of the activity can be appropriately managed. Whilst there is a riverine wetland within 10 m of the accessway to both sites the riverine wetlands (and particularly Shaft 8) are dominated by species which are considered pests under the Auckland Regional Council Pest Management Strategy. Any adverse effects on the riverine wetlands because of the proposed works are assessed to be low to very low.

Locating the shaft in an alternative location would require lengthening of the pipe, and as a result having greater environmental effects. *Application of the effects management hierarchy:*

Given the functional need for the proposed works, the effects management hierarchy has been applied. Adverse effects on the values of the streams and wetlands will be avoided to the extent practicable and minimised through the use of erosion and sediment control measures around the works areas, which will minimise the levels of sediment entering the freshwater system.

Vegetation removal has been avoided to the extent practicable through locating the construction laydown area at Shaft 8 at or greater than 10 m from the wetland as much as possible whilst recognising the size constraints of the site. Removal of vegetation and earthworks to construct the temporary and permanent access was unable to be avoided due to the location of the wetland in relation to the site accessway, and the size of the vehicles requiring access to the site. It was not practicable to locate the parking area greater than 10 m from the wetland, as parking is required for contractors to access the site, and for emergency vehicles.

The approximately 330 m² of permanent vegetation removal from the riparian yard⁶ of the riverine wetland at Shaft 8 will be compensated through an equal area of native riparian planting at the same site, improving the quality of the vegetation which is currently dominated by exotic and pest species. The compensation planting will enhance shading of the stream and retain the sediment buffering capacity, protecting the values of the stream and wetland. Native areas will be replanted, whilst the balance of the site which was previously dominated by grasses, exotic and pest vegetation will be regressed. There are not considered to be residual adverse effects from the vegetation removal.

Summary:

Overall, the project provides a significant regional benefit, has a functional need to operate in the environment in which it is located, and has applied the effects management hierarchy to avoid, minimise, and mitigate the adverse effects of the works on the streams and wetlands in the surrounding environment. It is therefore considered that the works have been designed to provide for the wellbeing of the community, in a way that is consistent with the policies set out in the NPS:FM.

⁶ within 20 m of the wetland, as defined in the AUP:OP

8.2.2 National Policy Statement for Indigenous Biodiversity (NPS:IB)

The NPS:IB applies to indigenous biodiversity in the terrestrial environment, and recognises that the health and wellbeing of people and communities are dependent of the health and wellbeing of indigenous biodiversity, and in return people have a responsibility to care for it and nurture it. The overall objective of the NPS:IB is to maintain indigenous biodiversity so that there is at least no overall loss in indigenous biodiversity, including by protecting and restoring indigenous biodiversity as necessary to achieve the overall maintenance of indigenous biodiversity, whilst providing for the social, economic and cultural wellbeing of people and communities now and in the future. The policies which are considered most relevant to the application include:

- Policy 3: A precautionary approach is adopted when considering adverse effects on indigenous biodiversity;
- Policy 8: The importance of maintaining indigenous biodiversity outside SNAs is recognised and provided for;
- Policy 10: Activities that contribute to New Zealand's social, economic, cultural, and environmental wellbeing are recognised and provided for as set out in this National Policy Statement; and
- Policy 14: Increased indigenous vegetation cover is promoted in both urban and nonurban environments.

Comment:

Initial lizard surveys, bat surveys, and bat tree risk roost assessments will be undertaken at works sites where it is considered that lizards and / or bats may be present. Where lizards or bats are detected at the site, an LMP and / or BMP will be developed and implemented. Native planting which is removed for the works at Shaft 8 and 12 will be replaced, whilst at Shaft 8, an area of approximately 330 m² of vegetation dominated by exotic and pest vegetation will be replaced with appropriate native species within the riparian margin of streams and wetlands. This will increase the indigenous dominance in the local landscape, reduce the undergrowth of weedy vegetation through increased shading, and provide habitat for terrestrial native fauna. As outlined in the Ecological Impact Assessment provided in Appendix C, there are no areas within the works locations which are considered to meet the criteria of Significant Natural Areas.

Overall, this approach provides a suitably precautionary approach to indigenous fauna management, and will provide for the maintenance and restoration of indigenous biodiversity values across the works areas.

