NZ TRANSPORT AGENCY
WAKA KOTAHI

Roads of national significance

16 20

Western Ring Route – Waterview Connection

Construction Environmental Management Plan

Beca

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Contents

1. Background 1
1.1 Introduction 1
1.2 Purpose and Application 3
1.3 Project Description 4
1.4 Environmental Policy 11
2. Social and Environmental Management 13
2.1 Construction Activities 13
2.2 Environmental Risk Register 22
2.3 Legislative and Other Requirements 23
3. Implementation and Operation 30
3.1 CEMP Management Structure and Responsibility 30
3.2 Environmental Training and Induction 35
3.3 Environmental Maps 37
3.4 Operating Procedures 38
3.5 Emergency and Incident Response 54
3.6 Communication and Interface 60
3.7 Transition Phase 65
4. Monitor and Review 66
4.1 Compliance Monitoring 66
4.2 Reporting 69
4.3 Environmental Auditing 71
4.4 Corrective Action 72
4.5 CEMP Management Review 74

Appendices

Appendix A	Environmental Risk Register Template & Example
Appendix B	Environmental Risk Rating Tables
Appendix C	Environmental Maps/Plans
Appendix D	Construction Noise and Vibration Management Plan
Appendix E	Construction Air Quality Management Plan
Appendix F	Erosion and Sediment Control Plan
Appendix G	Temporary Stormwater Management Plan
Appendix H	Ecological Management Plan
Appendix I	Groundwater Management Plan
Appendix J	Settlement Effects Management Plan
Appendix K	Contaminated Soils Management Plan
Appendix L	Hazardous Substances Management Plan
Appendix M	Archaeological Site Management Plan
Appendix N	Construction Traffic Management Plan
Appendix O	Concrete Batching and Crushing Plant Management Plan
Appendix P	Summary of Monitoring Requirements
Appendix Q	General and Emergency Contacts
Appendix R	Environmental Incident / Emergency, Complaint and Audit Form, and Non – Compliance Report

Glossary of Abbreviations

Term	Definition
ACC	Auckland City Council
AEE	Assessment of Environmental Effects
ALWP	Proposed Auckland Regional Plan: Air, Land and Water
Auckland City District Plan	Operative Auckland City District Plan (Isthmus Section) 1999
AMA	Auckland Motorway Alliance
ARC	Auckland Regional Council
ASMP	Archaeological Site Management Plan
AWR	Alan Wood Reserve
BPO	Best Practicable Option
CBCPMP	Concrete Batching and Crushing Plant Management Plan
CAQMP	Construction Air Quality Management Plan
CCR	Construction Compliance Report
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CMA	Coastal Marine Area
CNVMP	Construction Noise and Vibration Management Plan
COPTTM	Code of Practice for Temporary Traffic Management
CPA 1	Coastal Protection Area 1
CPA 2	Coastal Protection Area 2
CST option	Combined Surface and Tunnel option
CSMP	Contaminated Soils Management Plan
CTMP	Construction Traffic Management Plan
CY	Construction Yard
dBA	Decibels
DoC	Department of Conservation
ECBF	East Coast Bays Formation
ECF	Environmental Complaint Form
ECR	Environmental Complaint Register
ECOMP	Ecological Management Plan

Term	Definition
EIEF	Environmental Incident / Emergency Form
EIEF	Environmental Incident / Emergency Register
EMP	Environmental Management Plan
EPA	Environmental Protection Authority
ESCP	Erosion and Sediment Control Plan
GIS	Geographic Information Systems
GPS	Government Policy Statement on Land Transport Funding
GWMP	Groundwater Management Plan
HAP	Hazardous Air Pollutants
HPA	Historic Places Act 1993
HPT	Historic Places Trust
HSMP	Hazardous Substances Management Plan
LP	Landscape Plan
NCR	Non-Compliance Report
NES	National Environmental Standards
NESAQ	National Environmental Standards for Air Quality
CNVMP	Noise Management Plan
NO2	Nitrogen Dioxide
NOR(s)	Notice of Requirement(s)
NZHPT	New Zealand Historic Places Trust
The NZTA	The New Zealand Transport Agency
OEMP	Operational Environmental Management Plan
OMC	Operations and Maintenance Contractor
OPW	Outline Plan of Works
OSMP	Operational Stormwater Management Plan
The Proposal	Western Ring Route: Waterview Connection Project (SH16-20) which is the subject of all Resource Consents and Notices of Requirement
RMA	Resource Management Act 1991
RoNS	Road of National Significance
SEMP	Settlement Effects Management Plan
SEV	Stream Ecological Valuations

Term	Definition
SH x	State Highway (number)
SIA	Social Impact Assessment
TP10	ARC Technical Publication Number 10: Stormwater Management Devices Design Guideline Manual
TP90	ARC Technical Publication Number 90: Erosion and Sediment Control Guidelines for Land Disturbing Activities
TSMP	Temporary Stormwater Management Plan
Waitakere City District Plan	Operative Waitakere City District Plan 2003
WCC	Waitakere City Council
WRR	Western Ring Route

Glossary of Terms

Term	Definition
Alan Wood Reserve	A reserve of approximately 9ha in Auckland City adjacent to Hendon Avenue. It is noted that community reference to this area also commonly includes land designated and owned by the Crown for Railway purposes (this area is not included in the 9ha of reserve).
Alignment	The route or position of an existing or proposed motorway.
Ambient Air	The air outside buildings and structures. . It does not refer to indoor air, air in the workplace, or to contaminated air as it is discharged from a source.
Ambient Sound	The total sound existing at a specified point and time associated with a given environment. The ambient sound is usually a composite of sounds from several sources, near and far.
Amenity	Defined in Section 2 of the RMA as those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.
Archaeological site	Defined in Part 2 of the Historic Places Act 1993 as any place in New Zealand that - (a) Either- • Was associated with human activity that occurred before 1900; or • Is the site of the wreck of any vessel where that wreck occurred before 1900; and (b) Is or may be able through investigation by archaeological methods to provide evidence relating to the history of New Zealand.
[Auckland Council]	The new unitary authority to replace the eight existing councils in the Auckland Region as of October 2010.
Best Practicable Option	Defined in Section 2 of the RMA. In relation to a discharge of a contaminant or an emission or noise, this means the best method for preventing or minimising the adverse effects on the environment.
Brickworks Site	The former Auckland Brick and Tile Company brickworks and wharf site at Te Atatu.
Carrington Road Bridge	The bridge located on Carrington Road spanning SH16.
Chamberlain Park	The public golf course located in Auckland City adjacent to SH16 and St Lukes Road.
Causeway Bridges	The Bridges located along the State Highway 16 Causeway (Identified in the NZTA Highway Information as the Causeway Bridges).
Coastal Marine Area	Defined in Section 2 of the RMA. The foreshore, seabed, and coastal water, and the air space above the water- (a) of which the seaward boundary is the outer limits of the territorial sea:

Term	Definition
	(b) of which the landward boundary is the line of mean high water springs, except that where that line crosses a river, the landward boundary at that point will be whichever is the lesser of— (i) 1 kilometre upstream from the mouth of the river; or (ii) The point upstream that is calculated by multiplying the width of the river mouth by 5.
CS-VUE	A web-based digital framework that supports Environmental Management Systems and compliance with statutory requirements and environmental permits
Culvert	A pipe designed to convey water under a structure (such as a road).
Cut and Cover Tunnelling	A method of construction for tunnels where a trench is excavated and roofed over.
Cycleway	A dedicated facility for the use of cyclists.
dBA	A measurement of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
Designation	Defined in Section 2 and Section 166 of the RMA as provision made in a district plan to give effect to a requirement made by a requiring authority.
Discharge	An activity that results in a contaminant being emitted deposited or allowed to escape.
Diversion of Stormwater	Redirecting stormwater from its existing course of flow; causing it to flow by a different route.
Do Nothing Approach	Term used in the context of a comparison between the effects of a project and the effects that would occur if the Project was not undertaken (i.e. for the comparative evaluation of the effects 'with and without' the Project).
Drained Tunnel	A drained tunnel lining drains the ground to reduce loads upon itself. This is achieved by using drainage measures such as a geotextile membrane to divert water to a longitudinal drain located at the base of the tunnel. The drainage measures limit the development of water pressures acting on the lining. This has the benefit of reducing loads on the final tunnel lining, but results in permanent drainage of the surrounding ground.
Drystone Wall	A 130m long drystone wall in Point Chevalier constructed in the mid 1800's which extends into the mud flats adjacent to the SH16 Causeway.

Term	Definition
Effect	Defined in Section 3 of the RMA. The term effect includes: • Any positive or adverse effect; and • Any temporary or permanent effect; and • Any past, present, or future effect; and • Any cumulative effect which arises over time or in combination with other effects regardless of the scale, intensity, duration, or frequency of the effect, and also includes- • Any potential effect of high probability; and • Any potential effect of low probability which has a high potential impact.
Erosion Control	Methods to prevent or minimise the erosion of soil, in order to minimise the adverse effects that land disturbing activities may have on a receiving environment.
Façade Effect	The reflection of sound from the façade of a building. The NZTA Guidelines specify receiver positions to be assessed at 1 metre from the most exposed façade. The façade effect adds 2.5 decibels to predicted noise levels.
Fish Passage	The movement of fish between the sea and any river, including upstream or downstream in that river.
Avondale Southdown Rail Designation	Designation *G08-05 – Railway Purposes Avondale Southdown Line*, in the Auckland City Council's District Plan. The designation allows for the construction and operation of the rail line (freight and potentially passenger) linking from the North Auckland Line (Avondale) to Southdown (Onehunga) and rail stations along this corridor. In particular, reference in the context of the Waterview Connection Project addresses the area of this designation extending from the Maioro Interchange (SH20 Mt Roskill termination) to the NAL (at New North Road).
Grade Separated Interchange	The lay out of roads (or rail) where one road crosses over/under the other at a different height.
Great North Road Interchange	An existing grade separated interchange between Great North Road and SH16 in the vicinity of Waterview / Point Chevalier, Auckland.
Great North Road – cut cover area	From the Great North Road Interchange, the alignment will be two cut-cover tunnels (some 2.5m apart) beneath Great North Road to connect to the deep tunnel at Sector 8.
Groundwater	Natural water contained within soil and rock formations below the surface of the ground.
Harbutt Reserve	An Auckland City Council reserve approximately 6ha in size located on Harbutt Avenue.
Heritage Site	A site that contributes to an understanding and appreciation of New Zealand's history and cultures. A heritage site can be derived from archaeological, architectural, cultural, historic, scientific and technological fields.

Term	Definition
Harbourview Orangihina Park	A 84ha Park located on the eastern shore of Te Atatu Peninsula immediately adjacent to the Te Atatu Interchange. The southern part of the Park is currently leased and occupied by the Te Atatu Pony Club.
Hendon Park	A 1.6ha area of reserve land adjacent to Hendon Road. The southern boundary adjoins the Avondale Southdown Rail Designation.
Industrial Area – Richardson Rd	A Mixed use zoned area along Richardson Road currently occupied by a range of light industrial activities.
Industrial Area – Rosebank Road	One of the large Industrial/Commercial areas in West Auckland located on the Rosebank Peninsula.
Jack Colvin Park	A 4ha Recreation Reserve adjacent to the Te Atatu Roundabout and occupied by the Te Atatu Rugby League Club.
L_{eq}	The time averaged sound level (on a log/energy basis) over the measurement period (normally A-weighted).
L_{95}	The sound level which is equalled or exceeded for 95% of the measurement period. L95 is an indicator of the mean minimum noise level and is used in New Zealand as the descriptor for background noise (normally A-weighted).
L_{10}	The sound level which is equalled or exceeded for 10% of the measurement period. L10 is an indicator of the mean maximum noise level and is used in New Zealand as the descriptor for intrusive noise (normally A-weighted).
L_{max}	The maximum sound level recorded during the measurement period.
Land Disturbing Activity	Any disturbance to the ground surface that may result in soil erosion through the action of wind or water.
Leachate	Liquid that has infiltrated through or emerged from solid waste and that contains dissolved and/or suspended chemical liquids and/or solids and/or gases.
Maioro Street Interchange	A diamond interchange proposed for the SH20 Motorway connection at Maioro Street in New Windsor.
McCormick Green	A 1.5ha Recreation Reserve to the south of the Te Atatu Interchange.
Meola Creek	A meandering creek running from St Lukes to Point Chevalier via Great North Road, SH16 and Chamberlain Park and discharges to the Waitemata Harbour near Meola Road in Point Chevalier.
Mg/m^3	Milligrams (10-3) per cubic metre. Conversions from mg/m^3 to parts per volume concentrations are calculated at 25 degrees Celsius as recommended by the Ministry of the Environment.
Motorway	Motorway means a motorway declared as such by the Governor-General in Council under section 138 of the PWA or under section 71 of the Government Roading Powers Act 1989.

Term	Definition
Motu Manawa (Pollen Island) Marine Reserve	A Marine Reserve created 12 October 1995 to protect 500 hectares of estuarine habitat in the upper reaches of the Waitemata Harbour, being Part Bed of the Waitemata Harbour, situated in Block XV, Waitemata Survey District, and Block III, Titirangi Survey District, as shown marked A and B on SO Plan 68062, lodged in the office of the Chief Surveyor for the North Auckland Land District.
New Zealand Railways Corporation	New Zealand Railways Corporation is the state owned enterprise that manages the rail and ferry businesses owned by the New Zealand government. Although New Zealand Railways Corporation is the legal name for the organisation (and the name of the Requiring Authority), KiwiRail is the trading name.
Natural Ground Level	The existing ground level of the land before any filling, excavation or construction activity.
Noise Mitigation	An activity or structure which reduces/mitigates the impact or effect of noise.
NOx	Oxides of nitrogen – a suite of gaseous contaminants that are emitted from road vehicles and other sources. Some of the compounds can react in the atmosphere and, in the presence of other contaminants, convert to different compounds (e.g., NO to NO2).
Northwestern Cycleway	A dedicated cycleway adjacent to the Northwestern Motorway, extending from Auckland's CBD and connecting to the Te Atatu Cycleway. In particular, this Project refers to the section of this cycleway between St Lukes Road and the Te Atatu Interchange.
Northwestern Motorway	That section of State Highway 16 which is declared motorway extending from Central Motorway Junction to its connection with State Highway 18.
Oakley Creek	A meandering stream that runs from Mt Albert to Waterview via Underwood Reserve, Alan Wood Reserve, and Oakley Creek Reserve. Oakley Creek discharges to the Coastal Marine area near SH16 at the Great North Road interchange.
Oakley Creek Esplanade Reserve	An Auckland City reserve of approximately 9ha located between Great North Road and Unitec.
Oakley Inlet	That part of the estuary outside of the Motu Manawa (Pollen Island) Marine Reserve and identified as Coastal Protection Area 1 extending from the mouth of the Oakley Creek to the Causeway Bridges.
Overflow	A discharge from a combined sewer or wastewater network resulting from the flows being greater than the conveyance capacity within the network.
Overland Flow Path	The natural flow path of stormwater over the ground.
Patiki Cycleway Bridge	A dedicated cyclist/pedestrian overpass at the Patiki Road On-Ramp.

Term	Definition
Patiki Off-Ramp Bridge	An Off-Ramp Bridge providing a connection from Patiki Road from eastbound traffic to Auckland City.
Phyllis Reserve	A recreation reserve in Auckland City of approximately 7ha. The reserve is dominated by sports fields and is leased and occupied by the Metro Mt Albert) Sports Club (amongst others).
Pier	Vertical support structure for a bridge.
Pollen Island	An estuarine shellbank Island to the north of the Rosebank Peninsula and within the Motu Manawa Marine Reserve.
Pollen Island Drainage Channel	Main channel that drains the mangrove wetland between Pollen Island and the Northwestern Motorway.
Portal	The entrance way to a tunnel starting where the road is completely uncovered to where it is completely covered.
PM10	Fine particulate matter with an equivalent aerodynamic diameter of less than 10, 2.5 or 1 micrometres respectively. Fine particulates are predominantly sourced from combustion processes. Vehicle emissions are a key source in urban environments.
Reclamation	As defined in the Auckland Regional Plan: Coastal. Any permanent filling of an area previously inundated by coastal water either at or above mean high water spring mark, whether or not it is contiguous with the land, so that the filled surface is raised above the natural level of MHWS, and thus creates dry land, removed from the ebb and flow of the tide.
Rosebank Interchange	A grade separated interchange providing a connection from Rosebank Road east to Auckland City and from west Auckland to Rosebank Road from SH16.
Rosebank Park Domain	Rosebank Park Domain is a Recreation Reserve adjacent to the Rosebank Peninsula occupied by the Auckland Kart Club and Auckland Speedway Rides Club.
Sector 1	That part of the Project that extends from the eastern abutments of the Henderson Creek Bridge to western abutment of the Whau Creek Bridge including the Te Atatu Interchange.
Sector 2	That part of the Project that includes work and structures over and within the Whau River.
Sector 3	That part of the Project that includes the landward (southern) component of the Rosebank Peninsula including Patiki Road and the Rosebank Park Domain.
Sector 4	That part of the Project that requires reclamation including along the Rosebank Peninsula and the causeway between Rosebank Peninsula and Waterview. This sector includes parts of Traherne Island.
Sector 5	That part of the Project occupied by the SH16/SH20 Interchange

Term	Definition
Sector 6	That part of the Project that includes the additional lanes on the existing Northwestern Motorway, between the Waterview Interchange and St Lukes Interchange (the SH16 section of the Project).
Sector 7	That part of the Project that refers to the 'cut and cover' section of tunnel from the northern portal at (Waterview Park), crossing beneath Great North Road to connect with the deep tunnel (Sector 8).
Sector 8	That part of the Project that refers to the section of the Project from the Alan Wood Reserve (southern portal) beneath 'Avondale Heights' (the 'deep tunnel' section of the Project).
Sector 9	That part of the Project that refers to the construction of the Maioro Street Interchange north facing ramps and the motorway from the existing termination of SH20 under Richardson Road Bridge through Allan Wood Reserve to the southern tunnel portal as a surface motorway.
Sediment Control	Capturing sediment that has been eroded and entrained in overland flow before it enters the receiving environment.
Settlement	The gradual sinking of the ground surface as a result of the compression of underlying material.
SH20 Cycleway	A cycleway (walkway), alongside SH20 providing connection from Hillsborough to Maioro Road.
Star Mill/Tannery	The Star Mill/Garrett Brothers Tannery archaeological site, identified by the New Zealand Archaeological Association site number R11/2191.
Te Atatu Interchange	Grade separation intersection at Te Atatu that provides a connection between the state highway and the local roads using a series of ramps.
Tunnel Portal Locations	The general location of the northern portal is at the southern end of Waterview Reserve. The general location of the southern portal is within Alan Wood Reserve.
Traherne Island	A small waterlogged Island to the east of the Rosebank Peninsula and bisected by the Northwestern Motorway.
µg/m³	Micrograms (10-6) per cubic metre. Conversions from µg/m³ to parts per volume concentrations (i.e. ppb) are calculated at 25 degrees Celsius.
Un-drained Tunnel	An un-drained tunnel lining uses either water proofing membranes (usually heat welded PVC sheets) on the outside of the tunnel lining, or preferably in the case of pre-cast segment linings, recessed compression gaskets, to prevent water ingress. The effect is to increase the forces on the permanent lining, as a result of the developed water pressures. An un-drained tunnel largely prevents water ingress into the tunnel and therefore must resist groundwater pressures.
Underwood Park	A 4ha Auckland City Reserve located in Owairaka with frontages to Richardson Road, Wainright Road and Beagle Avenue.
Ventilation Stack	A structure which channels air emissions to a height in the atmosphere which is suitable to disperse the emissions and result in an acceptable

Term	Definition
	ambient air quality.
Western Ring Route (WWR)	A strategic highway route which provides an alternative to SH1 as a regional route for traffic crossing greater Auckland. The WWR requires the completion of missing links and new lanes to combine the Southwestern (SH20), Northwestern (SH16) and Upper Harbour (SH18) highways into a continuous 48km motorway. The WWR will link the North Shore, Waitakere, Auckland and Manukau cities.
Waterview Cycleway	A commuter cycleway connecting the existing SH20 cycleway at Maioro Street to the Northwestern Cycleway (parallel to SH16).
Waterview Reserve	A 4ha Auckland City Reserve located at the mouth of the Whau River with frontage to Cowley and Herdman Streets ("also known as Oakley Park).
Waterview Estuary Inlet	That part of the estuary within the Motu Manawa (Pollen Island) Marine Reserve and identified as Coastal Protection Area 1 underneath the Causeway Bridges.
Whau River Bridges	Two bridges over the Whau River with a dedicated cyclist/pedestrian bridge alongside heading west.

