

Christchurch Southern Motorway Stage 2 and Main South Road Four Laning

Draft Construction Environmental Management Plan November 2012



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The draft Construction Environmental Management Plan (CEMP) has been produced in support of the Assessment of Environmental Effects (AEE) for the Main South Road Four Laning & Christchurch Southern Motorway Stage 2 Project. It is contained within volume 4 of the lodgement document, along with the Specialised Environmental Management Plans (SEMP) which are appendices to the CEMP.

This document has been prepared to meet the NZTA minimum requirements for a Contractors Social and Environmental Management Plan as per SM030 minimum standard z/4.

The technical reports produced in support of the AEE form Volume 3 of the lodgement document. Cross-references to the relevant reports and the CEMP itself are provided in the AEE where appropriate. A full list of technical reports is shown in the table below, with links to the relevant sections of the AEE and to any applicable SEM. For a full understanding of the Project all technical reports need to be read in full along with the AEE itself.

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Schedule of Technical Reports for the AEE

No.	Technical Report Title	Primary AEE Chapter Reference	SEMPs
1	Design philosophy statement	4	
2	Traffic and transportation effects report	11	Construction Traffic Management Plan
3	Assessment of stormwater disposal and water quality	19	Erosion and Sediment Control Plan, Accidental Aquifer Interception Management Plan
4	Landscape and visual effects	15	Landscape Management Plan
5	Assessment of effects – urban design	14	Landscape Management Plan
6	Urban and landscape design framework	14, 15	Landscape Management Plan
7	Landscape context report	15	Landscape Management Plan
8	Assessment of operational noise effects	17	
9	Assessment of construction noise & vibration	17	Construction Noise and Vibration Management Plan
10	Assessment of air quality effects	18	Air Quality Management Plan
11	Geotechnical engineering and geo-hazards assessment	3, 21	
12	Assessment of archaeological effects	24	
13	Social impact assessment	26	
14	Economic impact assessment	25	
15	Cultural impact assessment	23	
16	Contaminated land assessment	22	
17	Aquatic ecology assessment	20	
18	Terrestrial ecology assessment	20	
19	Lighting assessment	16	
20	Statutory provisions report	6, 28	
-	Construction Environmental Management Plan	5	

For further information on the structure of the lodgement documentation, refer to the 'Guide to the lodgement documentation' document issued with the AEE.

Contents

1.	Part A – Background	4
1.1	Scope and Application.....	4
1.2	The Project	6
1.3	Construction Activities	9
1.4	CEMP Policy and Objectives	14
2.	Part B – Social and Environmental Management	17
2.1	Environmental Management	17
2.2	Existing Environment	18
2.3	Project Construction Environmental Issues	23
2.4	Legislative and other requirements	37
2.5	Environmental Risk Register.....	39
3.	Part C – Implementation and Operation.....	41
3.1	CEMP Management Structure and Responsibility.....	41
3.2	Training.....	42
3.3	Operating Procedures	44
3.4	Emergency Contacts and Response	44
4.	Part D – Monitoring and Review	48
4.1	Compliance Monitoring.....	48
4.2	Reporting	51
4.3	Documents and Records	53
4.4	CEMP audits.....	54
4.5	Corrective Action	55
4.6	Feedback Management	58
4.7	CEMP Management Review	59

Tables

Table 1 Summary of relevant NZTA environmental objectives provided in the NZTA Environmental Plan 2008	15
Table 2 Existing environment	19
Table 3 Management roles and responsibilities	41
Table 4 Environmental Emergency Contacts	45
Table 5 Equipment Calibration and Maintenance	50
Table 6 CEMP Reporting requirements	51
Table 7 Environmental Audits Schedule.....	55

Figures

Figure 1 Location Map of MSRFL and CSM2 Project	8
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Appendices