8.2.3 Auckland Regional Policy Statement

The Auckland Regional Policy Statement (ARPS) (Chapter B of the AUP:OP) sets out a high order overarching policy framework with more specific policies, objectives and implementation methods than those contained in sections of the AUP:OP for managing the use, development and protection of the natural and physical environment of the Auckland Region.

When considering an application for resource consent, a consent authority must, subject to Section 104 of the Act, consider the relevant provisions of the ARPS. The relevant provisions of the ARPS are outlined below.

Chapter B3 Ngā pūnaha hanganga, kawekawe me ngā pūngao - Infrastructure, transport and energy

Chapter B3 highlights that the quality of the environment and the well-being of people and communities are affected by choices about the management of, and investment in infrastructure. Objective B3.2.1(2) requires the benefits of infrastructure are recognised, including providing essential services for the functioning of communities, businesses, and industries, enabling economic growth, providing for public health, safety and well-being of people and communities, and protecting the quality of the natural environment. Objective B3.2.1(3), and Policies B3.2.2(1), (6) require development of infrastructure to be enabled, including in areas with natural resources, whilst avoiding where practicable, or otherwise remedying, mitigating, and managing

adverse effects on the quality of the environment. Policy B3.2.2(3) provides for the locational requirements of infrastructure, in particular the functional need to be located in areas with natural and physical resources that have been scheduled in the AUP:OP.

Comment:

The project involves increasing the capacity of the wastewater network, which will provide for wastewater from the growth areas in the North West region of Auckland to be delivered to Rosedale WWTP, and free up capacity at the Manukau WWTP to receive increased inflows from increased development across the wider Auckland region. This provides an essential service for the functioning of communities, businesses and industries. Adverse effects from the project will be avoided, mitigated and managed through the measures outlined in Section 5 of this report.

Chapter B7 Toitū te whenua, toitū te taiao – Natural resources

Chapter B7 identifies that pressures on natural resources need to be managed for environmental, social, economic and cultural wellbeing. Objective B7.3.1(3) and Policy B7.3.2(5) seeks that use and development of land is managed to maintain or where appropriate enhance freshwater systems, and the existing riparian vegetation located on the margins of streams and wetlands. Objective B7.4.1 requires that quality of freshwater to be progressively improved over time where it is degraded, whilst Policy B7.4.2(8) requires use and development to minimise and manage the discharge of sediment into freshwater by requiring land disturbing activities to use industry best practice and standards appropriate to the nature and scale of the land disturbing activity, and the sensitivity of the receiving environment.

Comment:

Riparian planting will be undertaken at Shaft 8 and Shaft 12 to offset permanent vegetation removal and to replace native vegetation which has been removed from the site. This will maintain and enhance the values of the riparian vegetation at the site. The discharge of sediment into freshwater systems will be minimised and managed through implementation of erosion and sediment devices which are consistent with GD05.

Chapter B10. Ngā tūpono ki te taiao - Environmental risk

Chapter B10 recognises that contamination of soils or groundwater from human activity, and that the improper storage of hazardous substances, can impact people's health and safety and cause environmental harm. Objective B10.4.1(1) seeks that human health and the quality of air, land and water resources are protected by the identification, management and remediation of land that is contaminated. Policy B10.4.2(1) and (2) seek to identify land that is or may be contaminated, whilst Policy B10.4.2(3) seeks to manage land or remediate land where development is proposed.

Comment:

DSI and CSMP have been completed for the site which identifies the levels of contamination of soil and groundwater at a number of sites within the project works area, and additional sampling which is requiring to identify contaminant levels at the remaining sites prior to construction. The CSMP outlines specifically how the site will be managed during disturbance of soils, and will be updated once further sampling at the remaining sites has been undertaken. The CSMP has been prepared in line with best practice, to manage potential risks to human health and the environment during construction.

8.2.4 Auckland Unitary Plan: Operative in Part

Chapter E2 Water quantity, allocation and use

The objectives and policies of Chapter E7 Taking, using, damming and diversion of water and drilling are contained within Chapter E2 Water quantity, allocation and use. Policy E2.3(7) requires the take of

groundwater from any aquifer demonstrates that ground settlement that may cause distress resulting from the take is avoided, remedied or mitigated.

Comment:

As outlined in Section 5.2, any potential adverse effects from groundwater dewatering and diversion is limited. The potential for adverse effects on underground services is considered to be low.