1. Background

1.1 Introduction

This Construction Environmental Management Plan (CEMP) details the methods and tools to be implemented by the construction contractors to manage, remedy and mitigate potential adverse environmental effects that meet resource consents and designation conditions, relevant legislation and the NZTA's environmental objectives.

The Government has identified a suite of 'roads of national significance' (RoNS) and set priority for investment in these as New Zealand's most important transport routes. The RoNS are critical to ensuring that users have access to significant markets and areas of employment and economic growth.

The Western Ring Route (WRR) is identified as a RoNS. It comprises the State Highway 20 (SH20), State Highway 16 (SH16) and State Highway 18 (SH18) motorway corridors and, once completed, will consist of 48km of motorway linking Manukau, Auckland, Waitakere and the North Shore.

The strategic importance of the WRR is to provide an alternative route through the region to reduce dependency on SH1, particularly through the Auckland Central Business District (CBD) and across the Auckland Harbour Bridge. The WRR will also provide for economic growth, unlocking potential for development along its length by improving trip reliability and access from the west to the south of the region, and from the CBD to the southern Auckland isthmus and airport.

The Waterview Connection Project (Project) is the final project to complete the WRR, providing for works on both State Highway 16 (SH16) and State Highway 20 (SH20) to establish a high-quality motorway link that will deliver the WRR. The Project will be the largest roading project ever undertaken in New Zealand. The location of the Waterview Connection is shown in Figure 1-1.

The key elements of the Waterview Connection Project are:

- Completing the Western Ring Route (which extends from Manukau to Albany via Waitakere);
- Improving resilience of the SH16 causeway between the Great North Road and Rosebank Interchanges to correct historic subsidence and "future proof" it against sea level rise;
- Providing increased capacity on the SH16 corridor (between the St Lukes and Te Atatu Interchanges);
- Providing a new section of SH20 (through a combination of surface and tunnelled road) between the Great North Road and Maioro Street Interchanges; and
- Providing a cycleway through the surface road elements of the Project corridor.

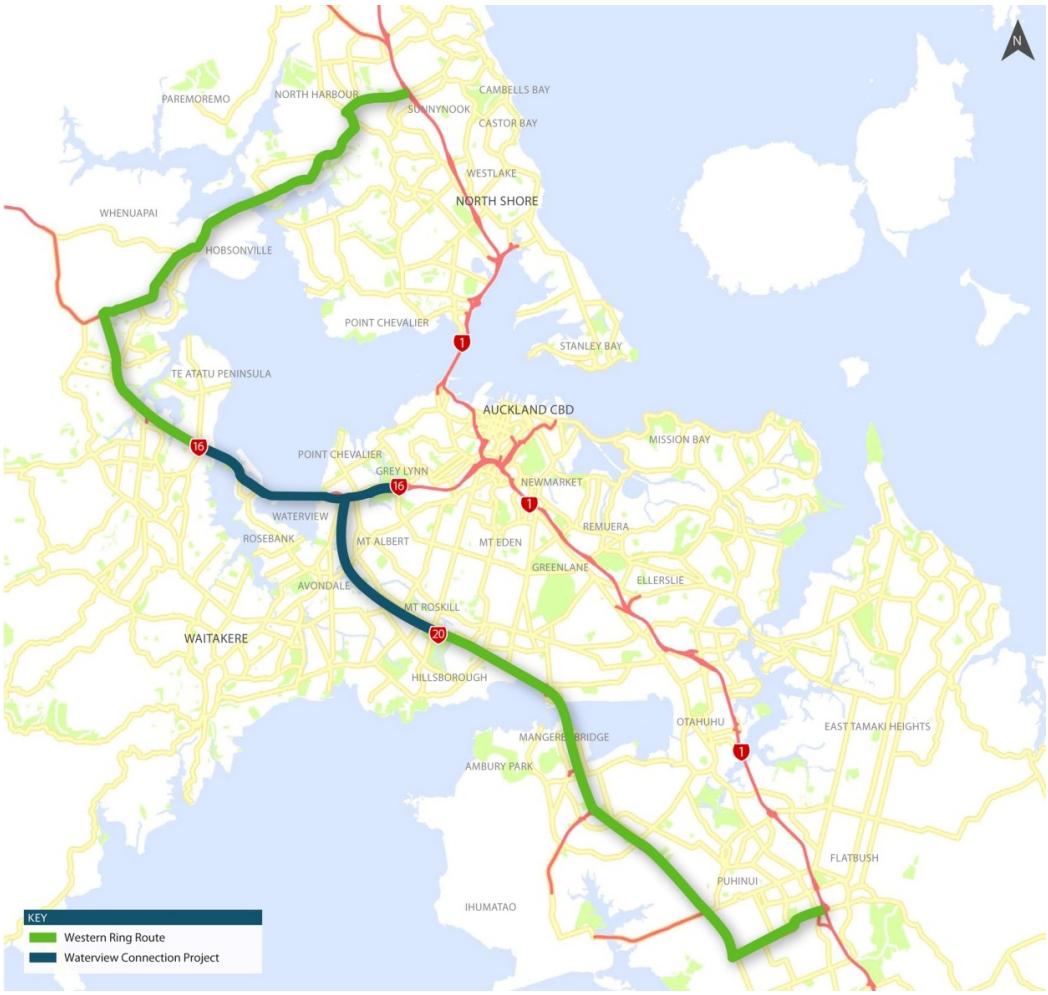

Figure 1-1 Waterview Connection Location

1.2 Purpose and Application

The purpose of this Construction Environmental Management Plan (CEMP) is to describe the environmental management and monitoring procedures to be implemented during the Project's construction phase. The CEMP is fundamental to the assessment of environmental effects process and will ensure that commitments given in obtaining approvals for the Project are carried out at the construction stage. The CEMP will ensure that appropriate environmental management practices are followed during the Project's construction phase.

The CEMP will enable the NZTA and its contractors to construct the Project with the least adverse environmental effect. Overall, implementation of this CEMP will ensure:

- Compliance with the conditions of resource consents and designations.
- Compliance with environmental legislation.
- Adherence to the NZTA's environmental objectives.
- Environmental risks associated with the Project are properly managed.

The CEMP defines details of who, what, where and when environmental management and mitigation measures are to be implemented. The CEMP covers all anticipated construction elements and presents a framework of principles, environmental policy, objectives and performance standards as well as processes for implementing good environmental management. This CEMP establishes the relationship with the related environmental sub-management plans (sub-plans).

Section 1 of this plan details the Project background, provides a description of the Project, outlines the scope of the CEMP and the relevant environmental policy, and environmental objectives.

Section 2 presents the social and environmental management context of the Project. The section details the main construction activities of the Project and the Environmental Risk Register to be populated and maintained by the contractor to identify significant environmental aspects and risks associated with these activities. Minimum environmental management standards and specifications for managing the significant environmental aspects of the construction phase are discussed. The section also identifies the key legislative requirements applicable to the environmental aspects of the Project.

Section 3 outlines the implementation and operation of the CEMP. This section details the CEMP roles and responsibilities and the related training requirements for the construction phase of the Project. Further descriptions of the related sub-plans and the operating procedures (including measures to mitigate the potential adverse environmental effects, which will tie in with the conditions of consent and designations) are provided. This section details the management of emergencies and incidents, complaints and the guidelines for internal and external communications and interface.

Section 4 details the tools for the implementation of good environmental management including monitoring and review requirements of the CEMP, auditing procedures, corrective actions and management reviews of the CEMP.

1.3 Project Description

1.3.1 Description of Sectors

The Waterview Connection Project has been divided into nine sectors which broadly define the different construction requirements of the Project. The sectors are shown on Figure 1-2 and a brief description of each is given below.

1.3.1.1 Sector 1- Te Atatu Interchange

Sector 1 includes significant improvements to the Te Atatu Interchange. These include enlargement and re-configuration of the on and off ramps to accommodate additional lanes on SH16 and to provide for a bus shoulder and priority for other HOVs.

There are also modifications to the configuration of the Interchange including provision to accommodate vehicle stacking resulting from ramp signalling and improved facilities for pedestrians and cycles using the interchange.

1.3.1.2 Sector 2 – Whau River

Sector 2 includes the enlargement of the existing Whau River Bridge to accommodate additional lanes. A separate dedicated cycle/pedestrian bridge is also to be constructed alongside the enlarged Whau River Bridge.

1.3.1.3 Sector 3- Rosebank - Terrestrial

Sector 3 of the Project involves the re-configuration of the existing Rosebank on and off ramps to improve traffic merging. The outside westbound lane will be “dropped” at the Rosebank exit ramp.

Between the Rosebank Interchange and the Te Atatu Interchange additional lanes will be added on SH16 to provide four lanes eastbound and westbound. A bus shoulder will also be provided in both directions.

1.3.1.4 Sector 4 - Reclamation

Sector 4 involves the provision of two additional westbound lanes on SH16 from the Great North Road Interchange to the Rosebank Road Interchange to create a total of five westbound lanes plus a dedicated bus shoulder. An additional lane will be added from the Rosebank Interchange to the Great North Road Interchange to create total of four eastbound lanes in this section. Reclamation in the CMA will be required to facilitate the additional lanes.

The causeway will be raised in response to historic subsidence of the causeway and “future proofing” it against sea level rise.

1.3.1.5 Sector 5 – Great North Road Interchange

Sector 5 of the Project extends from the Waterview Park area and incorporates the ramps and alignment associated with the connection of SH20 to SH16 (the Great North Road Interchange). This sector incorporates the retaining wall approaches to the northern portal of the cut and cover tunnel.

1.3.1.6 Sector 6 – SH16 to St Lukes

Sector 6 of the Project includes the additional lanes on SH16, between the Great North Road Interchange and St Lukes Interchange.

1.3.1.7 Sector 7 – Great North Road Underpass

Sector 7 refers to the 'cut and cover' section of tunnel from the northern portal at (Waterview Park), crossing beneath Great North Road to connect with the driven tunnels (Sector 8). The section comprises both a north bound and south bound tunnel. The cut and cover tunnel section will be approximately 400 m long and 31 m wide. It varies in depth from 30 m deep at the southern end to typically 10 m deep at the northern end.

1.3.1.8 Sector 8 – Avondale Heights Tunnels

Sector 8 refers to the section of the Project of the two driven tunnels, one north bound and one south bound, with an approximate maximum depth of 65 m in the vicinity of Phyllis Street. The two tunnels are approximately 2.5 km long, with each tunnel comprising 1m shoulders on each side, and carrying three lanes of traffic (3.5 m wide each). The tunnels will be approximately 15 m apart. They head in a southerly direction from the cut and cover tunnel (Sector 7), through to Alan Wood Reserve, passing beneath Avondale Heights/ Springleigh, the North Auckland Rail Line and New North Road. The tunnels will emerge at grade approximately halfway along the length of Alan Wood Reserve.

1.3.1.9 Sector 9 – Alan Wood Reserve

Sector 9 refers to the section of the Project from where the driven tunnels emerge into Alan Wood Reserve at the southern portals. The two carriageways will continue through Alan Wood Reserve, under the proposed Richardson Road Bridge and continue to join up with the existing SH20 motorway section at the Maioro Street Intersection. The motorway alignment will require realignment of sections of Oakley Creek, and realignment of the Stoddard Road tributary. The motorway alignment through Hendon Park and Alan Wood Reserve will be raised above the 100 year flood event level. The southern ventilation building and stack will be located within this sector.

Western Ring Route: Waterview Connection (SH16-20) - Sector Diagram

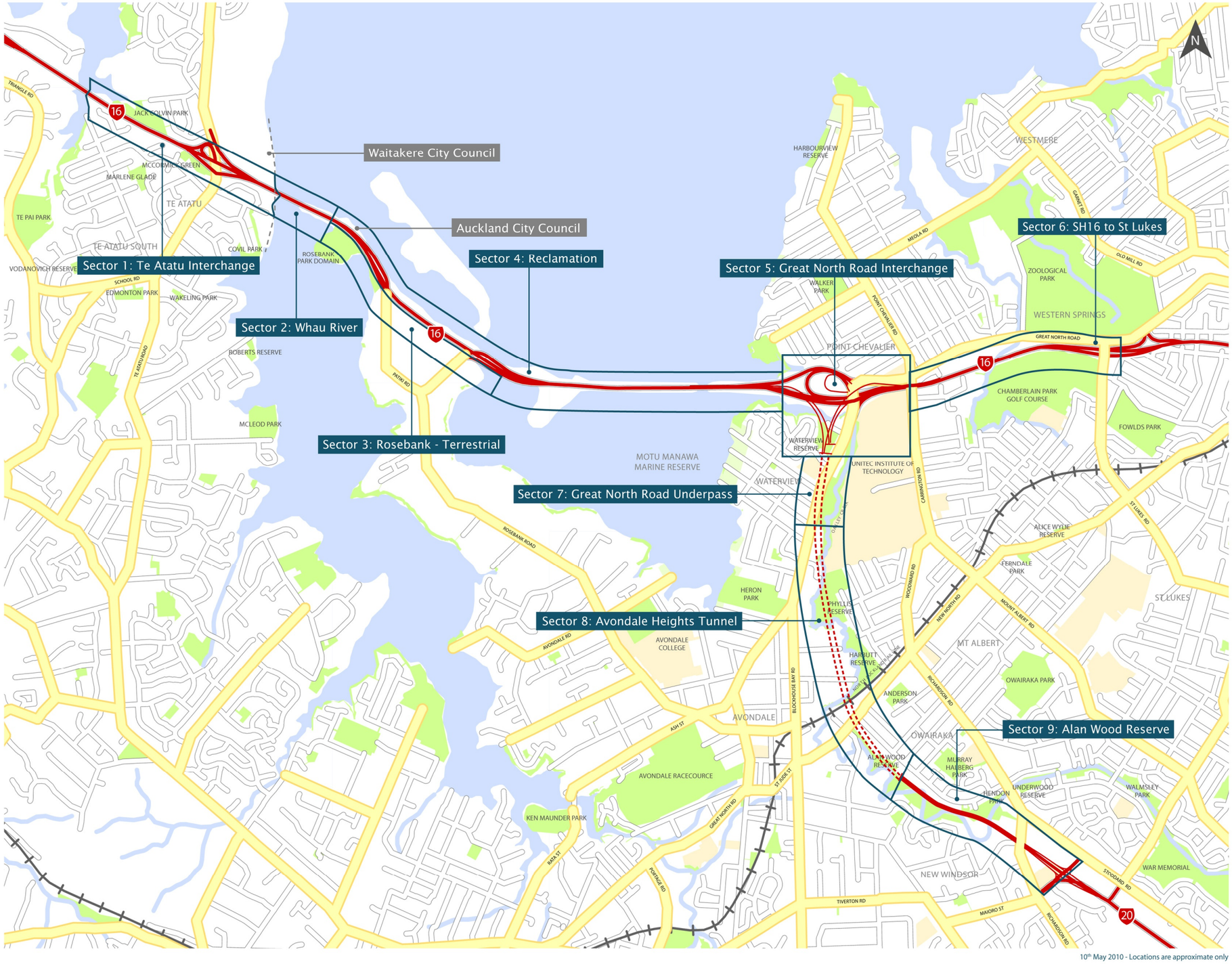

Figure 1-2 Sector locations

1.3.2 Environmental Management Plan Structure and Context

The CEMP is an overarching document which supports the applications for resource consents and designations and, ultimately, provides a blueprint to be used by the construction contractors to manage the environmental effects of the Project. The principles and general approach to managing the environmental effects are set out in the main body of the document. The management of specific effects (e.g. construction air quality, noise, vibration etc.) are detailed more particularly within a suite of environmental management plans (sub-plans) that form the appendices to the CEMP. This suite of management plans is:

- Construction Noise and Vibration Management Plan (CNVMP)
- Construction Air Quality Management Plan (CAQMP)
- Erosion and Sediment Control Plan (ESCP)
- Temporary Stormwater Management Plan (TSMP)
- Ecological Management Plan (ECOMP)
- Groundwater Management Plan (GWMP)
- Settlement Effects Management Plan (SEMP)
- Contaminated Soils Management Plan (CSMP)
- Hazardous Substances Management Plan (HSMP)
- Archaeological Site Management Plan (ASMP)
- Construction Traffic Management Plan (CTMP)
- Concrete Batching and Crushing Plant Management Plan (CBCPMP)

Matters that have been addressed within each of these plans are identified in the subsequent sections of this CEMP. The relationship between the designation and resource consent conditions, the CEMP and the sub-plans is shown in Figure 1-3.

Beyond the construction phase, the NZTA will utilise an Operational Environmental Management Plan to manage environmental aspects of the operation and maintenance of the asset.

This CEMP and the various environmental sub-plans may require review and amendment during the life of the Project to reflect changes to activities, risks, mitigation measures, responsibilities and management processes. The ability to make changes to the CEMP is an important aspect of continually improving the effectiveness of the CEMP. Modification may be required once the consents and designations are obtained, contractors selected and detailed design and construction methods finalised.

The contractor(s) will be required to undertake all construction activities on site in accordance with the provisions of the relevant management plans as part of their contractual arrangements.

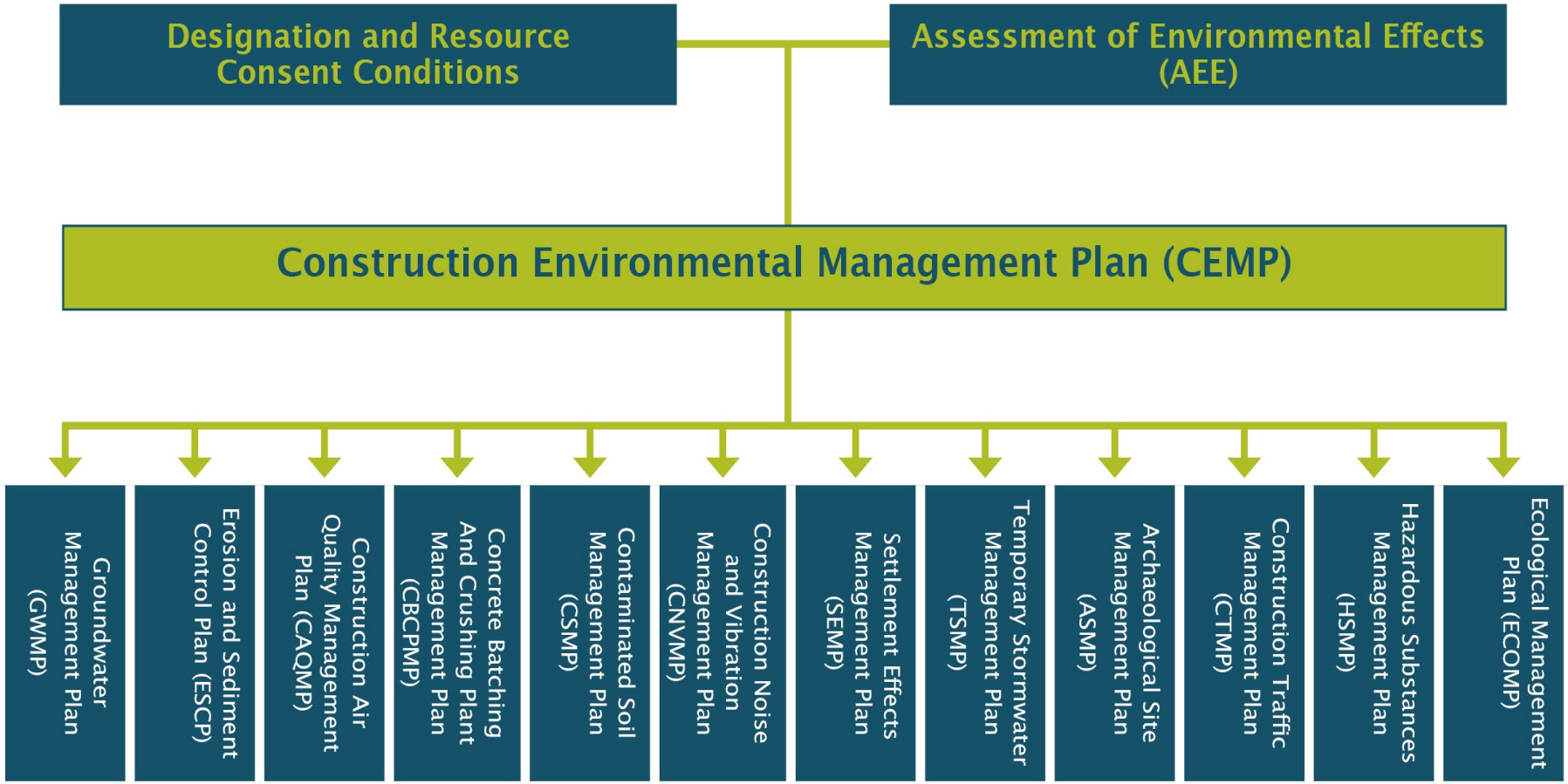

Figure 1-3 Construction Environmental Management Framework

1.3.3 Assessment of Environmental Effects

This CEMP and its sub-plans are consistent with and complement the Waterview Assessment of Environmental Effects (AEE). The AEE contains a number of technical assessment reports which inform the specific environmental management, monitoring and mitigation measures described within the sub-plans for the contractor to implement to manage actual and potential environmental effects during construction. Table 1.1 identifies the technical assessment reports that relate to each sub-plan appended to this CEMP.