- A. SEMP 001 Air Quality Management Plan
- B. SEMP 002 Erosion and Sediment Control Plan
- C. SEMP 003 Construction Noise and Vibration Management Plan
- D. SEMP 004 Construction Traffic Management Plan
- E. SEMP 005 Landscape Management Plan
- F. SEMP 006 Accidental Aquifer Interception Management Plan
- G. CEMP Risk Assessment & Risk Register
- H. CEMP Construction Programme
- I. Accidental Discovery Protocol
- J. CEMP Environmental Feedback Form
- K. CEMP Environmental Non Conformance Form
- L. CEMP Environmental Corrective Actions Log
- M. CEMP Environmental Training Form (ETF) Template

List of Abbreviations

Term	
AEE	Assessment of Environmental Effects
CAQMP	Construction Air Quality Management Plan
CCC	Christchurch City Council
CEM	Construction Environmental Manager
CEMP	Construction Environmental Management Plan
CNVMP	Construction Noise and Vibration Management Plan
CSM1	Christchurch Southern Motorway Stage 1
CSM2	Christchurch Southern Motorway Stage 2.
EIR	Environmental Incident Register
ECAN	Environment Canterbury
EMS	Environmental Management System
ENCR	Environmental Non Conformance Report
ESCP	Erosion and Sediment Control Plan
FR	Feedback Register
GCS	General Control Statement
HJR	Halswell Junction Road
MSRFL	Main South Road Four Laning
NCR	Non Conformance Report
QMS	Quality Management System
SDC	Selwyn District Council
SEMP	Specialised Environmental Management Plan
SOP	Standard Operating Procedures
SSTMP	Site Specific Traffic Management Plans

1. Part A – Background

This draft Construction Environmental Management Plan (CEMP) details principles, practices and procedures to be implemented by the Christchurch Southern Motorway Stage 2 (CSM2) and Main South Road Four Laning (MSRFL). These principles, practices and procedures are intended to meet the conditions of resource consents and designations, other relevant legislation and the environmental objectives of the NZ Transport Agency (NZTA).

This CEMP has been prepared prior to the appointment of a Principal contractor. The Principal contractor will be required to produce its own Contractors Environmental Management Plan in accordance with the conditions of consent and NZTAs requirements that will build upon and provide more detail to this CEMP.

It should be noted that the requirements of this CEMP do not remove or overwrite the legal duties, responsibilities and obligations of the Principal Contractor and other parties in accordance with contract documents and legislation. If at any time the CEMP conflicts with the contractual and legal obligations for the project in general the Contractor will inform the Engineer to the contract at the earliest opportunity, highlighting the action or area of conflict. Legal obligations shall take precedence in any such instance. Contractual obligations should take precedence over CEMP requirements until such time as the conflict is resolved.

1.1 Scope and Application

This CEMP is the umbrella document for environmental management of the construction phase of the CSM2 and MSRFL Project (the "Project"). It is supported by a range of Specialised Environmental Management Plans (SEMPs) which are attached as appendices to this CEMP.

This CEMP will be reviewed after confirmation of the resource consent and designation conditions, and the document revised in accordance with these conditions. The CEMP and the SEMPs that are included within the Appendices of this CEMP should be updated, with the necessary certification, throughout the course of the Project to reflect material changes associated with changes to construction techniques or the physical environment.

While all sections should be reviewed prior to implementation, sections to be completed or significantly updated prior to works commencement by the Principal contractor, are clearly labelled throughout this Draft CEMP. Where appropriate a section labelled "*CEMP Expectations for the appointed Principal Contractor*" will set out requirements.

1.1.1 Purpose of the CEMP

The purpose of the CEMP is to:

- Specify practicable methods and measures to avoid and mitigate adverse environmental effects arising from construction work.
- Achieve compliance with environmental legislation;
- Meet the expectations of NZTA national policy for environmental protection;

- Adhere to project environmental objectives;
- Provide the Principal Contractor with sufficient information to enable the development of a Contractor's Environmental Management Plan, or provide a CEMP for direct adoption and refinement by the appointed Principal Contractor;
- Identify and manage environmental risks associated with the Project; and
- Provide the framework for the Contractor responsible for this CEMP to achieve compliance with the conditions of resource consents and designations.

The CEMP defines details of who, what, where, when and how environmental management and mitigation measures should be implemented.