Notwithstanding this, Watercare will work with the asset owners of the property, Upper Harbour Highway, and underground services which are in proximity to the works, to establish suitable controls, and manage the risks to each asset and service. In addition, a GSMCP has been prepared which contains measures to monitor groundwater drawdown, surface settlement, and building settlement, with Alert and Alarm levels and suitable contingency actions. The project is therefore considered to be consistent with the objectives and policies of Chapter E2.

Chapter E11 & E12 – Regional and district earthworks

The objectives and policies for Chapter E26.5 Network utilities and electricity generation – Earthworks all zones and roads - regional are contained within Chapter E11 Land disturbance – Regional.

Chapter 11 recognises that land disturbance is an essential prerequisite for the construction of infrastructure, and that the adverse effects of land disturbance can be reduced through the application of best practice land management techniques. Objectives E11.2(1), E11.2(2), and E12.3(1) seek that land disturbance is undertaken in a manner that avoids, remedies or mitigates adverse effects on the environment, and protects the safety of people. Policies E11.3(4) and E12.3(3) provide for land disturbance necessary for activities undertaken to provide for the needs of people and communities. Policies E11.3(2) and E12.3(2) seek to manage disturbance to reduce adverse effects, including controlling the amount of land being disturbed at any one time. Policies E11.3(6) and E12.3(6) requires that earthworks are designed and undertaken in a manner that ensures the stability and safety of surrounding land. Policy E11.3(7) requires land disturbance that will likely result in the discharge of sediment laden water to a surface body to demonstrate sediment discharge has been minimised, and adverse effects avoided, to the extent practicable.

Comment:

Any land disturbance will be undertaken in accordance with the Erosion and Sediment Control Plan (Appendix F), which sets out best practice erosion and sediment control measures to be followed during construction and has been prepared in accordance with GD05. Works will be progressively closed and stabilised to minimise the amount of earthworks open at any one time. Excavations will be appropriately supported, including the use of secant piled shafts for the break pressure chamber and Shafts 8 – 17, and secant piles, sheet piles, or other similar support methods for Shafts 18 and 19.

In addition, a Construction Traffic Management Plan will be provided as part of the Outline Plan for works within Designation 9377, which will provide management of any effects of the activities on the road network.

Chapter E15 – Vegetation management and biodiversity (trees in riparian areas)

The objectives and policies for Chapter E26.3 Network utilities and electricity generation – Vegetation management in riparian areas are contained within Chapter E15 Vegetation management and biodiversity. Chapter E15 recognises vegetation, including vegetation in riparian areas, provides a range of ecosystem services. Objective E15.2(1), Policy E15.3(1), and Policy E15.3(2) seek to protect vegetation in riparian margins and wetlands to maintain ecosystem services and indigenous biological diversity values, whilst providing for appropriate development. Objective E15.2(2) seeks to restore and enhance indigenous biodiversity in ecologically degraded areas or where development is occurring. Policy E15.3(7) seeks to manage adverse effects from developing infrastructure, recognising that it is not always practicable to locate or design infrastructure to avoid areas with indigenous biodiversity values.

Comment:

The project works require removal of 2 protected trees and a combined area of approximately 2,450 m² of vegetation from the riparian area of Shafts 8 and 12. The trees have been described as arboriculturally insignificant. The trees and approximately 300 m² of native vegetation to be removed from the sites will be replaced on a 1:1 basis. Planting of a further area of 330 m² of native species to offset the permanent loss of predominantly exotic, grass and pest species from shaft 8 will provide the opportunity to enhance overall indigenous biodiversity values at the sites.

Chapter E25 – Noise and Vibration

Chapter E25 seeks to manage the impacts of noise and vibration on sensitive receivers whilst allowing for construction activities to take place in a controlled and sensible manner. Objective E25.2(1) requires that people are protected from unreasonable levels of noise and vibration, whilst Objective E25.2(4) and Policies E25.3(2) and E25.3(10) seeks that construction activities that cannot meet these standards are enabled, whilst avoiding, remedying or mitigating adverse effects where practicable.

Comment:

The proposal for the Massey Connector works which are outside of the designation has sought to minimise adverse construction vibration effects through mitigation measures and the implementation of a CNVMP, which is considered the best practicable option for the management of vibration arising from construction activities. Works which occur within 30 m of two properties will be scheduled to occur during daytime hours only, or night time hours only in the event that written approval for the works is provided by the affected parties. Overall, the proposal is consistent with the objectives and policies of Chapter E25.