Table 1.1 AEE technical assessment reports that informs each sub-plan

Sub-Plan	Technical Assessment Report
Construction Noise and Vibration Management Plan	G.5: Assessment of Construction Noise Effects
	G.19: Assessment of Vibration Effects
Construction Air Quality Management Plan	G.1: Assessment of Air Quality Effects
Erosion and Sediment Control Plan	G.22: Erosion and Sediment Control Plan (duplicated)
Temporary Stormwater Management Plan	G.15: Assessment of Stormwater and Streamworks Effects
Ecological Management Plan	G.8: Assessment of Herpetofauna Ecological Effects
	G.3: Assessment of Avian Ecological Effects
	G.17: Assessment of Terrestrial Vegetation Effects
	G.11: Assessment of Marine Ecological Effects
	G.6: Assessment of Freshwater Ecological Effects
Groundwater Management Plan	G.7: Assessment of Groundwater Effects
Settlement Effects Management Plan	G.13: Assessment of Ground Settlement Effects
Contaminated Soils Management Plan	G.9: Assessment of Land and Groundwater Contamination
Archaeological Site Management Plan	G.2: Assessment of Archaeological Effects
Construction Traffic Management Plan	G.16: Assessment of Temporary Traffic Effects
Concrete Batching and Crushing Plant Management Plan	G.1: Assessment of Air Quality Effects
	G.15: Assessment of Stormwater and Streamworks Effects
	G.5: Assessment of Construction Noise Effects

1.3.4 Project Phases

The Project will involve three main phases:

1. Construction: The construction phase of the Project is anticipated to take between 5 and 7 years and progress across a number of fronts to enable separate elements to be undertaken concurrently. There will be approximately six construction orientated work packages tendered by the NZTA. These will be related to the main construction activities in section 2.1. Any consents, designations and subsequent conditions granted which are relevant only during the construction phase will not be carried through to the operational phase. Monitoring of compliance with conditions of all consents and designations held by the NZTA will be entered into the contractors' CS-VUE project file (Described further in section 2.3.4.1). This CEMP has been prepared for the construction phase.

2. Transition: The transition phase is the crossover period between the construction and operational phases of the Project whereby the responsibility for the management of the environment is transferred from the construction contractor to the network operator. During this phase the construction contractor(s) will be required to work with the NZTA in finalising the construction and meet any post-construction resource consent and designation conditions before the Project is passed to the Operations and Maintenance Contractor (OMC). The transition phase also provides for the transfer of information on conditions which remain operative (such as long term environmental monitoring). Any resource consents and designations with components still operative will be entered into the operator's CS-VUE project file and managed by the OMC. The transition phase includes the defects liability period.

3. Operation: Once completed, the ongoing responsibility for the operations and maintenance of the infrastructure associated with the Project will be transferred to the OMC. The NZTA will utilise an Operational Environmental Management Plan to manage environmental aspects of the operation and maintenance of the asset. The current OMC for the Auckland motorway within the Project area is the Auckland Motorway Alliance (AMA).

1.4 Environmental Policy

To ensure effective environmental management during the construction phase of the Project, the policy framework for environmental management on the NZTA projects needs to be understood. This section outlines the key environmental policy, objectives, key performance indicators and environmental management approach underpinning the Project.

1.4.1 The NZTA Environmental Policy

The NZTA's environmental policy is embedded within the National State Highway Strategy goal:

To improve the contribution of state highways to the environmental and social wellbeing of New Zealand and prioritise and address environmental and social issues by developing approaches and implementation plans for each category of environmental and social impact.

1.4.2 The NZTA's Environmental Objectives and Key Performance Indicators

The NZTA's objective[1], states:

The objective of the NZTA is to undertake its functions in a way that contributes to an affordable, integrated, safe, responsive, and sustainable land transport system.

In meeting its objectives and undertaking its functions, the NZTA must exhibit a sense of social and environmental responsibility, which includes:

- avoid, to the extent reasonable in the circumstances, adverse effects on the environment;
- ensure, to the extent practicable, that person or organisations preparing regional transport programmes take into account the views of the affected communities;
- give early and full consideration to land transport options and alternatives in a manner that contributes to the matters in the preceding paragraphs; and
- provide early and full opportunities for specified persons and organisations to contribute to the development of its land transport programmes[2].

In addition to its statutory objectives, the NZTA has developed a number of specific environmental objectives in order to improve its environmental performance. These objectives are set out within the NZTA's (Transit) *Environmental Plan: Improving Environmental Sustainability and Public Health in New Zealand,* June 2008[3]. Objectives and key performance indicators are provided in the NZTA Environmental Plan for each environmental aspect including noise, air quality, water resources, erosion and sediment control, social

[1] As contained in Section 94 of the Land Transport Management Act (LTMA), 2003.
[2] Section 96 of the LTMA
[3] NZ Transport Agency New Zealand Environmental Plan: Improving Environmental Sustainability and Public Health in New Zealand, Version 2, June 2008.

responsibility, culture and heritage, ecological resources, spill response and contamination, resource efficiency, climate change, visual quality and vibration.

Environmental management methods set out in this CEMP will remain consistent with the NZTA's overall objective, as well as the objectives and policies in the NZTA's Environmental Plan.

2. Social and Environmental Management

This CEMP addresses both the actual and potential effects on the environment that may be generated by the Project. These effects have been assessed based on the activities authorised by regional and district plans, resource consents and the designation; the NZTA do not anticipate effects beyond these authorised activities.

Section 2.1 identifies the Waterview Assessment of Environmental Effects Technical Reports which informs the mitigation detailed within the sub-plans.

Section 2.2 provides a summary of the construction activities and related environmental aspects of the Project including the location of these activities.

Section 2.3 details the use of an Environmental Risk register; a tool for the contractor to assess how these effects are best avoided and minimised during the construction phases of the Project. The Environmental Risk Register can be used by the NZTA, the [Auckland Council] and the future construction contractors as a reference to activity type, location, potential effect and impact, risk rating, mitigation options and relevant management plans for a particular environmental aspect. Section 3.4 and the sub-plans provide a description of the potential mitigation of environmental effects likely to be required and likely to be entered into the Register by the contractor.

Section 2.4 details the legal requirements applicable to the environmental management of the construction phase.

2.1 Construction Activities

Key construction activities associated with the Project include the construction of the driven tunnels, cut and cover tunnel, widening of a causeway, construction of new surface road and modification to existing interchanges. These activities have the potential to affect different aspects of the environment. Sub-plans detail mitigation measures specific to the environmental aspect and detail further the construction activity which causes the potential effect. Table 2.1 summarises key activities which occur in each section and possible sensitive receptors[4].

The following documents can be referenced for further information regarding construction activities

- Assessment of Environmental Effects – Chapter 5 - Description of the Proposed works
- Assessment of Environmental Effects - Chapter 23 - 31 – Assessment of Effects – Construction (Sectors 1-9)

[4] A sensitive receptor is a property/feature/location that is potentially more susceptible to the construction activities of the Project. Susceptible properties are those more likely to experience human health or nuisance effects. Susceptible features/locations are those valued by humans such as ecologically significant areas or archaeological sites.

Table 2.1 Construction activities, receiving environments and sensitive receptors in each sector

Sector	Activity (high level)	Receiving Environment	Sensitive Receptor
1	• Surface road works – widening and vertical realignment • Te-Atatu Interchange modification • Construction of stormwater wetland pond at Jack Colvin Park • Establishment and operation of construction yard and facilities - Harbourview-Orangihina Park - Causeway, Road and Bridge Builders yard Construction Yard (CY) 1.	• Henderson Creek • Pixie stream • Whau River	• Secondary schools • Residents • Birds roosting in Harbourview-Orangihina Park • Archaeological site (brickworks)
2	• Bridge Construction- upgrade and widening of Whau Bridge, construction of adjacent cycleway /pedestrian bridge, construction of temporary bridges both sides of existing bridge. • Reclamation - around bridge abutments.	• Whau River • Motu Manawa (Pollen Island) Marine Reserve	• Alwyn Avenue Residents • Birds roosting on Whau bridge
3	• Surface road works – motorway widening, upgrade of cycleway. • Bridge Construction - replacement of existing Patiki pedestrian / cycle bridge. • Retaining wall construction. • Construction of a new access road to Rosebank Park Domain. • Establishment and operation of construction yard – Patiki Road - road and bridge builder's yard.	• Whau River • Motu Manawa (Pollen Island) Marine Reserve Traherne Island • Waterview Inlet	
4	• Re-alignment of 3 channels within Waterview Inlet and Oakley Inlet. • Reclamation of SH16 causeway (raising and widening). • Surface road works. • Bridge construction - upgrade and widening of causeway bridges, construction of a new cycleway bridge, construction of temporary bridges both sides of existing bridge. • Retaining wall construction.	• Pollen Island • Traherne Island • Waitemata Harbour • Waterview Inlet • Oakley Inlet	• Pt Chevalier and Waterview residents • *Mimulus repens* • Birds roosting on the Causeway Bridges • Chenier ridge
5	• Bridge construction - construction of four new ramps within Great North Road Interchange including piling of foundations in the CMA, and installation of temporary platforms. • Construction of retaining wall approaches to the northern tunnels portal. • Establishment and operation of construction yard and facilities - Great North Road Interchange – causeway construction yard (CY3), stockpiling (CY4). Waterview Reserve – tunnel contractor's area/interchange contractor (CY6).	• Oakley Creek • Waitemata Harbour • Oakley Inlet • Waterview Inlet	• Waterview Primary School • St Francis School • Unitec • Waterview and Pt Chevalier residents • Archaeological site • Native skinks

Sector	Activity (high level)	Receiving Environment	Sensitive Receptor
6	• Surface road works – Widening of SH16 and upgrade of existing surfaces and associated retaining walls and fill embankment widening. • Establishment and operation of construction yard and facilities – Meola Creek - road builders yard (CY5).	• Meola Creek	• Residents • Native skinks
7	• Construction of the northern ventilation building. • Construction of the Great North Road underpass - cut and cover tunnel using a diaphragm wall construction. • Establishment and operation of construction yard and facilities - Oakley Creek Reserve - driven tunnel operation (CY 7).	• Oakley Creek • Waitemata Aquifer	• Waterview Primary School • St Francis School • Unitec • Waterview residents
8	• Driven tunnels construction. • Installation of ventilation system and operation buildings for the tunnels.	• Waitemata Aquifer	• Above ground Residential properties
9	• Southern portal construction - excavation to driven tunnels. • Surface road works – construction of motorway between southern portal to Maioro Street Interchange • Southern ventilation building construction. • Bridge construction - Richardson Road Bridge and associated retaining walls, Hendon Pedestrian Bridge. • Construction of the northern half of Maioro Street Interchange with associated retaining walls. • Stream diversions and culverting. • Establishment and operation of construction yard and facilities - Alan Wood Reserve - mechanical laydown area (CY 8), driven tunnels operations (CY9 & 10), Hendon Park - piling operations yard. (CY11), Valonia - bridge and road builders yard (CY12).	• Alan Wood Reserve • Hendon Park • Oakley Creek	• Residential Properties • Christ the Kind School • Caravan park
All sectors	• Enabling works /site establishment • Construction and installation of erosion and sediment control devices-refer to ESCP • Construction of permanent stormwater devices • Relocation of existing services • Waste management • Hazardous substances management • Urban design and landscaping		

2.1.1 Construction Duration

The Project is anticipated to take between 5 and 7 years to complete. It will able to be undertaken on a number of fronts or work faces, such that many elements of the Project will be undertaken concurrently.

The main construction elements[5] are:

1. Te Atatu Interchange, (Sector 1)
2. Causeway and Whau River Bridges (Sector 2, 3 and 4)
3. Great North Road Interchange (Sector 5)
4. SH16 Great North Road to St Lukes (Sector 6)
5. Tunnel (Sector 7 and 8)
6. SH20 to Maioro Interchange (Sector 9)

Figure 2-1 shows the approximate timing of these main activities and how the different work fronts may progress over and within the 5 - 7 year timeframe. It is reiterated that while there are some dependencies between these activities, the specific staging and phasing of the work will be dependent on procurement, the availability of contractors and availability of other resources (such as land, materials and construction equipment). This indicative programme assumes reduced earthworks activity through the winter period.

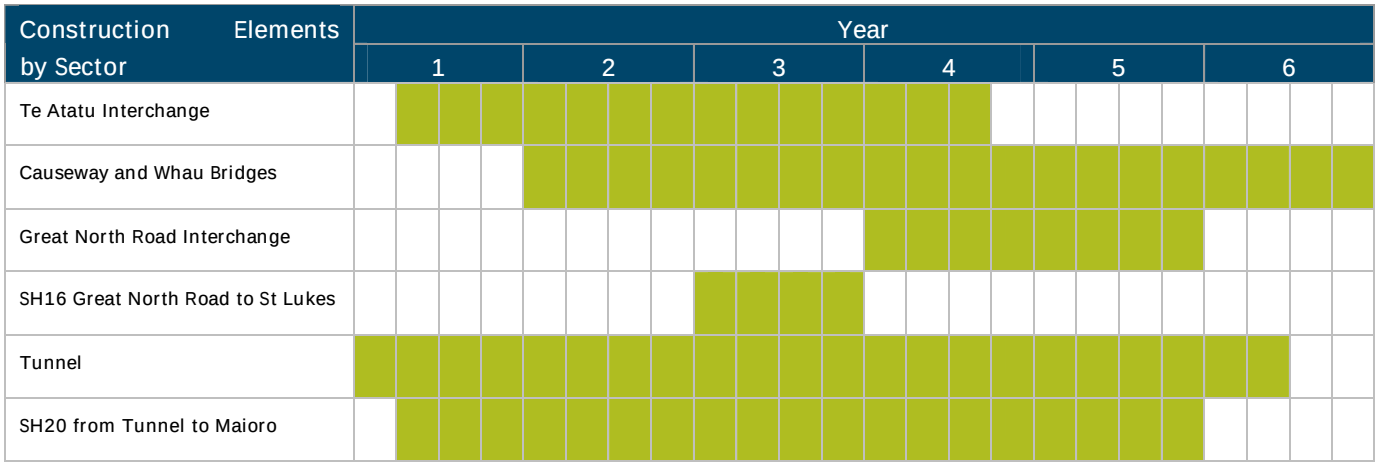

Figure 2-1 Summary of Work Programme

2.1.2 Night Time Works

Underground construction of the tunnels (Sector 8) will be carried out 24 hours a day, 7 days a week, for efficiency and safety reasons (e.g. so that works are not halted in mid-process). Access to the excavated tunnel will be via the construction yards within Sectors 7 and 9.

[5] Note: The proposed construction procurement strategy envisages the following construction sequence:
1. SH20 and Great North Road Interchange (Sector 5, 8, 9)
2. SH16 Causeway (Sectors 2, 3 and 4)
3. Sh16 Great North Road to St Lukes (Sector 6)
4. Te Atatu Interchange (Sector 1)

In order to minimise disruption to traffic, some works will also be undertaken on the existing Motorway at night. For example, this includes (but not limited to) the following major construction activities:

- Te Atatu Interchange Bridge Deck replacement (Sector 1)
- Te Atatu Interchange on/off ramps (localised sections only, where offline works need to tie in with the existing Te Atatu Road) (Sector 1)
- Underpass at Te Atatu eastbound on and off ramp (Sector 1)
- Patiki Cycle Bridge – removal of existing cycle bridge & positioning of replacement bridge (Sector 3)
- Erection of structures at the Great North Road Interchange over the live motorway (Sector 5)
- Some aspects of the widening works on SH16 between Great North Road Interchange and St Lukes adjacent to the live motorway (Sector 6)
- Works associated with the Great North Road underpass where traffic connections are required to the existing Great North Road arterial (Sector 7)
- Richardson Road bridge tie in (Sector 9)
- General Traffic Management set up and changes and removal throughout the life of the contract (all Sectors)

2.1.3 Construction Yards

There are 12 construction yards proposed along the route of the Project for a variety of purposes and durations to support construction activities in the vicinity. Construction yard locations and boundaries are shown in maps in Appendix C.

All yards will be fully fenced and made secure. Site establishment activities will include site clearance, ground preparation, and establishing erosion and sediment control measures prior to any construction activities occurring. Upon completion of the works, the construction yards will be disestablished and the areas reinstated (refer to the Open Space Mitigation Report).

In general, the construction yards will operate during daytime from 6am to 7pm Monday to Saturday, and 8am - 3pm on Sunday (to allow receipt of materials and plant for the upcoming week work, and to undertake maintenance work on equipment).

As night time works are required on occasions across all of the Sectors, access will be required to yards at night.[6] As such perimeter lighting will be required; this will be designed to meet relevant council bylaws and standards. While the construction yards for the deep tunnel (Yards 6, 7, 9 and 10) will be active 24 hours a day, 7 days a week, the night time works within these yards will be limited, as the majority of work will be undertaken underground.

[6] Night access will be for those activities specified in Section 2.1.2

2.1.4 Sensitive Receptors and Receiving Environments

A number of sensitive receptors and receiving environments are near or within the vicinity of the construction footprint as shown in Table 2.1 and maps included in Appendix C. Construction activities have the potential to affect human health, cause nuisance to humans and to adversely affect the aquatic and terrestrial receiving environments. Sub-plans outlining practices to minimise these effects are detailed below.

Human Health/ Nuisance Effect

The risk of the Project impacting on human health and causing nuisance to humans applies across the entire Project footprint. This risk is higher where construction activities take place near sensitive receptors including education facilities such as schools, early childhood centres and tertiary providers, and residents and hospitals.

Mitigating the risk of potential effects on human health and nuisance from construction activities is to take place through the implementation of this CEMP and its sub-plans. This is summarised in Figure 2-2 overleaf

Aquatic Receiving Environments

A number of freshwater and marine aquatic receiving environments exist across the sectors as shown in Table 2.1. These include the Henderson Creek, Pixie Stream, Whau River, Waterview Inlet, Waitemata Harbour, Meola Creek and Oakley Creek. These aquatic environs are potentially susceptible to adjustments in water quantity from a decrease in stream baseflows and stormwater attenuation and water quality from discharges of sediment, contaminants and contaminated groundwater generated by the construction activities. Mitigation of these potential effects on the aquatic receiving environment will be implemented through this CEMP and its sub-plans as summarised in Figure 2-3.

Terrestrial Receiving Environments

Terrestrial receiving environments exist across the Project footprint (Table 2.1) which supports significant trees and vegetation, native skinks and bird roosting areas. These environs have the potential to be impacted by construction activities that generate dust, noise and vibration, and result in the removal of vegetation. Mitigation of these potential impacts is implemented through this CEMP and its sub-plans as summarised in Figure 2-4. The Ecological Management Plan details the management and monitoring of the skinks, birds and vegetation as opposed to the management of construction activities that may impact upon it.