This CEMP and the SEMP's will require review and amendment during the construction phase 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 its effectiveness. Modification will be required once the consents and designations are obtained and detailed design and construction methods finalised.

In preparing this CEMP, the following considerations have been factored into the development process for mitigation measures:

- The identified significant environmental issues within the main Assessment of Environmental Effects Report (AEE)¹;
- The extent and duration of the activities (e.g. multiple year construction project);
- The location, and in particular the vicinity to sensitive receiving environments; and
- The principle that environmental management needs to be incorporated into day-to-day operations.

This CEMP has also been structured in accordance with NZTA guidance document² and with best practice following a "plan –do –check –review" cycle as established within ASNZS ISO14001:2004³. The ISO14001 standard sets out an internationally recognised and adopted framework for an environmental management system that is at the heart of this CEMP.

The CEMP has been divided into four main sections plus Appendices, as follows:

1. **Part A Background** – provides an outline of the CEMP development process and the scope and application of the CEMP, a Project description, a description of the anticipated construction activities and the relevant NZTA Environmental Policy. It also outlines the applicable NZTA environmental objectives and key performance indicators;
2. **Part B Social and Environmental Management** – identifies the significant environmental aspects of the project and identifies the applicable legal requirements.

¹ Christchurch Southern Motorway Stage 2 and Main South Road Four Laning Assessment of Effects GHD Ltd 2012

² Draft guideline for the preparation and implementation of Contractor's Social and Environmental Management Plans, NZTA, August 2011 and NZTA Minimum Standard Z/4 – Contractor's Social and Environmental Management Plan.

³ Environmental management systems — Requirements with guidance for use.

3. *Part C Implementation and operation* – describes the management structure, contractor training expectations, relevant operating procedures and emergency contacts and response plans;
4. *Part D Monitoring and review* – outlines the procedure for compliance monitoring, audit processes, procedures for corrective action and management reviews.
5. *Appendices* – including specific Management Plans for the Project.

1.2 The Project

Before considering environmental issues and construction environmental management it is necessary to outline the main features of the Project.

The NZ Transport Agency (NZTA) seeks to improve access for people and freight to and from the south of Christchurch via State highway 1 (SH1) to the Christchurch City centre and Lyttelton Port by constructing, operating and maintaining the Christchurch Southern Corridor. The Government has identified the Christchurch motorway projects, including the Christchurch Southern Corridor, as a road of national significance (RoNS).

The proposal forms part of the Christchurch Southern Corridor and is made up of two sections: Main South Road Four Laning (MSRFL) involves the widening and upgrading of Main South Road (MSR), also referred to as SH1, to provide for a four-lane median separated expressway; and the construction of the Christchurch Southern Motorway Stage 2 (CSM2) as a four-lane median separated motorway. The proposed construction, operation and maintenance of MSRFL and CSM2, together with ancillary local road improvements, are referred to hereafter as 'the Project'.

1.2.1 MSRFL

Main South Road will be increased in width to four lanes from its intersection with Park Lane north of Rolleston, for approximately 4.5 km to the connection with CSM2 at Robinsons Road. MSRFL will be an expressway consisting of two lanes in each direction, a median with barrier separating oncoming traffic, and sealed shoulders. An interchange at Weedons Road will provide full access on and off the expressway. MSRFL will connect with CSM2 via an interchange near Robinsons Road, and SH1 will continue on its current alignment towards Templeton.

Rear access for properties fronting the western side of MSRFL will be provided via a new road running parallel to the immediate east of the Main Trunk rail corridor from Weedons Ross Road to just north of Curraghs Road. For properties fronting the eastern side of MSRFL, rear access is to be provided via an extension of Berketts Drive and private rights of way.

The full length of MSRFL is located within the Selwyn District.