Chapter E26 – Infrastructure

Infrastructure is critical to the social, economic, and cultural well-being of people and communities and the quality of the environment. This section provides a framework for the construction of infrastructure. Objectives E26.2.1(3) - (5) and (9), and Policies E26.2.2(1) – (6) seek to enable development of infrastructure to provide for people and communities, public health and safety, the functioning of businesses, economic growth, and growth and development, whilst avoiding, remedying or mitigating adverse effects. When providing for development of infrastructure, Policy E26.2.2(2) directs decision makers to recognise the functional and operational needs, location, route and design needs and constraints, the complexity and interconnectedness of infrastructure services, and the role infrastructure plays in servicing existing, consented and planned development.

Comment:

As outlined above, the project involves development of the wastewater network between the proposed break pressure chamber at 8 Spedding Road in Whenuapai, and the Hobsonville Pump Station in Hobsonville. The scheme will enable the conveyance of wastewater from the North West region of Auckland to the Rosedale WWTP in Albany, whilst also freeing up capacity at the Mangere WWTP to take additional flows from the additional developing occurring in central, east and south Auckland. Provision of additional wastewater capacity in the network is essential for enabling increased development of land for residential, business and industrial use across the region.

The route and locations of the project components have been determined given the engineering requirements, including site topography and catchment configuration, to integrate with the existing infrastructure corridor alongside Upper Harbour Highway, and to utilise public land as required by the conditions of Designation 9377.

Chapter E30 – Contaminated Land

Chapter E30 seeks to manage the effects of the discharge of contaminants from land which contains elevated levels of contaminants. Objective E30.2(1) and Policy E30.3(2) seeks that the discharge of contaminants from contaminated land into air, or into water, or onto or into land are managed to protect the environment and human health and to enable land to be used for suitable activities now and in the future.

Comment:

The DSI has identified and recorded the levels of contaminants in soil and groundwater along the alignment, with further testing proposed to be undertaken at additional potentially contaminated sites prior to works commencing. A CSMP has been proposed which contains best practice contaminated land measures to avoid significant adverse effects on ecological values, water quality, and human health. The CSMP will be updated once further testing has been undertaken at the remaining potentially contaminated sites.

Chapter E40 – Temporary activities

E40 recognises that temporary activities contribute to the social, cultural and economic wellbeing of communities, whilst acknowledging that these activities may have adverse effects. Objective E40.2(2) seeks for temporary activities to be located and managed to mitigate adverse effects on amenity values, communities and the natural environment. Policy E40.3(3) seeks to control the traffic generated by a temporary activity so that it does not detract from the capacity of the road to safely and efficiently cater for motor vehicles, pedestrians and cyclists, and the wellbeing of residents and reasonable functioning of businesses on surrounding sites.

Comment:

Any potential effects from traffic generated by the temporary construction laydown area at the break pressure chamber will be managed through the preparation of a CTMP. Due to the rural location of the site there is minimal pedestrian and cycling activity on the surrounding roads. Overall, the proposal is consistent with the objectives and policies of Chapter E40.

8.3 Part 2 – Purpose and Principles

The Purpose of the RMA, set out in Section 5, is to promote the sustainable management of natural and physical resources, which includes enabling *“people and communities to provide for their social, economic, and cultural wellbeing.”* This must be achieved in the context of Section 5(2), in particular the responsibility of (b) for *“safeguarding the life-supporting capacity of air, water, soil and ecosystems”* and (c) for *“avoiding, remedying, or mitigating any adverse effects of activities on the environment.”*

The broader principles of the RMA are set out in Sections 6 – 8 of the RMA. Matters of particular relevance to this application include:

Section 7(b) – *the efficient use and development of natural and physical resources*

Section 8 – *take into account the principles of the Treaty of Waitangi*

It is considered that the project will achieve sustainable management of natural and physical resources and therefore be consistent with Part 2 of the RMA for the following reasons:

- The project will enable the provision of appropriate wastewater services to the North West region of Auckland, which will enable the community to continue to provide for their social, economic and cultural wellbeing.
- Adverse effects on the environment from the construction of the project have been carefully considered, will be avoided where possible, with other adverse effects being remedied or mitigated so that adverse effects on the environment are appropriately managed.