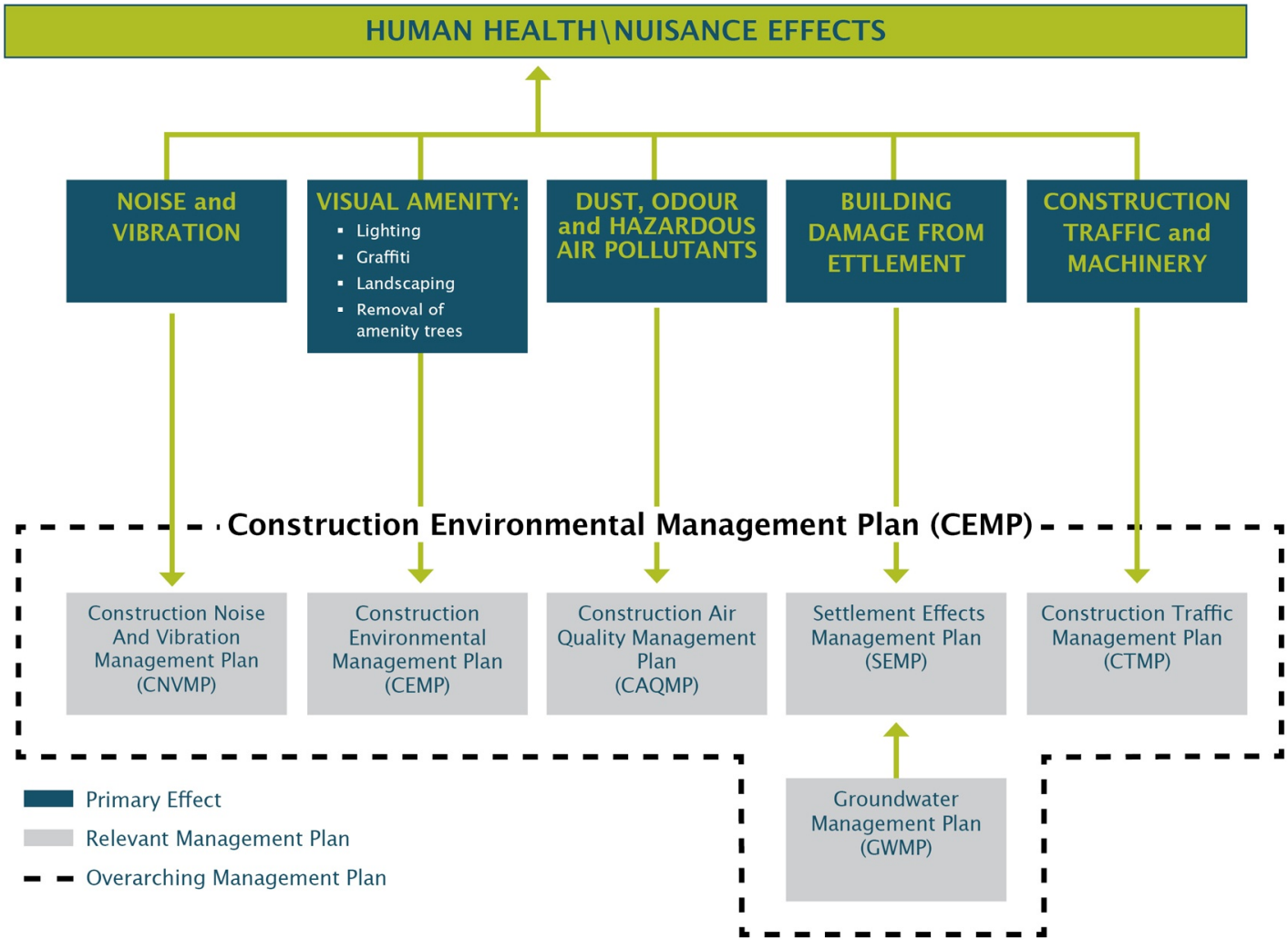

Figure 2-2 Relevant sub-plans which detail mitigation of potential impacts from construction activities on sensitive receptors

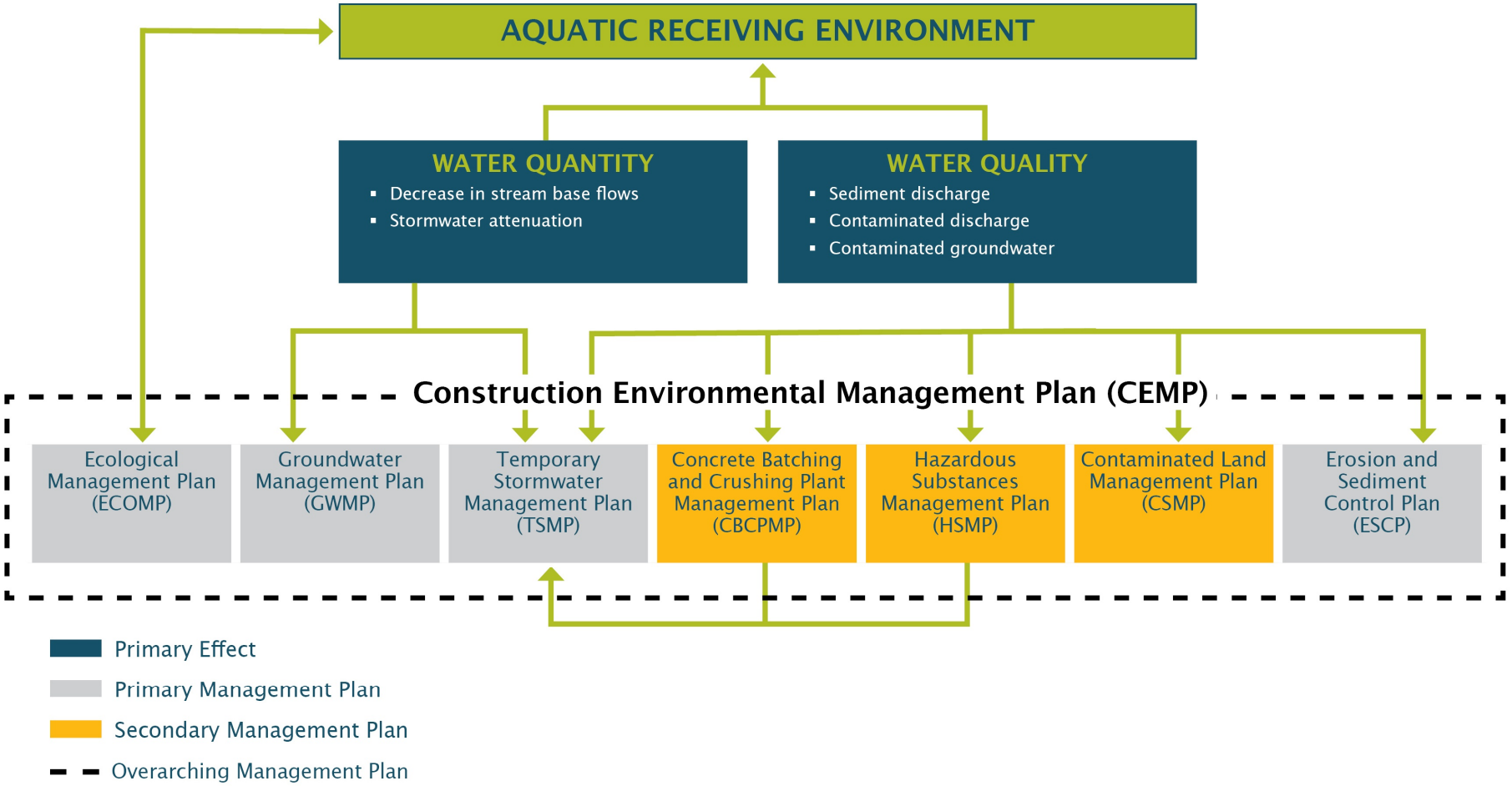

Figure 2-3 Relevant sub-plans which detail mitigation of potential impacts from construction activities on the aquatic receiving environment

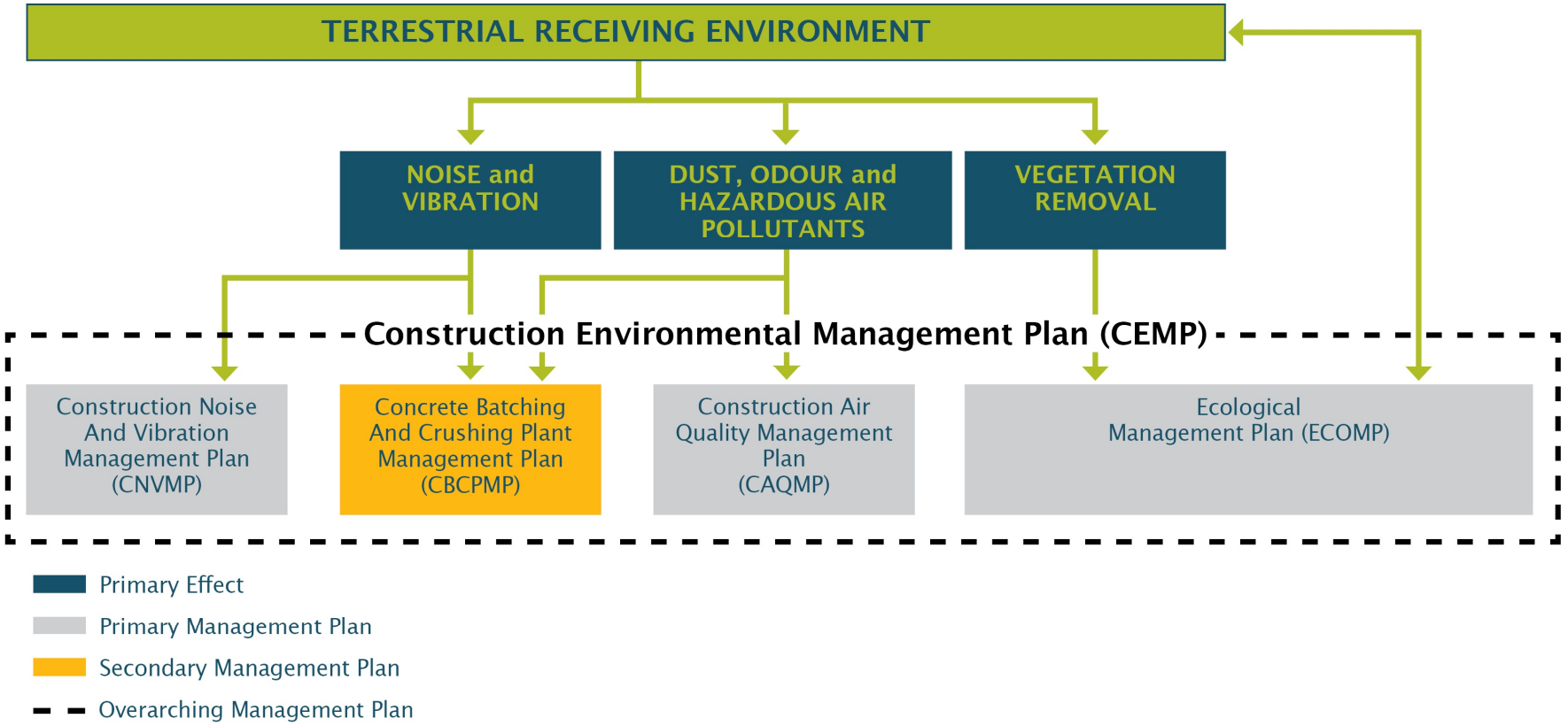

Figure 2-4 Relevant sub-plans which detail mitigation of potential impacts from construction activities on the terrestrial receiving environment

2.2 Environmental Risk Register

The Contractor will prepare an Environmental Risk Register for the construction phase of the Project. Appendix A contains a template of the register for the contractor to populate.

The Risk Register will be prepared and maintained using the following process:

1) All Project activities will be described including subcontractor, suppliers and ancillary works such as materials transported to or from site and site establishment.

2) Actual and potential environmental impacts associated with each activity will be identified.

3) Significant potential environmental impacts will be identified using the NZTA Risk Assessment[7] methodology.

4) This information will inform the design of environmental management activities, controls and monitoring to prevent or minimise those environmental impacts appropriately.

The function of the risk assessment is to ensure that the findings of the AEE and conditions of designations and consents are effectively translated into actual construction techniques. The environmental risk analysis process is outlined in the NZTA document "Risk Management Process Manual" *(2004)*[7] which is consistent with the New Zealand Standard AS/NZS 4360:2004 Risk Management. The risk analysis is based on an index formed from perceived likelihood of an occurrence and the subsequent consequence of that occurrence (how much harm it would cause). Likelihood and consequence are given a rating and a description. The overall risk score and category (ranging from negligible to extreme) is calculated from Tables A, B and C in Appendix B taken from the "Risk Management Process Manual" *(2004)*[7].

2.2.1 Review of the Register

The Environmental Manager (roles and responsibilities are defined in section 3.1.2) is required to maintain and review the Environmental Risk Register. The risk assessment results will be reviewed at regular intervals and will be repeated at critical times within the Project, such as prior to commencement of construction (taking into account finalised construction methodologies), when there is a new or changed activity, equipment or location of activities or when there is a change to legislative or consent and designation requirements. The Register will be reviewed on a quarterly basis as a minimum

The Environmental Manager, with the assistance of environmental and technical experts, will determine whether the CEMP and sub-plans require revision to reflect the revised risk assessment. The contractor will be responsible for obtaining [Auckland Council] approvals required (if any) prior to commencing any new or changed activities.

The Environmental Manager will inform the Site Manager, relevant staff, Project Manager and management team of any changes to the Environmental Risk Register. The contractor will include any variations to the register within the weekly report to the Project Engineer.

[7] NZ Transport Agency New Zealand Risk Management Process Manual Version 3, September 2004.

2.3 Legislative and Other Requirements

This section details the statutory framework and other requirements for environmental management on the Project and outlines the relevant legislation, policies and plans. Conditions of consent and designation will be included as a schedule within this CEMP once the Project approval is obtained.

A full statutory assessment and overview of statutory requirements of the potential effects upon the environment are contained within the Assessment of Environmental Effects.

2.3.1 Project Approval Process

Applications for resource consents and designations for the Project are being lodged with the Environmental Protection Authority (EPA), requesting that the Minister for the Environment defines the Project as a Proposal of National Significance. The Project requires designations under both the Auckland City and Waitakere City District Plans and resource consents under the relevant Auckland Regional Council's Regional Plans.

The provisions within this CEMP will be required to be complied with as a condition of the designations and resource consents. When the resources consents and designations are finalised, their conditions will form part of the CEMP. Consequently, the CEMP will take priority over any terms and specifications contained within any contractual documents between the NZTA and any other party (i.e. the contractor). Compliance with the conditions of consent and designation is to be required in the relevant contracts. The contractor will take responsibility for maintaining compliance with the conditions of consent and designation and this will be tracked by the NZTA thought the web based CS-VUE Compliance Database.

The NZTA, as the designation and consent holder, will be responsible for obtaining new or altered consents and designations required during construction and for obtaining approvals to renew expiring consents (if any). Alterations of consents and designations will be associated with changes to construction techniques or natural environmental changes. To facilitate this, an internal review and approval process is to take place between the contractor and the NZTA.

2.3.1.1 Notices of Requirement

The NZTA is a Requiring Authority as defined in the RMA. As such the NZTA has a mandate to designate land for the State highway network in accordance with its statutory functions.

The Waterview Connection Project is the subject of Notices of Requirement (NORs) to designate land both as new designations and as alterations to existing designations. NORs are required in both the Auckland City and Waitakere City District Plans. Four new designations are being applied for and three existing designations are being altered. Dependant on the outcome of the approval process, the confirmed designations will provide for land uses needed to give effect to the NZTA's requirement to construct, maintain and operate the State highway network.

A description of the proposed NORs, explanation of their division and a map showing their areal extent is provided within the Assessment of Environmental Effects.

2.3.1.2 Resource Consents

Activities not authorised by a relevant regional plan will require resource consents. Resource consents required for the construction of the Project are described in Part B, Chapter 7 of the Assessment of Environmental Effects.

The following is a summary of the types of resource consents applied for to enable construction of the Project under the current regional plans. These consents are required pursuant to sections 9, 12, 13, 14 and 15 of the RMA.

- Auckland Regional Plan: Coastal – works in the coastal marine area (CMA) including reclamation within the CMA, occupation by structures, works and activities in the CMA, construction of structures within the CMA and discharge into the CMA.

- Transitional Regional Plan – diversion and discharge of stormwater from impermeable areas into the watertable of a road or to a watercourse.

- Proposed Auckland Regional Plan: Air, Land and Water – works within a watercourse such as to divert and discharge surface water and the placement of structures in a watercourse, the discharge of stormwater and groundwater to land and / or water and for the disturbance of contaminated sites.

- Auckland Regional Plan: Sediment Control – land disturbance activities and sediment control.

2.3.1 National Legal Requirements and Policies

Construction of the Project must comply with a range of national legislation, regulations, strategies and policies in order to provide for the management of environmental effects. Key documents, national environmental legislation and regulations relevant to the NZTA and the Project are outlined in Table 2.2.

Table 2.2 Key national legislation, regulations and standards

National legislation, regulations, strategies and policies
Resource Management Act, 1991;
Land Transport Management Act, 2003;
Hazardous Substances and New Organisms Act, 1996;
Dangerous Goods Act, 1974 and Regulations;
Protected Objects Act 1975 for the relevant archaeological and heritage standards/practices;
Historic Places Act, 1993;
New Zealand Coastal Policy Statement 1994 (NZCPS: 1994);
Government Policy Statement on Land Transport Funding 2009/10 – 2018/19 (GPS);
National Environmental Standard – Air Quality 2004 (NES: AQ);
The Hauraki Gulf Marine Park Act, 2000;
Reserves Act 1977;
Marine Reserves Act 1971
Public Works Act 1981;
Wildlife Act 1953;

2.3.2 Relevant Planning and Policy Documents

Within the Auckland region there is a framework of planning documents that are relevant to the Project as illustrated in Figure 2.5 below.

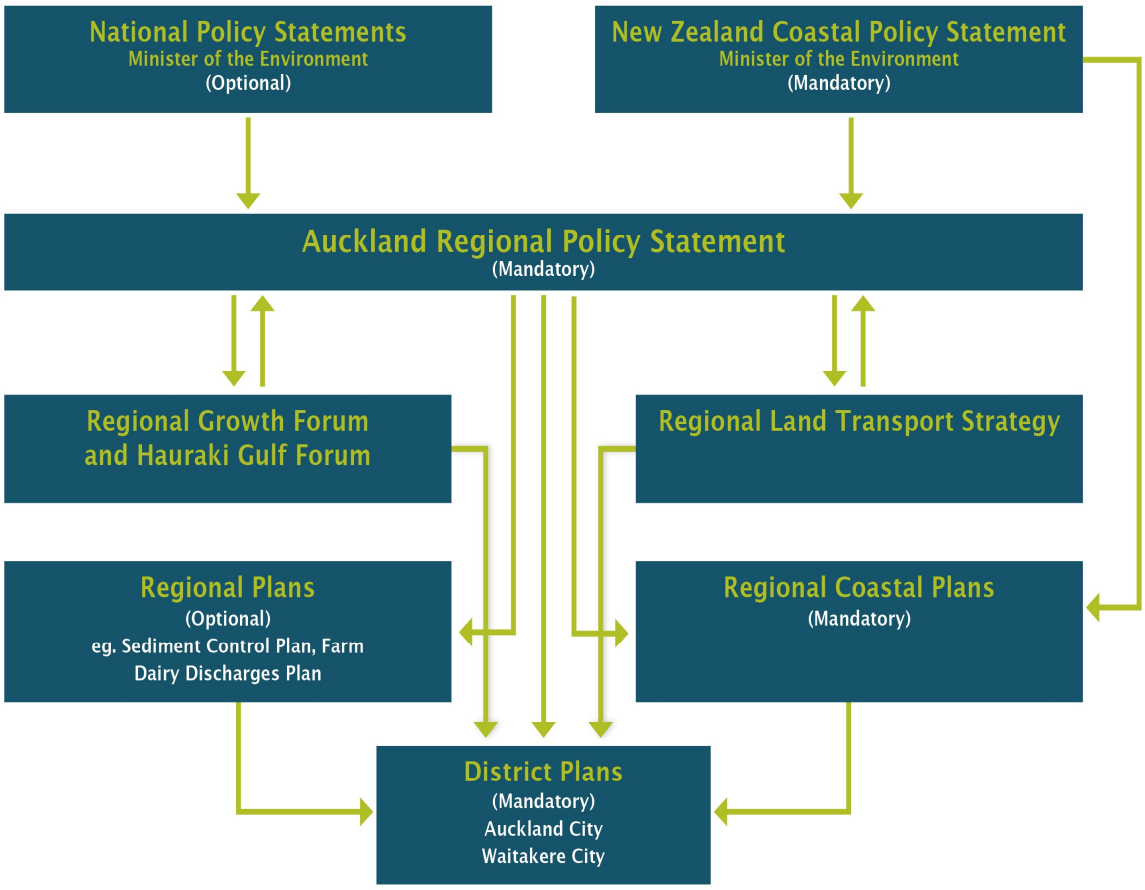

Figure 2-5 Policy Statements and Plans in the Auckland Region

2.3.2.1 Regional Policy Statement, Regional Plans and Technical Publications

The following regional policy and planning documents are relevant to the Project.