1.2.2 CSM2

CSM2 will extend from its link with SH1 / MSRFL at Robinsons Road for approximately 8.4 km to link with Christchurch Southern Motorway Stage 1 (CSM1, currently under construction) at Halswell

Junction Road. The road will be constructed to a motorway standard comprising four lanes, with two lanes in each direction, with a median and barrier to separate oncoming traffic and provide for safety.⁴ Access to CSM2 will be limited to an interchange at Shands Road, and a half-interchange with eastward facing ramps at Halswell Junction Road. At four places along the motorway, underpasses (local road over the motorway) will be used to enable connectivity for local roads, and at Robinsons / Curraghs Roads, an overpass (local road under the motorway) will be provided. CSM2 will largely be constructed at grade, with a number of underpasses where elevated structures provide for intersecting roads to pass above the proposed alignment.

1.2.3 Key Design Features

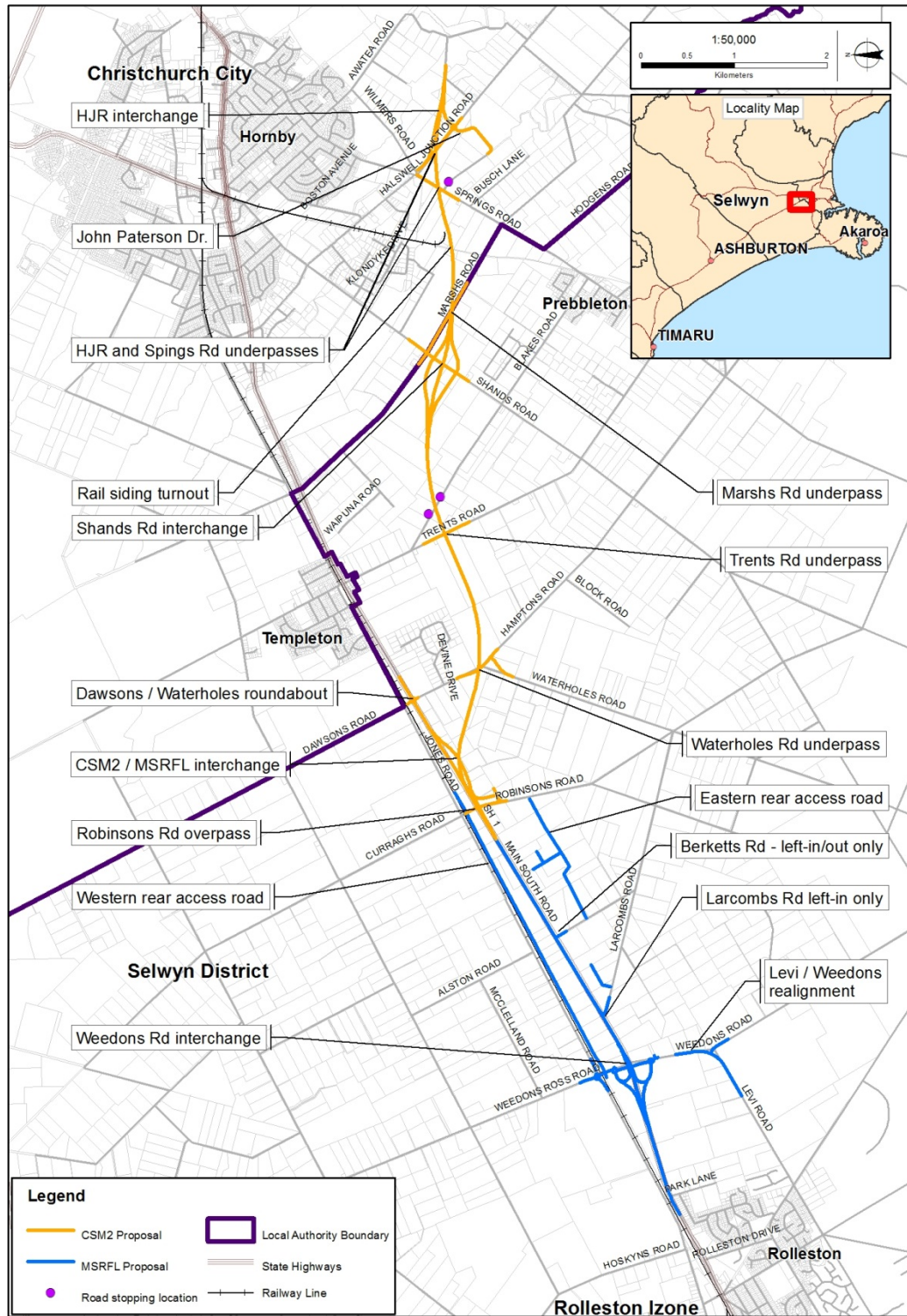
The key design features and changes to the existing road network (from south to north) proposed are:

- a new full grade separated partial cloverleaf interchange at Weedons Road;
- a new roundabout at Weedons Ross / Jones Road;
- a realignment and intersection upgrade at Weedons / Levi Road;
- a new local road running to the immediate east of the rail corridor, to the west of Main South Road, between Weedons Ross Road and Curraghs Road;
- alterations and partial closure of Larcombs Road intersection with Main South Road to left in only;
- alterations to Berketts Road intersection with Main South Road to left in and left out only;
- a new accessway running to the east of Main South Road, between Berketts Road and Robinsons Road;
- an overpass at Robinsons and Curraghs Roads (the local roads will link under the motorway);
- construction of a grade separated y-junction (interchange) with Main South Road near Robinsons Road;
- a link road connecting SH1 with Robinsons Road;
- a short new access road north of Curraghs Road, adjacent to the rail line;
- a new roundabout at SH1 / Dawsons Road / Waterholes Road;
- an underpass at Waterholes Road (the local road will pass over the motorway);
- an underpass at Trents Road (the local road will pass over the motorway);
- the closure of Blakes Road and conversion to two cul-de-sacs where it is severed by CSM2;
- a new full grade separated diamond interchange at Shands Road;
- an underpass at Marshs Road (the local road will pass over the motorway);
- providing a new walking and cycling path linking the Little River Rail Trail at Marshs Road to the shared use path being constructed as part of CSM1;
- an underpass at Springs Road (the local road will pass over the motorway);
- a new grade separated half interchange at Halswell Junction Road with east facing on and off ramps linking Halswell Junction Road to CSM1; and
- closure of John Paterson Drive at Springs Road and eastern extension of John Paterson Drive to connect with the CSM1 off-ramp via Halswell Junction Road roundabout (east of CSM2).

⁴ CSM2 will not become a motorway until the Governor-General declares it to be a motorway upon request from the NZTA under section 71 of the Government Rounding Powers Act 1989 (GRPA). However, for the purposes of this report, the term “motorway” may be used to describe the CSM2 section of the Project.

The proposed alignment is illustrated in Figure 1 and encompasses the MSRFL and CSM2 alignments between Rolleston and Halswell Junction Road.

Figure 1 Location Map of MSRFL and CSM2 Project



1.3 Construction Activities

This section contains a high level summary about the construction activities of the Project. A more detailed construction methodology is provided in Chapter 5 of the AEE and the Design Philosophy Statement (Technical Report 1). The information provided below should be treated as being indicative only. It is intended to provide sufficient detail on the proposed construction activities to assess their potential environmental effects and to identify any necessary measures to avoid, remedy or mitigate those effects, where appropriate.

Detailed work programming will depend on a number of factors, and it is recognised that once the contract for the Project has been awarded and a contractor is in place, the construction methodology will be further refined and developed. This will be undertaken within the scope of the designation and consent conditions which will be in place to manage the environmental effects of the construction activities. Construction management plans will be informed by conditions of the designations and consents to ensure all mitigation measures are implemented as required. Should a contractor wish to undertake construction activities in a manner which is not authorised by the consents held, appropriate authorisations would need to be obtained at that time.

1.3.1 Construction Programme

An outline preliminary construction programme has been developed and is shown in Appendix H. Construction of the Project is likely to take 36–48 months with work undertaken on multiple sites simultaneously at any one time. The outline programme shows enabling works (utilities, property access roads etc.) and site establishment work being undertaken first, followed by local road connections with associated structures and embankments. The CSM2 main alignment will also commence at this time followed by the MSRFL after the rear access roads are complete. Landscaping and installation of roadside infrastructure, including lighting, barriers and signage, will complete the programmed works.