- The provision of wastewater infrastructure which provides capacity to receive wastewater flows from planned development, and in this way reduce the risk of future network overflow of untreated wastewater into the environment.
- The efficient use of existing infrastructure corridors and public land.
- Mana Whenua have been engaged on the project as outlined in Section 6 of this AEE report.

9 Conclusion

This AEE report has been prepared on behalf of Watercare to support the resource consent application for the installation of a break pressure chamber at 8 Spedding Road, in Whenuapai, and wastewater pipelines from the break pressure chamber to the existing Hobsonville Pump station at 2A Buckley Road in Hobsonville. Installing this infrastructure will provide sufficient capacity in the wastewater network to service planned growth in the North West region of Auckland, whilst freeing up capacity at the Mangere WWTP to service growth in the central, east and south regions of Auckland.

An assessment of effects on the environment has been undertaken for the project and this has concluded that any adverse effects from the project will be avoided, mitigated or remedied. This includes the use of a GSMCP to monitor and manage the effects of groundwater settlement, erosion and sediment control measures to reduce the potential for discharge of sediment into the stream and wetland environment, replacement planting of native plants and areas of permanent vegetation loss in riparian areas, a Contaminated Site Management Plan to the risks of contaminated soils, and a CNVMP to manage the effects of noise and vibration.

A statutory assessment has been undertaken that demonstrates that the proposal is consistent with the relevant provisions of the RMA, the NES:F, NPS:IB, and the AUP:OP. In addition, Watercare has engaged with interested Mana Whenua groups and other stakeholders and potentially affected parties on the project and will continue to engage with these groups through detailed design and construction.

Overall, the works will have significant benefits for Auckland through the provision of safe and efficient wastewater services and enabling further urban development across the region, whilst minimising adverse environmental effects, with any potential adverse effects temporary and able to be appropriately mitigated or managed.



Appendix A – Drawings

B

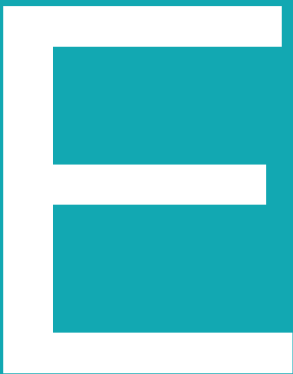
Appendix B – Arboricultural Assessment (The Tree Consultancy Company)



Appendix C – Ecological Impact Assessment (Beca Ltd)

D

Appendix D – Groundwater and Settlement Effects Assessment (Tonkin & Taylor Ltd)



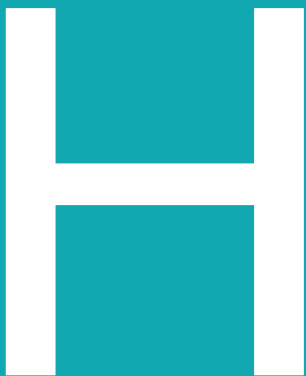
Appendix E – Ground Contamination Detailed Site Investigation (Tonkin & Taylor Ltd)



Appendix F – Erosion and Sediment Control Plan (Beca Ltd)



Appendix G – Noise and Vibration Assessment



Appendix H – Groundwater and Settlement Monitoring and Contingency
Plan (Tonkin & Taylor Ltd)

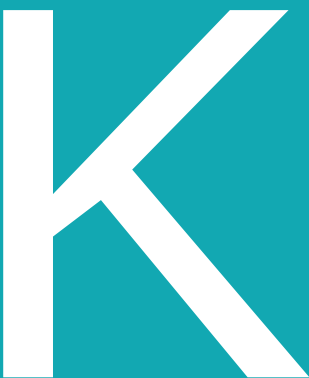


Appendix I – Contaminated Site Management Plan (Tonkin & Taylor Ltd)

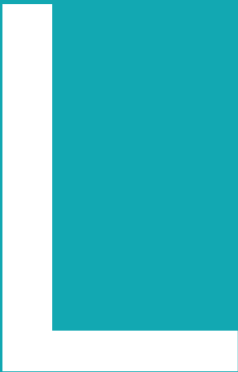


J

Appendix J – Traffic Assessment



Appendix K – Records of Engagement



Appendix L – Proposed Conditions



M

Appendix M – Records of Title