- Auckland Regional Policy Statement 1999 and Plan Change 6, Plan Change 8, to the Auckland Regional Policy Statement ;
- Transitional Regional Plan, 1991;
- Auckland Regional Plan: Coastal (ARP: C) 2004; Variation One and Plan Change 4;
- Auckland Regional Plan: Sediment Control (ARP: SC) 2001; and
- Proposed Auckland Regional Plan: Air, Land and Water (PARP: ALW) 2005.

Auckland Regional Council (ARC) has developed a set of technical publications. Although these are non-statutory, they are used to give effect to rules within the relevant regional plans. Technical publications relevant to the Project are described below in Table 2.5.

2.3.2.2 District Plans

District Plans contain objectives, policies and rules to manage the effects of land use, including traffic and noise. The Project is within the jurisdiction of two district plans. These plans have different rules governing what activities may be undertaken without the need for a resource consent or Outline Plan of Works (OPW).

The relevant district plans are:

- Auckland City Operative District Plan – Isthmus Section 1999; and
- Waitakere City Council Operative District Plan 2003.

2.3.3 Legislation, Standards and Guidelines relating to Environmental Aspects

Table 2.3 below identifies legislation, standards and guidelines, in addition to those listed in section 2.3.2, which are relevant to specific environmental aspects of the Project and will be read in conjunction with relevant sub-plans of this CEMP:

Table 2.3 Summary of the standards, guidelines and specific statutory requirements associated with environmental aspects and detailed in the sub-plans

Environmental Aspect / Sub-Plan	Sub-plans Statutory requirements, Guidelines and Standards
Noise and Vibration – CNVMP	• NZS 6803:1999 Acoustics – Construction Noise • DIN 4150-3:1999 Structural Vibration (German standard) • BS 5228:2009 Code of Practice for Noise and Vibration Control on Structures (British Standard) • NZS 6801:1991 Measurement of Sound • NZS 6802:1991 Assessment of Environmental Sound
Air Quality - CAQMP	• Ministry for Environment, Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions 2001
Stormwater Management - TSMP	• Auckland Regional Council – TP90 - Erosion and Sediment Control Guidelines for Land Disturbing Activities • Auckland Regional Council – TP10 – Design Guideline Manual Stormwater Treatment Devices • The NZTA 2010 – Response to Spills Arising from Transport Incidents on the State Highway Network

Environmental Aspect / Sub-Plan	Sub-plans Statutory requirements, Guidelines and Standards
	• Auckland Regional Council – Stormwater Compliance Inspection Advice
Ecology - ECOMP	• Auckland Regional Pest Management Strategy 2007 – 2010 (RPMS) • NZS 8409:2004 Management of Agrichemicals
Groundwater-GWMP	• ANZECC Fresh Water Guidelines
Contamination - CSMP	• Ministry for Environment A Guide to the Management of Cleanfills 2002 • Health and Safety in Employment (Asbestos) Regulations 1998 • Department of Labour Guidelines for the Management and removal of Asbestos (revised) 1999
Hazardous substances -HSMP	• Hazardous Substances (fireworks, safety ammunition, and other explosives transfer) Regulations 2003 no. 2003/176 • Hazardous Substances (Tank Wagons and Transportable Containers) Regulations 2004 • Land Transport Rule 45001/1 and 45001/2: Dangerous Goods 2005 • AS/NZ 2430.3 Classification of Hazardous Areas • AS 2430.1:1987 Classification of Hazardous Areas – Explosive Gas Atmosphere • NS 6101.1:1998 Classification of Hazardous Areas – Flammable Gas and Vapour Atmospheres • AS/NZS 238 and AS/NZS 61241.1.2 Electrical Installations in Hazardous Zones • Land Transport Rule 45001/1 and 45001/2: Dangerous Goods • The NZTA – Standard Operating Procedure for Response to Spills Arising from Transport Incidents on the State Highway Network
Construction Traffic - CTMP	• The NZTA Traffic Control Devices Manual • Auckland City Council Manual of Temporary Traffic Management
Concrete Batching and Rock Crushing – Dust, Stormwater and Noise - CBCMP	• National Environmental Standard for Air Quality (AQNES) • Auckland Regional Council – TP152 – Assessing Discharges of Contaminants into Air (Draft) 2002 • Auckland Regional Council – TP10 – Design Guideline Manual Stormwater Treatment Devices • NZS 6803:1999 Acoustics – Construction Noise
Land Disturbing Activities – ESCP	• Auckland Regional Council – TP90 Erosion and Sediment Control Guidelines for Land Disturbing Activities
Archaeology - ASMP	• Historical Places Act 1993

2.3.4 The NZTA's Policies and Plans

The NZTA's policies and plans direct environmental management and align it to national legislation, regulations and policy. The NZTA's Environmental Plan implements the NZTA Strategic Plan and the NZTA National State Highway Strategy. Together these documents provide the link between relevant government policies and legislation. Other guidelines that are applicable to environmental management on the Project are listed below:

Table 2.4 Summary of relevant NZTA policies, plans, standards and guidelines

The NZTA Policies, Plans, Standards and Guidelines	Purpose
National State Highway Strategy, 2007	To provide a 30 year view and a link between the NZ Transport Strategy, the Land Transport Management Act, and the NZTA's plans and policies. It sets out the NZTA's eight principles for planning, building, operating, and managing the state highway network.
Strategic Plan, 2004	To reflect the areas of strategic emphasis for the NZTA.
Environmental Policy Manual, 2005	To outline the environmental management objectives that the NZTA is committed to delivering.
Environmental Plan, 2008	To implement the NZTA's environmental policy by developing approaches and implementation plans for defined categories of environmental and social impacts.
Waste and Energy Management Policy, 2003	To establish a framework to promote the sustainable operation of the state highway networks and encourage innovation through waste and energy management.
Stormwater Treatment for Road Infrastructure – Standard, 2009	To provide greater clarity and consistency between highway and network operations, consultants and consenting authorities.
Guidelines for Highway Landscaping, 2006	To set the NZTA's expectations for highway landscaping, and provide information on how to reach achieve these expectations. The guideline will ensure all relevant aspects are considered, leading to optimal design and improved environmental outcomes.

2.3.4.1 The NZTA and Environmental Management Planning

The contractor is to undertake environmental management planning with reference to the NZTA Contractor's Social and Environmental Management Plan Z/4. The final CEMP applied during the construction phase will be consistent with the social and environmental assessment developed for the Scheme Assessment Report, which is consistent with NZTA's Environmental Plan as required in the Investigation and Reporting Phase of all NZTA projects.

2.3.4.2 The NZTA Consent Compliance Management System

CS-VUE is a legal compliance system adopted by the NZTA to manage environmental statutory requirements. It is the NZTA's contractual requirement for the contractor who is undertaking compliance with legal obligations such as resource consents, designation conditions, Department of Conservation concessions, Historic Places Trust authorities and any other agreements or obligations which have compliance conditions.

CS-VUE is a secure database which matches each consent (or other legal obligation) with a consent manager and condition manger and automatically sends an email notifying them of compliance requirements. All entries/changes on CS-VUE are annotated with the persons name and date who undertook the changes. The NZTA'S Highways and Network Operations, Professional Services team owns and maintains CS-VUE.

3. Implementation and Operation

This section of the CEMP addresses the implementation and operation of the CEMP and the sub-plans. The following areas are covered:

- CEMP Management Structure and Responsibility;
- Training
- Environmental Maps
- Operating Procedures inclusive of mitigation measures
- Emergency Contacts and Response
- Communication and Interfaces
- Complaints Management

3.1 CEMP Management Structure and Responsibility

3.1.1 Overview of Responsibility for this Plan

Each person involved in the Project has equal responsibility to strive to avoid, remedy or mitigate adverse environmental effects. There are three key groups with responsibility for environmental management of the Project:

- The NZTA as the Project owner and holder of the designations and resource consents;
- The contractors undertaking the works; and
- The [Auckland Council] who audits the works and monitors compliance with resource consent and designation conditions and the specific CEMP's.

During the construction phase of the Project, an Environmental Manager will be appointed by the contractor as part of the Construction Team who will be involved throughout the contract period to give advice and to ensure that the CEMP and sub-plans are implemented and maintained. Further details of responsibilities during the construction phase are included below.

Once the construction of the Project is complete, the responsibility for its management is passed within the NZTA from the construction contractor, termed the 'Capital Works Team' within the NZTA, to the Operations and Maintenance Contractor (OMC) v , thus becoming part of the Auckland motorway network.

The main construction contractor(s) is responsible for the transition phase between construction and operational phases. The contractor is responsible for working with the construction team to sign off construction and post construction resource consent and designation conditions, handover of environmental monitoring data and reports and compliance and audit reports before the Project is handed to the OMC.

3.1.2 Specific Roles and Responsibilities

The key management roles in relation to environmental management during the construction of the Project are outlined in Table 3.1:

Table 3.1 Environmental management responsibilities

Organisation	Role	Responsibilities
The NZTA	Consent Holder and Engineer to the Contract Environmental Representative	• Compliance with the RMA and with any condition of the designations and resource consents. • Applications for alterations or new resource consents and designations and renewal of expired consents associated with changes to construction techniques or natural environmental changes. • Review of contractors' site specific CEMPs, and relevant sub-plans.
Main contractors	Project Manager Environmental Manager Construction Manager	• Overall responsibility for site environmental management. • Reviewing and reporting on environmental performance. • Inspection of works to assess compliance with the CEMP and sub-plans. • Inspections, auditing and checking of environmental management practices and procedures • On-site compliance with consent and designation conditions and other requirements and tracking compliance information on CS-VUE • Report to the NZTA changes to construction techniques or natural environmental changes which require alterations or new resource consents and designations. • Prepare, review and update of specific CEMP's and relevant sub-plans. • Facilitate and oversee environmental monitoring. • Update and maintain the Environmental Risk Register.

Organisation	Role	Responsibilities
		• Maintain Complaints, Incidents, and Non Compliance forms (Appendix Q). • Training of all staff including subcontractors.
Subcontractors	Construction Manager	• Adherence to the CEMP and sub-plans. • Preparation/ variation of specific CEMP's, and relevant sub-plans as required.
[Auckland Council]	Consents Manager	• Commenting on specific CEMP's, and sub-plans • Auditing to assess that consent and designation conditions are being met.

Key roles of personnel as they relate to environmental management during the construction of the Project are detailed below. Roles and responsibilities of personnel which implement specific environmental controls and monitoring programmes (such as the contaminated land expert, arborist and archaeologist) are detailed in the relevant sub-plan.

All Staff

- Attending tool-box talks and environmental training including familiarisation with the requirements of the CEMP and sub-plans (as directed by the Trainer);
- Responsible for reporting environmental incidents, complaints, defects and other problem areas to senior staff as they arise on site;
- Ensuring that required processes and procedures for environmental management are followed;
- Ensuring that environmental mitigation and protection measures are maintained and working correctly; and
- Within day to day work responsibilities, ensure the environment both on site and adjacent to the site is protected and respected.
- Ensure the site is tidy and all litter is placed in bins

Project Manager

- Takes ultimate responsibility for compliance with specifications of resource consent and designation conditions;
- Reviews, updates and approves environmental plans prior to issue; and
- Ensures adequate resources are provided to ensure environmental issues and obligations are appropriately managed.

Design Manager

- Incorporates environmental requirements into design as required by consent and designation conditions and the CEMP and sub-plans; and
- Advises Environmental Manager of any design issues that may impact on the environment.

Project Engineers

- Provides leadership to the site team to achieve Project environmental objectives and targets to ensure a high level of performance is achieved;
- Responsible for ensuring environmental controls and erosion and sediment control works are installed, modified and maintained as appropriate for each stage of construction;
- Assist in the development, implementation and review of Project environmental objectives; and
- Ensures staff on-site are aware of environmental requirements at all times and sees that routine maintenance to erosion sediment control facilities and management measures continue with ongoing effectiveness.

Construction Managers

- Reviews work packages against Project environmental objectives and targets and CEMP to ensure a high level of performance is achieved;
- Develops, implements and monitors construction methods ensuring compliance with consents and designations and CEMP and sub-plans;
- Coordinates environmental interfaces with consultants, subcontractors and suppliers;
- Comply with all Legislation, Regulations designation and consent conditions in relation to the work they are undertaking;
- Demonstrate understanding of major environmental and community issues and environmentally sensitive areas;
- Implement environmental protection measures in accordance with the contract and the CEMP and sub-plans;
- Train all workers in relation to environmental measures;
- Report all incidents, system defects and complaints to the Site Supervisor; and
- Ensure all workers and others (e.g. subcontractors and suppliers) comply with environmental operating procedures and community relations protocols.

Environmental Manager and Team

- Provides leadership to ensure staff are motivated to achieve environmental standards, and comply with all resource consent and designation conditions;
- Develops, implements and reviews environmental management systems including the CEMP and sub-plans for the Project;
- Co-ordinates the interfaces and communications with external agencies and stakeholders in relation to environmental management on the Project in conjunction with Stakeholder Manager;
- Manages and co-ordinates all consents and designations required (current and any additional), and construction monitoring and maintains and submits relevant reporting and records to the [Auckland Council] and the NZTA, as required;
- Undertakes regular site inspections and audits to ensure compliance with the CEMP and sub-plans and consent and designation conditions;
- Input all environmental monitoring results to a CS-VUE database;
- Provides liaison point between site staff and arborist/subcontractors with regard to tree protection / removal;
- Coordinates site archaeological monitoring and protection requirements and provides necessary training and advice to site staff;
- Coordinates all site monitoring including but not limited to groundwater, settlement, water quality, ecological, dust, noise, and vibration monitoring and provides necessary related training and advice to staff in relation to this monitoring;
- Trains staff in site specific environmental procedures;
- Coordinates environmental emergency responses;

- Notifies Project Manager and [Auckland Council], Historic Places Trust and/or the Department of Conservation of any significant environmental non compliances for which they have jurisdiction;
- Responsible for resolving issues of environmental non compliances;
- Coordinates green house gas (GHG) reduction initiatives, carbon foot printing & reporting;
- Coordinates the preparation of erosion and sediment control plans and preparation of as-built information that is timely and applicable to the consent conditions;;
- Manages maintenance and monitoring of the effectiveness of erosion and sediment controls, stormwater devices and other control devices; and
- Ensures spill kits are available and stocked and provides training on equipment use.

The NZTA Environmental Representative

- Non compliance reporting to [Auckland Council] in a timely manner;
- Review CEMP and sub-plans, Complaints Register, Incidents and Emergency Register, Non Compliance Report, Environmental Performance Report;
- Site visit and meet monthly with Environmental Manager and Site Manger to discuss non compliance, complaints, incidents and emergencies, monitoring, auditing and review of the CEMP and sub-plans;
- Reporting to the NZTA Project Manager; and
- Overview Environmental Managers use of CS-VUE.

Stakeholder Manager

- Coordinates interfaces with external agencies and stakeholders ensuring all contract commitments within resource consents, designations, and notices of requirement are met;
- Responsible for notifying residents of works occurring within the near vicinity and managing mitigation as required;
- Disseminates information to the public as approved by the NZTA; and
- Primary contact for Project related complaints and enquiries.

Site Manager

- Provides leadership to the site construction team to achieve Project environmental objectives and targets;
- Ensures that the CEMP and sub-plans are implemented appropriately;
- Ensures environmental controls and erosion and sediment controls are protected and maintained on a day to day basis;
- Leads the emergency response crew;
- Ensure staff on site are aware of GHG requirements and initiatives;
- Reviews and authorises the closures of site access points to reduce the risk of dirt on roads; and
- Reviews the need to use a water cart to control dust.

Site Specific Managers

- Report directly to the Construction Manager and inform the Project Manager on all environmental and community matters;
- Ultimately responsible to ensure that the CEMP is implemented on-site;
- Ensure that all on-site personnel have undertaken the community and environmental site induction training prior to the commencement of works;
- Ensure that all contractors comply with environmental protection programs appropriate to their activities;
- Ensure that all contractors comply with community relations protocols and procedures;
- Ensure compliance with any resident agreements and commitments;

- Conduct regular site inspections, at least weekly and following rain events, of the site, surrounding areas and contractors activities;
- Record and action System Defects (i.e. spills, incidents and complaints) when required; and
- Liaise directly with Environment Manager and Stakeholder Manager on the day-to-day management of sites.

Foreman – with Environmental Responsibilities

- Manages the construction of critical erosion and sediment control devices, temporary stormwater ponds and removal of vegetation;
- Co-ordinates daily site inspections of environmental controls including erosion and sediment control devices and co-ordinates maintenance where necessary;
- Monitors the site during rainfall events and high wind events; and
- Ensure staff on site are aware of environmental requirements at all times.

3.1.3 Contact Details

Contact details for those with key responsibilities in the implementation of this CEMP will be provided in Appendix Q.

3.2 Environmental Training and Induction

3.2.1 Employees and Subcontractors

All Project staff (contractors and subcontractors) will undergo general environmental awareness training and training about their responsibilities under the CEMP and sub-plans. The training will ensure that all personnel understand their obligation to exercise due diligence for environmental matters. Suitable induction training and ongoing programmes of environmental training will, as a minimum, include:

- The significant environmental impacts, actual or potential and the importance of mitigation.
- Location of sensitive receptors and areas of high environmental value.
- Importance and relevance of the CEMP and sub-plans.
- Consent and designation requirements.
- Roles and responsibilities in relation to compliance with consents and designations, permits and operating procedures.
- Familiarisation with site environmental controls.
- Spill response and emergency procedures.
- Hazard and risk management to ensure personnel understand the potential impacts and proposed mitigation measures.
- Accident, incident, spill reporting and methods for environmental prevention.

- Complaints management procedures.

- Environmental Monitoring.

A comprehensive environmental induction will be provided to all staff and subcontractors prior to starting work on site. The induction will include information on the surrounding natural environment and its sensitivity. Information will be provided on environmental controls such as sediment control devices, noise and dust mitigation measures, spill contingency plans and waste management. Site engineers responsible for writing work plans and undertaking site specific safety and environmental risk assessments will also be given guidance on how to assess and plan for environmental issues using the CEMP and Environmental Risk Register.

Environmental issues will form a regular part of toolbox meetings (to be attended by contractor staff and subcontractors) to ensure all workers are aware of the key issues. Opportunities will also be made available for selected staff members to attend erosion and sediment control training courses where available.

Site staff will be made aware of the operational restrictions when working near designation boundaries, sites of archaeological and cultural significance, sensitive aquatic receiving environments, areas of retained/protected vegetation and other sensitive receptors to the nuisance effects of noise, dust, light and vibration.

3.2.2 Visitors

Special shortened inductions may be provided for visitors to the Project where there is minimal potential for environmental harm. All visitors must undergo a visitor's induction. Subcontractors are responsible for the actions and conduct of their visitors, and will ensure that visitors obey all environmental requirements of the site. Visitors will be accompanied at all times. Under no circumstances will a visitor undertake any physical work on site.

3.2.3 Training Resources and Records

Training resources support and provide ongoing education for on-site personnel and site visitors in regard to environmental matters. These resources will be used to communicate up to date methods, hazards and environmental awareness where specific training is not deemed necessary.

Training records in regard to environmental training will be maintained on site by the Environmental Manager and submitted 6 monthly to the NZTA Human Resources representative on request. Records will include:

- Who was trained;
- When the person was trained;
- The name of the trainer; and
- General description of training content.

3.3 Environmental Maps

A series of GIS layers have been developed into maps to show locations of project boundaries, construction activities, sensitive receptors controls and mitigation measures. The maps will be updated and refined further by the contractor to reflect changes to construction activities, mitigation measures and results of monitoring. These maps are to be used by the contractor as a tool for inductions, tool-box sessions, and training and for general display in site offices. Appendix C contains examples of these maps. The GIS layers that the maps are comprised from are listed below.

Location of Construction Activities relative to Human Health and Nuisances Values

- Sectors
- Proposed construction foot print
- Proposed construction yard boundaries
- Proposed location of bentonite, crushing and concrete batching plants.
- Motorway alignment
- Receptors to impacts from dust, noise and vibration (blasting).
- Archaeological sites

Location of Construction Activities Relative to Aquatic Receiving Environments

- Sectors
- Proposed construction foot print
- Proposed construction yard boundaries
- Proposed location of bentonite, crushing and concrete batching plants.
- Contaminated land hotspots
- Indicative Construction Stormwater & Sediment Retention Ponds
- Open stream channels
- Marine reserve

Location of Construction Activities Relative to Terrestrial Receiving Environments

- Sectors
- Proposed construction foot print
- Proposed construction yard boundaries
- Proposed location of bentonite, crushing and concrete batching plants.
- Indicative Construction Stormwater & Sediment Retention Ponds
- Location of skinks
- Significant saline and terrestrial vegetation
- Bird roosting sites

The maps are not intended to be used outside the functions of the CEMP. For up-to-date details on information presented in the GIS layers from which these maps are comprised, refer to the relevant assessment reports listed in section 1.3.3.