1.3.2 Enabling Works

Prior to the commencement of construction of the main alignment works, it is assumed that some early enabling works will be undertaken, namely:

- relocation of significant existing businesses where required;
- treatment of Transpower's 66 kV transmission lines around Shands Road / Marshs Road intersection;
- modification of Orion utility infrastructure;
- modification of Telstra Clear and Chorus underground fibre optic cables;
- construction of Main South Road rear property access roads and accesses;
- construction of local access road connections and accesses;
- water race diversions/ modifications; and
- construction of Southern Woods Nursery access from Waterholes Road.

Four possible locations for site compounds have been identified at Weedons Road interchange, CSM2/Robinsons Road interchange, and Shands Rd interchange and near Trents Road. Additional smaller satellite compounds may be required by the contractor at each interchange or bridge location.

The main site compound(s) will contain features commonly associated with construction facilities, including temporary site buildings, material laydown areas, workers' office and workshop accommodation, plant and equipment maintenance facilities, refuelling facilities, wheel washing and cleaning facilities, car parking; and plant and equipment storage areas.

1.3.3 Construction vehicle movements

The extent of construction traffic will be dependent on the phase of works. The majority of construction vehicle movements are expected to be to/from quarries located in areas to the west of the airport (north of Main South Road). Construction vehicles will therefore access Main South Road from the north via left turn movements, predominantly from Weedons Road, Dawsons Road or Curraghs Road. Access to the project from the city will be predominantly via Shands Road and Halswell Junction Road. The specific route is dependent on the location of the site works, so other alternatives will be required for some sections.

1.3.4 Materials required for construction

Approximately 1,035,000m³ of fill will be required for the Project. Some of the fill material required will be sourced from cuts undertaken as part of the Project. The remaining bulk fill material and aggregates required for the Project are expected to be sourced from selected earthquake demolition material, local quarries or rivers (Waimakariri/ Selwyn).

All other common components of the Project will be manufactured off-site and transported in as required, including concrete, pavement surfacing materials, steel, road furniture and stormwater treatment and erosion and sediment control devices.

1.3.5 Earthworks methodology

As the Project will involve reasonably large volumes of earthworks, (generating approximately 405,000m³ of excavated material and requiring approximately 1,035,000m³ of fill material) earthworks will need to be carefully carried out. However due to the flat terrain, the effects of the bulk earthworks can be efficiently managed.

Cut slopes will be minimal, generally up to 2.9m in height with shallow cut slopes of 4h:1v. The only exception will be the Robinsons Curraghs link which passes under Main South Road in a 7m deep cutting. Cut material will be excavated mechanically and will be stockpiled or loaded directly onto trucks to be transported for use elsewhere on the Project.

The fill embankment slopes, typically up to 8m in height (but a maximum of 10.5m high), will be formed from materials sourced from cuttings but predominately from imported fill, which is likely to include selected earthquake demolition material.

It is anticipated that there will be approximately 85,000m³ of excavated (cut to waste) material that is deemed unsuitable for construction. For the most part, this material will be disposed of on site, reducing haulage distances.

1.3.6 Bridges and retaining walls

The construction of the nine bridges and associated retaining walls for the interchanges, overpasses and underpasses will be a significant part of the Project. Bridge components such as deck beams (both concrete and steel) will be manufactured in a controlled environment at an off-site facility. Other components will be cast in-situ using local ready mixed concrete providers. Both piled and spread footing bridge foundations will be used, with piles likely be either bored concrete or H-steel sections.

1.3.7 Utilities

There are several utilities that will need relocation, amendment or protection throughout the project. Each utility provider has been consulted to understand the various requirements and limitations in the local area that may impact relocation or protection of the services. These include:

- Transpower's Islington to Springston 66 kV transmission lines to the southwest of the Shands Road and Marshs Road intersection where the alignment falls within the transmission line clearance envelope;
- Orion's overhead electricity supply network;
- Chorus and Telstra Clear telecommunications networks;
- Water supply and wastewater disposal networks;
- Water Races.

The necessary written approvals and agreements to enable the works will need to be obtained at a future stage, where required.