3.4 Operating Procedures

The following sections of the CEMP describe the environmental aspects associated with the construction phase of the proposed works along with the operational controls and mitigation measures. Sub-plans that detail the controls and measures are cross-referenced

3.4.1 Noise

The Project will create changes to the existing noise environment during construction. As such the noise mitigation methods as set out in this CEMP will remain consistent with the Noise Objectives (associated with construction noise) as set out in Section 2.1 of the NZTA's Environmental Plan:

N2	Determine reasonable noise requirements when seeking new or altering existing designations including when designating existing local roads by using RMA procedures.
N3	Manage construction and maintenance noise to acceptable levels.
N4	Influence activities adjacent to state highways to discourage noise-sensitive activities establishing in areas adversely affected, or likely to be in the future by state highway traffic noise.
Performance Indicator	Cumulative increase in vehicle-kilometre-travelled affecting sensitive receiving environments near state highways in urban and peri-urban areas treated with road surfaces that are quieter than a grade 2 chip seal.

Significant numbers of noise generating machinery will be operating in relatively close proximity to noise sensitive receptors. The New Zealand Standard NZS 6803:1999 "*Acoustics – Construction Noise*" contains limits which are generally applied to temporary construction projects. These limits are applied at a distance of 1 metre from nearby facades.

Night-time construction is required in certain areas. Throughout the construction phase, noise effects must be carefully managed through the use of management plans. NZS6803:1999 provides for the application of alternative night time construction criteria where the existing ambient noise level is raised due to extraneous noise sources, based on a "background plus 10 dB" approach. This approach is used to determine an LAeq noise limit by adding 10 dB to the measured LA90 noise levels.

Mitigation and monitoring of noise during the construction phase is detailed in the Construction Noise and Vibration Management Plan (CNVMP) in Appendix D.

A Concrete Batching and Crushing Plant Management Plan (CBCPMP) included in Appendix O details the mitigation and monitoring of noise specifically generated by the operation of concrete batching plants and a rock crusher. This is addressed in more detail in Section 3.4.12 of this CEMP.

3.4.2 Vibration

The vibration mitigation methods as set out in this CEMP will remain consistent with the Vibration Objectives as set out in Section 2.11 of the NZTA's Environmental Plan:

V1	Plan and design new state highways to avoid or reduce adverse vibration effects.
V2	Mitigate vibration where levels are unreasonable and exceed relevant criteria set in New Zealand or internationally accepted thresholds.
V3	Avoid or reduce, as far as is practicable, the disturbance to communities from vibration during construction and maintenance.
Performance Indicator	None exist at this time

Significant numbers of high-vibration generating machinery will be operating in relatively close proximity to vibration sensitive receptors. Night-time construction is required in certain areas. Two construction vibration standards have been adopted for use in this Project: DIN 4150-3:1999 and BS 5228:2009. These standards address building damage risk and human response to vibration respectively.

Throughout the construction phase, vibration effects must be carefully managed through the use of the Construction Noise and Vibration Management Plan (CNVMP) in Appendix D.

3.4.3 Air Quality

During the construction phase of the Project there is potential for air to be polluted by contaminants such as dust, odour and hazardous air pollutants (HAP). Section 2.2 of the NZTA's Environmental Plan recognises this and requires that the NZTA's consultants and contractors employ good management practices. The following specific methods to implement this are identified on p.31 of the NZTA's Environmental Plan, as follows:

Ensure Construction Management Plans, or equivalent, include an air quality management component. These should detail consultant and contractor obligations during the construction phase in relation to:

- *Monitoring and reporting requirements including results of risk assessments and any air pollution measurements, for example, in relation to dust and/or odour;*
- *Identifying appropriate dust and air pollution mitigation measures to be implemented; and*
- *Procedures for maintaining contact with stakeholders and managing dust and air pollution complaints.*

A Construction Air Quality Management Plan (CAQMP) has been prepared and is included in Appendix E. The purpose of the CAQMP is to facilitate the avoidance, remediation and mitigation of any adverse effects of dust, odour and HAP discharges generated from the construction activities and to promote proactive solutions to the control these discharges from the site.

In addition, a separate Concrete Batching and Crushing Plant Management Plan (CBCPMP) has been prepared to address all aspects of the environmental management of discharges (including discharges of dust) from concrete batching and rock crushing carried out as part of the Project. This is addressed in more detail in Section 3.4.12 of this CEMP.

Procedures for maintaining contact with stakeholders and managing complaints are given in Sections 3.5, 3.6 and 4 of this CEMP.

3.4.3.1 Dust

Dust can affect human health and plant life along the edge of the earthworks area, can be a nuisance to the surrounding public, and can contribute to sediment loads discharged to streams and other water bodies by depositing in areas without sediment control measures in place. Sediment deposited in sealed public roads can also result in a dust nuisance. Rainfall, evaporation and wind speed are meteorological conditions having the greatest effect on dust mobilisation. The dust controls are required only for the construction phase and will be a responsibility of the construction team as part of this CEMP.

3.4.3.2 Odour

There is the potential for odour to be generated from exposing contaminated land, in particular in the vicinity of the southern portal and the associated disturbance of a landfill containing household wastes. Management measures to mitigate the effects of such discharges include:

- Limiting the time that the odorous material in the excavation is exposed;
- Removing excavated odorous material from site as quickly as possible; and
- The use of odour masking agents, chemical counteractants or digestive deodorant sprays.

Complaints regarding odour from residents will be dealt with through the complaints management process detailed in section 3.6.3 of this CEMP.

3.4.3.3 Construction Machinery and Vehicle Emissions

Excessive smoke and odour from diesel-fuelled trucks, generators and other machinery is primarily caused by poor engine maintenance. Failure to maintain air filters, fuel filters, and fuel injectors to manufacturers' specifications may cause excessive black smoke and objectionable odour.

- Excessive smoke and odour discharges from trucks, earth moving machinery and generators, while unlikely, could cause complaints from neighbours under adverse meteorological conditions if vehicles and machinery are not well maintained. Contractors are required to keep trucks and machinery used on-site appropriately maintained.

- Factors considered in the selection of haulage routes include the minimisation of the effects of truck exhaust emissions and noise on surrounding sensitive areas. Because most of the Project is immediately accessible from the existing motorway network, these will be the preferred routes wherever possible. Within Sector 7 (the cut-and-cover section of tunnel), direct access to the motorway is not possible, traffic will need to travel over a relatively short section of Great North Road (a regional arterial road) to reach SH16.

3.4.4 Water Resource Management

The water resources mitigation methods as set out in this CEMP and sub-plans will remain consistent with the Water Resources Objectives as set out in Section 2.3 of the NZTA's Environmental Plan:

W1	Ensure run-off from state highways complies with RMA requirements
W2	Limit the adverse effects of run-off from state highways on sensitive receiving environments.
W3	Ensure stormwater treatment devices on the network are effective.
W4	Optimise the value of water management through partnership with others.
Performance Indicator	Cumulative increase in vehicle-kilometre-travelled where highway run-off is treated by designed solutions, such as both natural and engineered water-filtering systems before being discharged into sensitive water bodies.

3.4.4.1 Erosion and Sediment Control

An Erosion and Sediment Control Plan (ESCP) is included in Appendix F. This plan follows the principles of erosion and sediment control which are well understood by the contracting industry, and have their basis in the Auckland Regional Council's *Technical Publication 90 Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region ('TP-90').* The key principles employed by the ESCP are to undertake the proposed activities in a manner that reduces the potential for erosion of bare soils to occur (erosion control) and to employ treatment devices to treat all sediment laden water prior to discharging from the site (sediment control). By implementing the ESCP, potential impacts on freshwater and marine ecology are minimised through the devices reducing sediment discharges to waterways. The basic erosion and sediment control principles applicable to this Project are as follows:

- Minimise disturbance – Only work those areas required for the construction to take place;
- Stage construction – Plan works to minimise area of disturbance at any one time;
- Protect steep slopes – Use cut of drains, bund armouring and use of flumes as appropriate;
- Protect watercourses – Plan works to prevent sediment laden flows from entering watercourse without treatment;
- Stabilise exposed areas rapidly – Stabilise areas using a mixture of gravel, mulch and hydroseeding as appropriate;

- Install perimeter controls – Divert clean water away from areas of disturbance and divert sediment laden flows to control devices;
- Employ detention devices – Treat runoff by methods that allow the sediment to settle out;
- Update ESCP – As construction progresses the nature of the land disturbing activities change, the plan needs to be modified to reflect the changing conditions of the site; and
- Assess and adjust – Inspect, monitor and maintain control measures.

The Construction Team is to ensure that erosion and sediment control is actively managed throughout the construction phase of the Project and reflects the changing status of the Project.

The ESCP sets out the construction and environmental management and monitoring requirements in relation to land disturbing activities. Furthermore, implementation of the ESCP is important mitigation for a range of environmental aspects in particular to minimise impacts on freshwater and marine ecology.

Erosion and sediment control methodologies are detailed within the ESCP for each sector and the following specific construction activities:

- Establishment of spoil disposal areas / cut and fill operations
- Construction specific methodologies
- Dewatering
- Stream diversions and culverts, in/outlet structures
- Oakley Creek crossing
- Reclamation
- Pile installation
- Bridge works
- Cartridge vault construction
- Retaining walls
- Use of bentonite.

3.4.4.2 Temporary Stormwater Management

A Temporary Stormwater Management Plan (TSMP) is included in Appendix G. This plan covers the operation and maintenance of stormwater devices that treat stormwater runoff and discharges from surfaces that will only remain impervious during the construction phase (such as construction laydown areas). Treatment devices

have been designed generally in accordance with ARC Technical Publication 10: Stormwater Management Devices: Design guidelines manual (2003).

The TSMP details the following:

- Operating procedures of stormwater devices which are to be implemented to avoid excess stormwater runoff, sediment and contaminants in the runoff.

- Maintenance and monitoring of stormwater treatment devices to ensure optimum operating efficiencies.

Management of stormwater discharged from Concrete Batching Plants is detailed in the Concrete Batching and Crushing Plant Management Plan (CBCPMP) included in Appendix O. This is addressed in more detail in Section 3.4.12 of this CEMP.

3.4.4.3 Groundwater Management – Oakley Creek

Groundwater has the potential to flow into the tunnels excavations leading to a decrease in the baseflows in Oakley Creek. This may concentrate contaminant and sediment loads in Oakley Creek reducing the freshwater ecological quality. Monitoring and management of groundwater to minimise this potential impact is detailed in the Groundwater Management Plan (GWMP) in Appendix I. Monitoring of freshwater ecology which may be impacted is detailed in the Ecological Management Plan (ECOMP).

3.4.5 Ecological Resources

The ecological resources mitigation methods as set out in this CEMP will remain consistent with the Ecological Resources Objectives as set out in Section 2.6 of the NZTA's Environmental Plan:

E1	Promote biodiversity on the state highway network.
E2	No net loss of native vegetation, wetlands, critical habitat or endangered species.
E3	Limit the spread of plant pests.
Performance Indicator	Area of habitat loss and restoration.

An Ecological Management Plan (ECOMP) is included in Appendix H. The plan identifies construction activities which may impact on ecological resources and references and describes appropriate mitigation measures. Monitoring of ecological resources during the construction phase is detailed to measure the effectiveness of environmental controls and to provide a feedback for the adjustment of the controls. The ECOMP details management of the following ecological aspects:

- Herpetofauna (Skinks)

- Avifauna (Birds)
- Vegetation including significant trees and species
- Plant pest management
- Freshwater ecology
- Marine ecology

A number of potential effects on ecology during construction are avoided through the implementation of erosion and sediment control, noise mitigation, dust management practises, and contaminated land and spill response procedures. The ECOMP references the relevant management plans to be implemented to minimise impacts on ecology during the construction phase.

Promotion of biodiversity beyond construction will be achieved through the implementation of the Urban and Landscape Design Plan.

3.4.6 Groundwater

Construction of the tunnels will result in temporary and long term drawdown of groundwater in the vicinity of the works which might affect the existing environment in the following ways:

- Reduce Oakley Creek base flows;
- Cause ground settlement that results in damage to existing structures; and
- Spread contaminants that might reside in areas of fill.

To minimise these potential effects a Groundwater Management Plan (GWMP), included in Appendix I, details the monitoring and mitigation to be implemented. Monitoring of changes in groundwater level can give an indication of the potential for drawdown-induced settlements. The GWMP details operating procedures to reduce groundwater drawdown and impacts on Oakley Creek through the management of groundwater inflow into the tunnels which is potentially contaminated.

Management responses to settlement are detailed in the Settlement Effects Management Plan (SEMP).

3.4.7 Settlement

A Settlement Effects Management Plan (SEMP) is included in Appendix J. Inflow of groundwater into the tunnels excavation could result in consolidation settlements. Furthermore, tunnel excavation and movement of retaining walls may also result in mechanical settlements. This settlement may have an impact on structures, such as buildings and roads, and services. The SEMP details the following:

- Monitoring of consolidated and mechanical settlement; and

- Monitoring and management of structures and services that have the potential to be impacted by settlement.

3.4.8 Spill Response and Contamination

The spill response and contamination mitigation methods as set out in this CEMP will remain consistent with the Spill Response and Contamination Objectives as set out in Section 2.7 of the NZTA's Environmental Plan:

S1	Design stormwater control and retention devices that can accommodate spills in areas of high environmental risk.
S2	Ensure the removal, placement and disposal of contaminated soils is achieved in accordance with best practices.

Impacts on freshwater and marine ecology from construction activities can be minimised through the management of contaminated land, groundwater, spills and hazardous substances. These environmental aspects have the potential to contaminate runoff and enter waterways. Management of contaminated soils is covered by a Contaminated Soils Management Plan (CSMP) and management of hazardous substances and the spill response procedure is covered by the Hazardous Substances Management Plan (HSMP)

Activities that take place in the underground environment of the tunnels will be managed consistently with the activities on the surface as the risk of contaminating an aquifer from spills is similar to the risk associated with contaminating a surface water body.

3.4.8.1 Contaminated Land

The Contaminated Soils Management Plan (CSMP) included in Appendix K outlines the procedures for handling potentially contaminated soils, and contaminated materials excavated on site. This includes procedures for the contractor to follow in the event of the discovery of unexpected contaminated materials, and examples of visual and olfactory indicators of contamination. Sector specific details on the contaminants present are provided. A preliminary classification of materials at soil sampling locations has been undertaken based on laboratory testing results and investigation observations, and are shown on maps appended to the CSMP.

Requirements for further soil testing and monitoring, with regard to the reuse or disposal of soils are also included within the CSMP.

Management of contaminated groundwater that flows into the tunnels during its construction is covered by the GWMP.

3.4.8.2 Hazardous Substances

The Project will involve the use of a variety of construction plant and machinery. The majority of this plant will be motorised and will require a regular supply of fuels and oils. These can become a pollutant if discharged to ground or water. Other materials used in the construction process including drilling muds, concrete, bonding agents, sealants, flocculants and degreasers can result in environmental impacts if they are not managed carefully and are discharged to the environment in an uncontrolled manner.

A Hazardous Substances Management Plan (HSMP) is included in Appendix L outlining the requirements for proper storage, handling, transport and disposal of hazardous substances during the construction phase of the Project to minimise effects on health and safety from exposure and to reduce the impact on the environment.

3.4.8.3 Spill Response

The HSMP details the actions required following a spill within the spill response plan (HSMP - section 8). The basis of the spill response plan is that any spills will be contained within the site boundary, and there will be no discharge of contaminants to the wider receiving environment. It is important that workers are trained in the management of chemical spills and that the procedures are tested. To ensure there the response to any spills is effective, there needs to be provision of equipment required to manage a spill.

3.4.9 Archaeology

The archaeology mitigation methods as set out in this CEMP will remain consistent with the Culture and Heritage Objectives as set out in Section 2.5 of the NZTA's Environmental Plan:

H1	Proactively limit the disturbance of significant cultural and heritage features along state highways.
H2	For Historic Buildings we own, show a respect for them and maintain their integrity*

*Only indirect potential effect of settlement - managed through the SEMP.

The construction activities associated with the Project will impact on the locations of a number of recorded archaeological sites and have the potential to expose additional unrecorded subsurface archaeological remains. An Archaeological Site Management plan (ASMP) is included in Appendix M detailing how adverse effects on archaeological sites will be mitigated.

An important mitigation strategy includes recording archaeological information before it is affected. This will involve monitoring of works by an archaeologist and detailed recording of archaeological remains in some route sectors. In other sectors Accidental Discovery Protocols will be required so that appropriate procedures are followed if any previously unrecorded archaeological remains are exposed.

The ASMP outlines the archaeological mitigation requirements and procedures to be followed during archaeological monitoring of works in the Project area and recording of any archaeological remains, and if unrecorded archaeological remains are discovered when archaeologists are not present. It also outlines additional specific mitigation measures.

3.4.10 Visual Amenity

The visual quality mitigation methods as set out in this CEMP will remain consistent with the Visual Quality Objectives as set out in Section 2.10 of the NZTA's Environmental Plan:

VQ1	Incorporate multi-purpose landscaping as an integral part of all new state highway construction Projects.
VQ2	Improve the visual quality of the existing state highway network.

Construction of the Project is likely to impact on visual quality. Methods to minimise this include the following:

- Keep site tidy and clear of litter (Waste Management, section 3.4.11 below).
- Control pest plant species (ECOMP).
- Minimise the removal of vegetation as far as practical (ECOMP).
- Install temporary noise walls (CNVMP).
- Manage and minimise graffiti (section 3.4.10.2).
- Manage temporary construction lighting (section 3.4.10.3).

3.4.10.1 Landscaping and Urban Design

Urban Design and Landscape Plans will be implemented upon completion of construction activities and will contribute to visual amenity values post construction and beyond during the operation of the Project.

For the construction phase, where feasible, early plantings of vegetation that contribute to the long term urban design and landscape plans will take place. Along with retained vegetation, these early plantings will provide screening of construction sites and reduce impacts on the visual amenity of the community. The vegetation may also act as a buffer to aspects such as noise, dust and night-time works lighting which has the potential to cause nuisance to properties bordering construction sites.

Temporary noise walls and fencing will be painted an inconspicuous colour.

<u>Amenity Trees</u>

The removal of trees which contribute to the amenity of the area will be required to facilitate the construction of the Waterview Project.

Prior to any site works commencing, a pre-commencement site meeting will be held between the [Auckland Council] approved arborist "Project Arborist", the [Auckland Council] and the contractor so that conditions of

the designation that pertain to the retained amenity trees are explained by the Project Arborist to all contractors or sub-contractors who will be working on site within the dripline of, or adjacent to, any amenity trees that are covered by the designation. The Project Arborist will confirm the trees to be removed.

All Amenity Trees identified by the Project Arborist at risk of being potentially impacted by the construction works will have appropriate protection measures including temporary fencing put in place. A photographic record of each specified Amenity Tree should be undertaken prior to works commencing and at the completion of works.

The Project Arborist shall also undertake a tree monitoring programme throughout the construction phase, including monitoring of:

- The condition, repair and location of the temporary protective fencing;
- Any excavation within the dripline of amenity trees;
- General tree health; and
- Compliance with the conditions of designation by way of fortnightly inspections while working within the dripline of trees during the construction period.

If in the opinion of the Project Arborist the condition of the Amenity Trees has deteriorated and/or the works are likely to have an adverse effect on their condition then additional remedial measures should be implemented.

Replacement Trees

Where amenity trees require removal for construction of the project, it is proposed that replacement trees will be identified as part of the developed Urban and Landscape Design Framework. It may not be viable to plant replacement trees in their original location; however the framework takes into account the overall impacts on amenity of the area and seeks to mitigate these impacts, with replacement tree planting being one of the tools used.

3.4.10.2 Graffiti

Graffiti vandalism is the act of a person damaging or defacing any building, structure, road, tree, property, or other thing by writing, drawing, painting, spraying or etching on it, or otherwise. It significantly reduces the visual amenity of a street and community.

The Ministry of Justice has published a '*STOP Graffiti Guide*" containing a graffiti eradication tool kit and graffiti management toolbox that is to be consulted by the contractor. Graffiti management guidelines from this toolkit to be implemented include the following measures:

- Undertake an audit to assess the scale of the local graffiti vandalism problem.
- Work out what resources will be required to deal with the problem.

- If insufficient resources are available, work out ways in which further resources can be found.
- Clearly identify who is responsible for removing graffiti in which locations and, if possible, try and work collaboratively to ensure a removal standard is maintained.
- Agree a standard time frame for removal of graffiti (this may vary depending on whether or not the graffiti is in a high profile location).
- Remove the graffiti within the specified timeframe.

In the first instance, prevention of vandalism can be implemented through access denial, vegetation screening lighting, security graffiti protection coatings and subsequent removal (maintenance). However, the most effective strategy against graffiti vandalism is to remove it as quickly as possible and to persist in removing it. The community and site workers will be encouraged to report graffiti and weekly inspections will take place.

Removal of graffiti can be carried out by painting over, removing with chemicals, cleaning off (includes the use of sand and soda blasting) or replacement.

3.4.10.3 Construction Lighting Management

During construction, temporary lighting will be required in the main construction areas if any work is carried out during the hours of darkness. Spill lighting may cause a low to moderate nuisance to surrounding residents and glare from temporary light has the potential to cause a disabling effect to vehicles.

It is common practice during construction when upgrading sections of motorway (generally SH16) to use a method of mounting temporary light poles on re-locatable concrete blocks. Whilst not being accurately positioned or aimed, they do provide adequate light for traffic in reduced speed construction areas. This is considered a good method to reduce spill light and glare even for temporary lighting.

To manage the potential impacts of temporary lighting during construction, the contractor will use luminaires that do not produce environmental spill light above that required by the local council bylaws. Lighting plans will be produced by the contractor, or their designers for approval of any temporary lighting for construction works or construction facilities. These plans will be verified by an independently qualified lighting specialist. The plans are to show where lights are located and aimed, giving angle of azimuth and inclination before any site is operational. The luminaires for construction service areas will be of a full cut-off asymmetrical variety with no visor glass elevated more than 10 degrees above the horizontal. The fully cut-off variety of luminaire produces no light above the horizontal plane, the lamp being well tucked up into the reflector. These are considered very environmentally friendly and energy efficient, reducing spill lighting. With any selection the luminaires must conform to the photometric and material requirements of the AS/NZS 1680 Road lighting Standard.

Monitoring of lighting during construction will take place every 2 months by the contractor or following a complaint from an adjacent resident. Monitoring will include the following:

- Visual tests to check that luminaires have not been re-aimed inappropriately.

- Locations of lights in the construction service areas to see if they conform to the approved lighting plan (unless checked for compliance with the illumination engineer).

3.4.11 Resource Efficiency

The reduction and management of waste and the efficient use of energy as set out in this CEMP will remain consistent with the above Resource Efficiency Objectives 1 and 2 as set out in Section 2.9 of the NZTA's Environmental Plan and the NZTA's Waste and Energy Management Policy detailed below:

RE1	Manage energy consumption and waste associated with the NZTA's business in a cost effective and sustainable manner.
RE2	Make resource efficiency an integral part of all state highway activities.
Performance indicator	Annual reporting of the amount of recycled products used in new roading and/or reconstruction utilising cost-effective recycled pavement materials, including glass and aggregate. The trend is for increasing utilisation of recycled materials.

The NZTA Waste and Energy Management Policy Goals:

1. Transit will manage energy consumption and Waste in its business by

    a) Adopting Energy Conservation practices;

    b) Purchasing Energy Efficient products;

    c) Reducing its Energy Intensity by 15% within five years (from 1 July 2003) in respect of energy consumption in the office only, in accordance with the National Energy Efficiency and Conservation Strategy;

    d) Reducing the energy consumption of vehicles travelling on the state highway network as that relates to improvements in roading characteristics only (e.g. reducing road rolling resistance, improving grade and alignment), in accordance with the National Energy Efficiency and Conservation Strategy; and

    e) Reducing, Reusing, Recycling and Substituting Resources to lessen the amount of Waste requiring permanent disposal.

2. Transit will ensure all Waste requiring permanent disposal is managed in an environmentally responsible and cost-effective manner

3.4.11.1 Waste Management

Waste generated from the Project, if not appropriately managed has the effect to adversely impact on the following environmental aspects:

- Carbon reduction – eliminating, minimising, re-using, reducing and recycling waste reduces carbon emissions.
- Terrestrial ecology – litter encourages the prevalence of rodents.
- Aquatic ecology – contaminated discharge from incorrectly stored waste materials.
- Visual quality – litter on site reduces the amenity value and may spread onto surrounding properties.
- Air quality – certain waste materials have the potential to produce odours, which may be emitted beyond the Project boundaries, and uncovered dusty wastes may be blown across the site and beyond site boundaries.
- Human health – danger where cross contamination occurs through the mixing of waste during the disposal activity.

Mitigation

Environmental controls and methods to avoid or minimise potential impacts associated with waste generation, handling or disposal include:

- Educate construction teams; each team is responsible for cleaning up after themselves and reducing, recycling and disposing of waste responsibly according to the waste management systems on site,
- Minimise or eliminate the potential for construction material waste prior to activity – planning, design, layout, cutting patterns etc,
- Re-use solid wastes, or send for recycling – where applicable,
- Correct storage and separation of hazardous, non-hazardous and recyclable materials,
- Minimise potential for water or soil contamination by designating waste disposal points, located away from sensitive receptors and areas of water movement, preferably located with a concrete bunded area,
- Keep site tidy and clear of litter, especially in waste storage areas,
- Empty waste bins frequently to keep storage of waste to a minimum and avoid overloaded bins,
- Keep lids of bins closed, especially where bins are outside – in particular bins which contain food waste to prevent scavenging by birds and animals,
- Use appropriate waste disposal containers i.e. watertight plastic wheelie bins, plugged skips, and frequently check their condition,

Note: The management of wastes associated with excavated soils and hazardous substances are covered by the CSMP and HSMP respectively.

3.4.11.2 Energy Efficiency

By adopting an energy conservation strategy during the construction of the Project the following benefits will be gained;

- Energy efficiency equipment operation will result in the reduction of energy demand, and therefore costs, and
- Reduction of energy demand will result in the reduction of greenhouse gas emissions through direct means (i.e. less fuel consumed = less emissions), and indirect means (i.e. less electricity consumed = less coal burnt = less emissions).

Mitigation

To avoid and minimise potential impacts associated with energy generation and consumption, the following environmental controls and methods will be implemented:

- Purchase energy efficient products and services where applicable and financially viable.
- Construction methodologies will include selecting energy and time efficient methods, whilst addressing other concerns; utilising well-maintained new equipment, minimising down-time of equipment through preventative maintenance programs, reducing idling when not un use, and monitoring emissions for signs of inefficient operations (e.g. visible exhaust emissions).
- Energy saving measures are to be implemented in site and administrative offices, where applicable (e.g. timers or motion detectors on lights).
- During construction, an energy audit will be undertaken to establish the baseline energy usage for the works and identify measures to improve efficiency, and therefore reduce greenhouse gas emissions.
- Implement an energy management awareness programme as part of the Project induction, site induction and where applicable, ongoing site toolbox talks.

3.4.12 Specific Construction Operations

3.4.12.1 Traffic Management

Construction of the Project involves truck movements, lane and intersection closures and lowered speed limits on roads which have the potential to cause inconvenience to road users, and residents. A Construction Traffic Management Plan (CTMP) is included in Appendix N detailing traffic management methodologies and mitigation measures to be adopted for the Project.

The CTMP details the traffic control activities, the impacts on pedestrians, cyclists, residents, businesses, public transport, and general traffic and typical mitigation measures that will be considered in development of Site Specific Traffic Management Plans (SSTMP) and management of the Project.

Minimising traffic effects through implementing the CTMP will align with minimising carbon emissions. If construction works cause congestion and diversions on the road network, the efficiency of travel is reduced, causing an increase in fuel consumption (e.g. increased idling, stop/go traffic, increased diversion distances) and subsequently an increase in greenhouse gas emissions.

3.4.12.2 Concrete Batching Plant Management

The Project will necessitate the pouring of large quantities of concrete, especially for the tunnel linings. To facilitate this it is proposed to locate two temporary concrete batching plants in construction yards, one at each end of the tunnels. Runoff associated with the concrete batching plants has the potential to have elevated pH and may need to be pH adjusted. Discharges to air from batching will also require management. In addition the batching plants have the potential to generate noise causing nuisance effects to nearby residents. Management of these environmental aspects is detailed in the Concrete Batching and Crushing Management Plan (CBCPMP) attached in Appendix O. This sub-plan supports the industrial trade processes and air discharge consents associated with the plants.

3.4.12.3 Rock Crushing Plant Management

The construction of the tunnels and the portals involve excavation through a significant quantity of basalt. A primary rock crushing plant will be located in the vicinity of the southern portal to crush the rock to a size appropriate for reuse on other parts of the Project. The rock crushing plant will generate noise and dust which have the potential to disturb residents in the vicinity.

Management of these environmental aspects are detailed in the Concrete Batching and Crushing Plant Management Plan (CBCPMP) attached in Appendix O. This sub-plan supports the air discharge consents associated with the plant and district plan requirements for noise levels.

3.5 Emergency and Incident Response

There is the potential for unforeseen events to occur that may impact on the environment and will require emergency response. The following sections detail how environmental incidents or emergencies are to be managed by the contractor.

3.5.1 Incident Management

An environmental incident is an occurrence which has (or potentially could have had) a negative or 'adverse' effect on the environment. An adverse effect is something that causes (or could have caused) environmental harm. An environmental incident can also be a deviation from the NZTA's or the contractor's environmental management system or this CEMP. This means there has been a failure to follow the established process or procedures that help the Project achieve best practice (e.g. failure to report a spill).

Environmental incidents include but are not restricted to:

- Spills;
- Unforeseen impact on areas of high environmental value such as protected flora or fauna, archaeology;
- [Auckland Council] non-compliances (relating to erosion and sediment control);
- Other consent or designation non-compliances.

Table 3.1 below sets out, in the event of an environmental incident, the procedures to be followed.

Table 3.1 Management of environmental incidents

Environmental Incident Management Plan	
Performance Objective	To ensure rapid and appropriate response is made to on-site environmental incidents.
Statutory and Legislative Requirements	RMA and resource consent and designation conditions.
Performance Criteria	All incidents to be formally registered. All incidents responded to expeditiously and followed up by a thorough investigation by site responsible person. Minimise impact of the incident and restrict to an on-site activity. Eliminate potential for environmental complaints.
Response Person	Each site specific Project site will maintain an Environmental Manager and Site Manager role. The Environmental Manager or, in the Environmental Manager's absence, the Site Manger – is responsible for receiving, documenting, and thoroughly investigating all incidents. All members of on-site staff are responsible for their actions which may result in an

Environmental Incident Management Plan	
	environmental incident.
Implementation Strategy / Mitigation Measures	The details of all incidents – minor through to major, will be registered on an Environmental Incident / Emergency Form and supplied to the Environmental Manager by the employee involved in the incident. Upon receiving the incident form that Environmental Manager (or in the absence of the Environmental Manager the Site Manager) will commence an inquiry within 4 hours of the incident occurring. Steps to minimise, isolate or eliminate reoccurrence of the incident needs to be activate.
Monitoring	Targeted monitoring will be completed, dependent on the nature of the incident and requirements of applicable resource consents and designations.
Corrective Action	Following the investigation, a Non-Compliance Report (NCR) is to be issued to any party whose actions or omissions which gave rise to the incident which have been proved to be outside of the guidelines of this CEMP/ regulatory guidelines or permitted operational processes. In the event CEMP / regulatory guidelines or permitted operation processes were not breached, the Environmental Manager, Site Manager and the NZTA representative are to investigate how work practices may be modified to lesson perceived or actual environmental impact.
Reporting	• The Environmental Manager will report all incidents to the Site Manager. • The Environmental Manager will enter the details of the incident into the Environmental Incidents Register. • All Environmental Managers within the overall Waterview Project will meet on a monthly basis with an Environmental Representative from the NZTA, to report occurrences of incidents and the appropriate investigations. • The NZTA Environmental Representative will complete a Construction Compliance Report (including the means by which the incidents was addressed, and whether resolution was reached). This Report will be completed on a quarterly basis and communicated throughout the NZTA and the required statutory bodies. • Each Environmental Manager will summarise all incidents received throughout the sites to on-site staff members during weekly Tool Box sessions.
Identification of Failure to Comply with Procedure:	The following constitute examples of incidents or failure to comply in relation to the management of environmental incidents: • Insufficient information recorded on the Environmental Incident / Emergency Form; • Failure to submit the Environmental Incident / Emergency Form as soon as practical following the occurrence of the incident; • Incidents not documented or reported, and/or record not maintained;

Environmental Incident Management Plan	
	• Failure to implement corrective actions; • Failure to report incident to the NZTA, Environmental Managers and on site personnel • Reoccurrence of incident
Corrective Action:	Should an incident of failure to comply occur in relation to the management of environmental incidents, one or more of the following corrective actions will be undertaken as appropriate: • Conduct additional training of staff regarding incident management and processing; • Review procedure in light of shortfall.

3.5.1.1 Emergency Response

An environmental emergency is an event which has a detrimental effect on the surrounding environment. A detrimental environmental effect is something that causes significant harm to the environment, which is not legally allowed and requires immediate response. An environmental emergency can also be a deviation from the NZTA's or contractor environmental management system. This means there has been a failure to follow the established process or procedures that help the contractor achieve best practice.

Examples of environmental emergencies include but are not restricted to;

- Significant (large volume) chemical / oil spill into the Oakley Creek.
- Bentonite not contained – resulting in finer material dispersion into the Oakley Creek and marine environment.
- Excessive discharge of sediment to the CMA from piling activities.
- Hazardous substance release to air.

Table 3.2 below sets out, in the event of an environmental emergency, the process to be followed by the contractor. Environmental emergency contact details are included in Appendix R.

Table 3.2 Management of environmental emergencies

Environmental Emergency Response	
Performance Objective	To ensure rapid and appropriate response is made to on-site environmental emergencies, resulting in as minimal effect as possible.
Statutory and Legislative Requirements	• RMA, resource consent and designation conditions.
Performance	• All emergency events are responded to expeditiously and appropriate emergency

Environmental Emergency Response	
Criteria	services are contacted • Overall impact of the environmental emergency situation is minimised by efficient and effective response • Eliminate potential for environmental complaints and additional environmental incidents • All environmental emergencies are formally registered • Follow up investigation completed by site responsible person • Reduction of future potential emergencies – through minimisation, isolation or elimination responses.
Response Person	• Environmental Manager and Site Manager are responsible for receiving, documenting, and thoroughly investigating all emergency events • All on-site personnel are responsible for their actions which may result in an environmental emergency • All on-site personnel are responsible for being aware and trained in environmental emergency response.
Implementation Strategy / Mitigation Measure	• Upon the occurrence of an environmental emergency, appropriate emergency services (as per contact list provided below) will be notified and the area is secured to reduce further impact • The Environmental Manager and Site Manager are contacted immediately to attend the site of occurrence • The Environmental Manager is required to contact the NZTA Environmental Representative • The NZTA Environmental Representative to contact required regulatory bodies • Details of all emergency incidents will be registered on an Environmental Incident/Emergency Form and supplied to the Environmental Manager by n employee involved in the emergency – after the site has been cleared from emergency status. • Upon receiving the incident / emergency form the Environmental Manager and Site Manager will commence an inquiry, immediately • Steps to either – minimise, isolate or eliminate reoccurrence of the incident needs to be identified and implemented.
Monitoring	• Targeted monitoring will be completed, dependent on the nature of the incident and requirements of applicable resource consents and designations.
Reporting	• The Environmental Manager to provide an update to the NZTA Environmental Representative as soon as possible on the completion of the investigation • Details of the environmental emergency will be entered into the Environmental Incidents Register

Environmental Emergency Response	
	• The NZTA Environmental Representative will complete a Construction Compliance Report (including the means by which the emergency was addressed, and what safety controls have been implemented to reduce or eliminate the potential and scale of reoccurrence). This report will be completed on a quarterly basis and communicated throughout the NZTA and the required regulatory bodies ([Auckland Council], HPT and/or DoC). • Each Environmental Manager will summarise all environmental emergencies received throughout the sites to on-site personnel during weekly Tool-Box sessions.
Identification of Failure to Comply with Procedure	The following constitute examples of incidents or failure to comply in relation to the management of environmental emergencies; • Reoccurrence of an environmental emergency • Significant damage occurring from an environmental emergency • Insufficient information recorded on the Environmental Incident / Emergency Form • Failure to submit the Environmental Incident / Emergency Form as soon as practical following the emergency occurrence • Emergencies not documented or reported, and / or record not maintained • Failure to implement corrective actions

Corrective Action	• Following the investigation, a Non-Compliance Report (NCR) is to be issued to any party whose actions or omissions which gave rise to the environmental emergency which have been proved to be outside of the guidelines of this CEMP/ regulatory guidelines or permitted operational processes.
	• In the event CEMP / regulatory guidelines or permitted operation processes were not breached, the Environmental Manager, Site Manager and the NZTA representative are to investigate how work practices may be modified to lesson perceived or actual environmental impact.
	• Should an incident or failure to comply occur in relation to the management of environmental emergencies, one or more of the following corrective actions will be undertaken as appropriate;
	  • Conduct additional training of staff regarding environmental emergency management and processing
	  • Review procedure in light of shortfall.

3.5.1.2 Environmental Incidents / Emergency Form

One Environmental Incident / Emergency Form (EIEF) template will be used for all site specific activities throughout the construction of the Waterview Connection Project.

The form will include but not be limited to;

- Type of event – Incident or Emergency
- Date and time of event and/ or alleged event
- Weather conditions at the time of the event
- Operational processes on site during the time of the event
- Services contacted (i.e. emergency services)
- The result of the investigation or inquiry carried out in respect to the event, and the other relevant parties ([Auckland Council], the NZTA) which have been informed of the results of the inquiry and actions taken.

A copy of the Environmental Incident / Emergency Form is included in Appendix Q.

3.5.1.3 Environmental Incident / Emergency Register

A single Environmental Incident / Emergency Register (EIER) will be controlled by the Environmental Managers, with input and viewing ability by each Environmental Manager within the Project. It will contain all incidents and emergency events occurring on sites within the Project.

The Environmental Managers will input all data from completed EIEFs as soon as possible.

The EIER will be discussed at regular meetings held between the Environmental Managers and the NZTA Environmental Representative.

3.6 Communication and Interface

3.6.1 Internal Communications

Internal communication will be promoted within the internal activity sites through various means. Internal communication will take place predominantly during regular toolbox meetings. Environmental matters will be communicated to on-site personnel by the Environmental Manager or Site Manager at these meetings.

This communication will include but not be limited to;

- Environmental complaints, incidents and emergencies
- Corrective actions identified from environmental non compliances
- Information on environmental monitoring and inspections required and the results
- Change of operations procedures to eliminate potential environmental issues
- Changes to activities that may change risks to the environment
- Hazard management and identification of new environmental risks
- Revisions of the CEMP and relevant sub-plans

3.6.2 External communications

3.6.2.1 Public Engagement

All public engagement will take place in a consistent manner with the NZTA's *Public Engagement Policy and Guidelines (working draft) – February 2008*. The Public Engagement Policy and Guidelines document has been developed to assist in the informing and consulting people and stakeholders about decisions that the NZTA has made. By engaging the public, the NZTA can make better informed decisions, which will assist to improve Projects and deliver a responsive state highway network.

The community will be provided with opportunities to be involved in the project, for example through community planting days for reserve restoration and riparian rehabilitation. These opportunities will be developed and communicated to the community on an ongoing basis throughout the construction of the Project

Proactive communication and interface will be undertaken with sensitive receptors with the potential to be affected by the Project. Development of a consultation and communications plan with Waterview Primary School and Kindergarten will be required due to their close proximity to Construction Yard 5 which will be

operating throughout the Project. This plan will facilitate an accurate information transfer and adequate feedback process between the school and kindergarten, parents of students, and the NZTA.

3.6.2.2 Advertisement of Forthcoming Works

Prior to the commencement of construction, and at three weekly intervals, or as required depending on the scale of works and effects on the community, advertisements will be placed in the relevant local newspapers detailing the nature of the forthcoming works, the location of the forthcoming works and hours of operation. All advertisements will include reference to a 24 hour toll free complaints telephone number. Where relevant, advertisements will also include but not be limited to details of;

- Any traffic disruptions or controls or changes to property access; and
- Any irregular work practices
- Communications with the Media

All enquiries from the media – print, television etc, will be channelled through either the contractor Site Manager or contractor Project Director.

Upon receiving any enquires, the contractor personnel will immediately notify the Site Manager (or in the Site Manager absence the Project Manager), who will notify the NZTA. The NZTA will manage all communication with respective media.

3.6.2.3 Communications with Authorities and the NZTA

Correspondence with the [Auckland Council], HPT, DoC and the NZTA will be required throughout the construction of the Project. Reporting to these parties is summarised in section 4.2 and detailed further in the following sections:

- Incidents and emergencies - section 3.5
- Complaints - section 3.6.3
- Monitoring - section 4.1
- Reporting - section 4.2
- Auditing – section 4.3
- Corrective action –section 4.4
- Reporting – section 4.4.2
- Review of this CEMP - section 4.5

3.6.3 Complaints Management

As part of the NZTA's Environmental Plan all complaints will be managed, investigated and resolved (as appropriate) in accordance with the NZTA's *Guideline for Handling Environmental Complaints*.

Prior to commencement of construction, a 24 hour toll free telephone number and email address for complaints will be instituted and published by the NZTA (or Site Specific Contractor). A sign containing these details will be located at each site specific activity.

Details regarding all environmental complaints and remedial actions taken will be recorded using an appropriate complaints procedure form and catalogued in the complaints register. The general complaint process detailed in Table 3.3 below will be followed.

Table 3.3 Management of environmental complaints

Environmental Complaints Management Plan	
Performance Objective:	To ensure that a rapid and appropriate response is made to the public and internal complaints.
Statutory and Legislative Requirements:	• The NZTA Guideline for Handling Environmental Complaints • Resource consent and designation conditions
Performance Criteria:	• All complaints to be formally registered • All complaints responded to expeditiously and followed up by a thorough investigation by the site responsible person.
Responsible Person:	• Each site specific Project site will maintain an Environmental Manager and Site Manager role. • The Environmental Manager – or in the Environmental Manager's absence the Site Manager – is responsible for receiving, documenting, and thoroughly investigations all complaints. • All members of staff on site are responsible for their actions which may result in environmental complaints.
Implementation Strategy / Mitigation Measures:	• The details of all complaints received (by phone, email, in writing or in person) will be registered on the Environmental Complaint Form. • Upon receiving a complaint the Environmental Manager (or in the absence of the Environmental Manager the Site Manager) will commence an inquiry within 24 hours of receiving the complaints. An interim response advising that investigations are continuing is acceptable. A formal written response to the complainant within 10 days of complaint receipt will be provided to the complainant and appropriate regulatory authorities ([Auckland Council], HPT and/or DoC). • Mediation procedures will be instigated where the complaint is unable to be resolved. • The Environmental Manager will ensure that the details of the investigations and any

Environmental Complaints Management Plan	
	follow up actions are completed and recorded within the Environmental Complaints Form in respect to each complaint. • All details included on the Environmental Complaint Form will be inputted into the Environmental Complaints Register. • In the absence of the both the Environmental Manager and the Site Manager, the person registering the compliant is to take and document full details of the complaint in accordance with the Environmental Complaint Form and notify the Environmental Manager or Site Manager immediately.
Monitoring:	• Targeted monitoring will be completed dependent on the nature of the complaint. • Mechanisms will be established prior to and during construction to provide base lines in relation to noise, dust, water quality and quantity (surface and groundwater), ecological parameters, sediment contamination of the inlet, coastal processes, archaeology surveys through arrangements with local Environmental Consultants conducting relevant monitoring and/or sampling.
Reporting	• The Environmental Manager will report all complaints to the Site Manager. • The NZTA representative will complete a Construction Compliance Report (including the means by which the complaint was addressed, whether resolution was reached and how the response was carried out in relation to the NZTA Guideline for Handling Complaints). This Report will be completed on a quarterly basis and communicated throughout the NZTA and the required statutory bodies. • The Environmental Manager will summarise all complaints received throughout the sites to on-site staff members during weekly Tool Box sessions.
Identification of Failure to Comply with Procedure:	The following constitute examples of incidents or failure to comply in relation to the management of environmental complaints: • Insufficient information recorded on the Environmental Complaints Form; • Failure to submit the Environmental Complaints Form as soon as practical following the receipt of the complaint; • Complaints not documented or reported, and/or record not maintained; • Failure to implement corrective actions; • Failure to report complaint to the NZTA, the Environmental Manager and site personnel.
Corrective Action:	• Following the investigation, a Non-Compliance Report (NCR) is to be issued to any party whose actions or omissions which gave rise to the complaint which have been proved to be outside of the guidelines of this CEMP/ regulatory guidelines or permitted operational processes. • In the event CEMP / regulatory guidelines or permitted operation processes were not breached, the Environmental Manager, Site Manager and the NZTA representative are to investigate how work practices may be modified to lesson perceived or actual

Environmental Complaints Management Plan	
	environmental impact. • Should an incident of failure to comply occur in relation to the management of environmental complaints one or more of the following corrective actions will be undertaken as appropriate: o Conduct additional training of staff regarding complaint management and processing; o Review procedure in light of shortfall.

3.6.3.1 Environmental Complaint Form

One Environmental Complaint Form (ECF) template will be used for all site specific activities throughout the Project.

The form will contain but not be limited to;

- Name and address of complainant
- Identification of the nature of the complaint
- Date and time of the complaint and alleged event
- Weather conditions at the time of the complaint
- Operational processes on site during the time of the complaint
- The result of any investigation or inquiry carried out in respect to the complaint and other relevant parties [Auckland Council], HPT and/or DoC have been informed of the results of the complaints inquiry and actions taken.

A copy of the Environmental Complaint Form is included in Appendix Q.

3.6.3.2 Environmental Complaints Register

A single Environmental Complaints Register (ECR) will be controlled by the NZTA Environmental Representative, with input and viewing ability by each of the Environmental Managers within the overall Project. It will contain all complaints received for the Project.

The Environmental Managers will input all data from completed ECFs as soon as possible.

The ECR will be discussed at regular meetings held between the Environmental Managers and the NZTA Environmental Representative.

3.6.3.3 Construction Compliance Report

The NZTA Environmental Representative will complete a Construction Compliance Report (CCR) on a quarterly basis, summarising the complaints received and follow up actions. The CCR will be provided to the [Auckland Council] on a quarterly basis.

3.7 Transition Phase

The transition phase is the crossover period between the construction and operational phases of the Project whereby the responsibility for the management of the environment is transferred from the construction contractor to the network operator. During this phase the construction contractor(s) will be required to work with the NZTA in finalising the construction and meeting any post-construction resource consent and designation conditions before the Project is presented to the Operation and Maintenance Contractor (OMC). The transition phase also provides for the transfer of information in relation to consent and designation conditions which remain operative (such as long term monitoring), and historical results of environmental management and monitoring that are pertinent to effective ongoing management of the environment.

Consents and designation conditions still operative are to be entered into the OMC's CS-VUE Project file and managed by the OMC. Environmental Information transferred to the OMC includes:

- Landscape design and as-builts
- Agreements between other key stakeholders (e.g., DoC, landowners)
- Environmentally sensitive areas
- Location of contaminated land and/or fill
- Monitoring requirements
- Historical monitoring results
- Results of audits and inspections in relation to environmental risks that were identified as significant in the risk assessment process
- A report on consent and designation conditions that have been closed out on CS-VUE.

This information is to be collated by the contractor's environmental team following the completion of works. In addition this information will be included in the assets owner manual and operations and maintenance manual prepared by the contractor and handed to the OMC of the Project.

4. Monitor and Review

4.1 Compliance Monitoring

The following describes procedures for monitoring activities to evaluate compliance with legal requirements, the NZTA objectives and relevant policies, standards and guidelines.

4.1.1 Environmental Risk Register

The Environmental Risk Register, to be populated and maintained by the contractor, is a tool for identifying, prioritising and management of activities that have the potential to impact on the environment. As described in section 2.2, the risk assessment process adopted defines a process of managing significant risks with comprehensive environmental management plans (the sub-plans). The Risk Register will be regularly updated and reassessed to allow all significant aspects to be identified. The Risk Register will allow the contractor to search and sort on activities, locations, environmental aspects, and risk ratings, and provide a quick reference to the mitigation measures and controls that are in place to manage the significant impacts.

4.1.2 Environmental Monitoring

Scheduled environmental monitoring of environmental performance and compliance with resource consents and designations is required throughout the construction phase of the Project. This enables the overall effectiveness of the environmental controls to be determined and allows areas of non compliance to be identified so corrective actions can be taken.

Environmental monitoring will take place pre construction to assess the baseline, during construction to assess the impact of the construction on the environment, and after construction to assess the impact of the completed Project. Environmental monitoring is required at various stages of construction for each environmental aspect as developed in specific environmental sub-plans and this CEMP. The overall monitoring schedule, including environmental aspects (i.e. noise, water quality, air quality etc), frequency and monitoring requirements is included in Appendix P.

As such, the monitoring schedule will be a working document and will be amended and updated to reflect resource consent and designation conditions and management review changes. Environmental monitoring will be undertaken according to the following;

- Environmental Manager(s) are responsible for managing the environmental monitoring programmes relevant to their site activities and location, and arranging training and specialist consultants for the monitoring as required.

- Monitoring will be conducted in accordance with the approved methods stated in the resource consent and designation conditions, or as otherwise agreed by the [Auckland Council], DoC or HPT.

- Monitoring results exceeding relevant standards and resource consent and designation conditions will be managed as per the Corrective Actions process and issued with a Non Compliance Report (NCR).

- The NZTA Environmental Representative will be advised by the Environmental Managers of any non – compliance from monitoring and will report these to the [Auckland Council], DoC and/or HPT as required.

- All environmental monitoring results will be input by the appropriate Environmental Managers to a CS-VUE database. This will be overviewed on a regular basis by the NZTA Environmental Representative.

- Environmental Monitoring results will be reported to the [Auckland Council], DoC and/or HPT as required.

The specifics of monitoring for each environmental element are detailed in the individual sub-plans, included in the appendices of this CEMP.

4.1.2.1 General Site Monitoring

In addition to formal environmental monitoring, the following general site monitoring will be undertaken;

- Daily – Environmental Managers will conduct inspections (including all subcontractor activities), and issues will be noted. These inspections are informal visual inspections in order to check compliance with this CEMP.

- Weekly – Formal site inspections are to be completed by the Environmental Managers. Site specific checklists will be developed to check compliance with resource consent and designation conditions and this CEMP. Issues will be noted if they present significant environmental risks (e.g. noisy works, works near waterways, sediment basin maintenance etc). A review of current Environmental Risk Register (aspects and effects) will be carried out, updating the register as required.

- Monthly – The NZTA Environmental Representative, and appropriate Site Manager will undertake a monthly site visit with each Environmental Manager, to confirm the environmental monitoring programmes and work procedures containing environmental controls are bring implemented in accordance with the site specific CEMP, sub-plans, Operational Work Programme and resource consent and designation conditions.

At the end of each month, the Environmental Manager will submit a site inspection and environmental performance report to the NZTA Environmental Representative. The report will include but not be limited to; a summary of environmental issues and actions during the month to ensure compliance with this CEMP including any details of any action item requests, complaints received, incidents, associated investigations and corrective actions, and environmental inductions and awareness training provided.

4.1.2.2 Review

The Environmental Manager and Site Manager will review the daily inspection forms on a weekly basis to confirm that the checks and subsequent required works are being carried out, and additional inspections are included as per construction progress.

A regular meeting will be held on site between the Project Manager, Site Manager, the NZTA Environmental representative, and the Environmental Manager to discuss the results of the weekly and monthly site monitoring.

On a monthly basis the Environmental Manager will review the monitoring schedule and compliance results from the required Environmental Monitoring as per the resource consent and designation conditions.

4.1.2.3 Environmental Compliance

Should inspections indicate that the environmental controls are not functioning as intended, the Environmental Manager and Site Manager or Engineer will instigate a review of the CEMP or relevant sub-plans. All required approvals and mitigation works are to be completed within a three working day period from the notification of the non-compliance and be passed by the NZTA Environmental Representative.

4.2 Reporting

Table 4.1 below outlines the reporting requirements as detailed within the CEMP.

Table 4.1 Reporting requirements

Report	Reporting Requirements	Timing	Responsibility	Recipient
Resource Consent and Designation Compliance Reports	As per resource consent and designation conditions	As per resource consent and designation conditions	The NZTA Environmental Representative	[Auckland Council]
Environmental Complaint Form	Obtain complaint details as describe in Section 3.6.3	At the time of the complaint	Environmental Manager	Environmental Complaints Register
Environmental Complaints Register	Information provide on Environmental Complaint Form	At complaint closure	Environmental Manager	The NZTA Environmental Representative
Non-Compliance Report	Identification of non-complying activity which has resulted in an environmental complaint or incident on site.	During complaint investigation	Environmental Manager	Contractor
Construction Compliance Report	Summary of complaints received and resolutions	Quarterly	The NZTA Environmental Representative	The NZTA and [Auckland Council]
General Site Monitoring Report	Summary of site inspections, including daily, weekly and monthly inspections – consent and designation and CEMP compliance	Monthly	Environmental Manager	The NZTA Environmental Representative
Environmental Formal Site Inspection	Weekly site inspection sheets	Weekly	Environmental Manager	The NZTA Environmental Representative
Environmental Incident Reports	Obtain the incident details as described in section 3.5.1.2	At the time of the incident	On site personnel involved in the incident	Environmental Manager

Report	Reporting Requirements	Timing	Responsibility	Recipient
Environmental Emergency Response Reports	Obtain Environmental Emergency information as per section 3.5.1.2	At the completion of the Environmental Emergency situation	Environmental Manager and on site personnel involved in the environmental emergency	Site Specific Manager and The NZTA Environmental Representative, and [Auckland Council] – where appropriate and required under legislation
Environmental Audits	Summary of quarterly environmental audit findings	Quarterly, within two weeks of audit completion	Environmental Manager	The NZTA Environmental Representative and Site Manager
Site Audits	Summary of informal audit findings	Monthly, within two weeks of audit completion	Environmental Manager	Site Manager and on site personnel.

4.3 Environmental Auditing

On-site Environmental Auditing is required to;

- Determine whether the environmental management system conforms to planned arrangements and is properly implemented and maintained; and
- To provide information of environmental compliance to the NZTA

On-site audits will include;

- Formal site wide environmental audits, completed on a quarterly basis, and
- Informal site environmental audits, completed on a monthly basis.

Formal environmental audits will be conducted by the Environmental Manager and reported to the NZTA on a quarterly basis. Results from the audits will be recorded on an Environmental Auditing template used for all site specific activities throughout the Project. An example of the Environmental Auditing template is included in Appendix Q.

Findings of from the audits will be presented to the Site Managers and the NZTA Environmental Representative within two weeks of conducting the audit.

Site environmental audits are to be completed on a smaller scale, focussing an environmental matter within a single operational procedure or a group of related operational procedures (e.g. spill response within the concrete batching plant).

Informal audits are to be completed on a monthly basis, by the Environmental Manager. Results from the site environmental audits will be reported on the Environmental Audit template, included in quarterly formal environmental audit results and communicated to on site staff members during a toolbox session, within two weeks of the audit taking place.

4.4 Corrective Action

Corrective action is required on the basis of the occurrence of substandard performance being observed or experience, resulting in an actual or potential environmental complaint, incident or emergency.

Substandard performance will be measured by resulting actions i.e. complaints, incidents and emergencies, and compliance with the CEMP, resource consents, designations and operational procedures. Where failure to comply with these requirements occurs the responsible on-site personnel will be issued with a Non-Compliance Report (NCR).

The NCR is to contain the corrective actions required to be completed by the on-site personnel to either - minimise, isolate or eliminate the potential future environmental effects and non-compliance with the site requirements. A NCR can also be used in a proactive situation by on-site personnel where current operational procedures or the CEMP do not cover newly identified significant environmental aspects. Each on-site personnel are responsible for the identification and reporting of non-compliances, and the usage of NCRs.

Predominantly NCRs will be issued after investigations and inquiries as follow up for environmental complaints, incidents and emergencies.

4.4.1.1 Non – Compliance Report

One Non – Compliance Report (NCR) template will be used for all site specific activities throughout the Project.

An example of the Non - Compliance Report is included in Appendix R.

4.4.2 Environmental Reporting

Overall Project environmental performance will be reviewed. The following applies:

- The Environmental Manager is responsible for ensuring all relevant documentation is submitted and maintained within the Project filing and document control system.
- Applicable documentation will include but not be limited to:
    - all accidents and incidents reports and investigation outcomes;
    - weekly and fortnightly environmental checklists and reports files by contractors;
    - formal and informal audit and environmental monitoring reports including NCR reports, and any laboratory analysis submitted by external consulting groups;
    - records of environmental training;
    - the NZTA's laboratory analysis reports and instrument calibration records;
    - chain of custody records; and
    - minutes of meetings.

These reports will constitute records for the contractors EMS and resource consent and designation compliance purposes.

- The Environmental Manager will report weekly to the Site Manager on the status of site environmental matters this report also being an agenda item at the weekly project safety review group meeting.

- In addition to their weekly checklists, contractors will report monthly to the Environmental Manager about environmental issues and the overall status of the CEMP and regulatory compliance.

- The NZTA's Project Manager is required to report quarterly to the NZTA Chief Executive on the status of site environmental matters.

- Further, should any employee of the NZTA or the contractor become aware of an environmental incident or hazard that is causing - or has the potential to cause environmental harm - the person must advise their immediate supervisor who will notify the Environmental Manager, and an incident report complying with the Project incident reporting guidelines completed.

- If, under any Act or Regulation, conditions of a consent, designation, permit, approval, or license, a report is required to be made to a regulatory authority such as the [Auckland Council], DoC or HPT. The report will be made by the relevant holder of the authority following consultation with the environmental manager. A copy of any such report will be provided to the NZTA's Environmental Representative for review and approval of the content prior to the submission of the report to the regulatory authority.

4.5 CEMP Management Review

This document will be reviewed after confirmation of the resource consent and designation conditions and will be revised in accordance with those conditions. The CEMP and the sub-plans will be updated, with the necessary approval, throughout the course of the Project to reflect material changes associated with changes to construction techniques or the natural environment.

Approval from the [Auckland Council], Historic Places Trust and/or the Department of Conservation will be required for any relevant revisions of a material nature to the CEMP or sub-plans, for which these authorities have jurisdiction.

A management review of the CEMP will be undertaken at least annually by the Project Management team and the NZTA Environmental Representative. The management review will be organised by the Environmental Manager. The review will take into consideration:

- Input from the NZTA and contractor personnel;
- Site personnel comments;
- Audit findings and recommendations;
- Environmental monitoring records;
- Environmental complaints, incidents and emergencies;
- Details of corrective and preventative actions;
- Environmental non compliances;
- Changes to organisational structure;
- Ongoing compliance with objectives, conditions and targets; and
- Possible changes in legislation and standards.

The review process will include looking at the environmental controls and procedures to make sure they are still applicable to the activities being carried out. Reasons for making changes to the CEMP will be documented. A copy of the original CEMP document and subsequent versions will be kept for the Project records, and marked as obsolete. Each new/updated version of the CEMP documentation will be issued with a version number and date to eliminate obsolete CEMP documentation being used

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Appendix A: Environmental Risk Register Template & Example

Appendix B: Environmental Risk Rating Tables

Appendix C: Environmental Maps / Plans

Appendix D: Construction Noise and Vibration Management Plan (CNVMP)

Appendix E: Construction Air Quality Management Plan (CAQMP)

Appendix F: Erosion and Sediment Control Plan (ESCP)

Appendix G: Temporary Stormwater Management Plan (TSMP)

Appendix H: Ecological Management Plan (ECOMP)

Appendix I: Groundwater Management Plan (GWMP)

Appendix J: Settlement Effects Management Plan (SEMP)

Appendix K: Contaminated Soils Management Plan (CSMP)

Appendix L: Hazardous Substances Management Plan (HSMP)

Appendix M: Archaeological Site Management Plan (ASMP)

Appendix N: Construction Traffic Management Plan (CTMP)

Appendix O: Concrete Batching and Crushing Plant Management Plan (CBCPMP)

Appendix P: Summary of Monitoring Requirements

Appendix Q: Project and Environmental Emergency Contacts

Appendix R: Environmental Incident / Emergency, Complaint and Audit Form, and Non – Compliance Report