1.3.8 Stormwater

Surface water will be dealt with differently in the MSRFL and CSM2 alignments. Main South Road and the adjacent rail embankment have impediments to overland flows, and they have little stormwater infrastructure in place. The widening of Main South Road will have little impact on the current behaviour of the catchment. Therefore, isolated soak pits in the low lying areas are proposed, with allowances for potential over topping.

For the CSM2 section at low points in the topography of the area, the surface water flood flows will pass underneath the motorway using a series of siphons. Bunds will protect the roadside swales and dispersal points. The additional disposal areas at locations of concentrated overland flows will provide protection to the road against flooding. Stockwater races will be passed under the motorway via a siphon system, typically measuring between 300mm and 450mm.

There are nine existing stockwater races, two along MSRFL and seven along CSM2, noting that a stockwater race runs parallel to MSRFL on the South Eastern side within the road reserve for approximately 2100m. These will be subject to alterations, including crossings under the

alignment, early in the Project. At locations where stockwater races are protected against overland flow, e.g. inside the Marshs Road intersection, a second siphon will be required at a similar diameter to the dry weather flow siphon for maintenance.

1.3.9 Pavement construction

The proposed materials for the CSM2 and MSRFL mainline pavement are an Open Grade Porous Asphalt (OGPA) or stone mastic asphalt (SMA) surfacing over a foamed bitumen stabilised base, which in turn overlays a sub-base. The depth of the sub-base material varies at different locations. The pavement for the local roads has still to be determined; however the surfacing is likely to be chip seal unless required for noise attenuation.

The sub-base and base course granular materials will be imported to site by trucks and laid by a grader and roller compacted to the required levels. The base layer will utilise specialist equipment to modify the material to create the foamed bitumen layer. The asphalt surfacing material will be delivered to site by trucks and laid by a paving machine.

It is likely that one main alignment carriageway will be utilised as a haul route through the site after the sub-base material has been laid. The other carriageway will be completed to seal to enable immediate protection of the pavement layers. Following completion of all earthworks, the haul route will be paved and surfaced.

1.3.10 Water requirements for construction

Water will be required for a number of construction activities, including:

- dust suppression;
- earthworks supply (moisture conditioning for engineered fill construction);
- ground improvements;
- concrete and aggregate production (placement and curing);
- irrigation for landscaping to establish a vegetation cover; and
- vehicle tyre wash to prevent tracking of sediment on roads.

Water will need to be sourced from existing wells or wells which have been relocated. The peak water demand (typically full scale construction occurring during the summer months) has been estimated at 2,500m³ per day. The volume of water required will be reduced during periods of wet weather. This water needs to be readily available across the construction site.

1.3.11 Erosion and sediment control

Erosion and sediment control will be provided throughout the duration of the construction works and maintenance period to ensure protection of the downstream receiving environment from the adverse effects of sediment from the work area. An Erosion and Sediment Control Plan (ESCP) will be required to be prepared by the Principal Contractor as part of its final CEMP and the requirements for this plan together with proposed mitigation measures is included as SEMP 002 in Appendix 2.

1.3.12 Roadside furniture and Landscaping

Once the main construction activities have been completed it will be necessary to install roadside furniture including lighting, roadside barriers and signage. Landscaping of areas that have been disturbed but are not paved will be carried out and will need to be maintained while plants establish. Further detail can be found in Landscape Management Plan (SEMP 005) in Appendix 5.

1.3.13 Traffic management

Construction of the Project involves road closures, traffic diversions and periods of lowered speed limits on some roads, all of which have the potential to cause inconvenience to road users and residents. A Construction Traffic Management Plan (CTMP) is included as SEMP 004 in Appendix 4 which details traffic management methodologies and mitigation measures to be adopted for the Project during construction.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor is reminded that the preliminary methodology and programme does not remove or overwrite the contractual obligation of the Principal Contractor to programme and determine how the works will be constructed. The main purpose of the illustrative construction methodology and programme is to identify the environmental constraints and responsibilities that the Principal Contractor will need to plan, programme and manage while constructing the works in accordance with the contract documents, designation and resources consent conditions and obligations, other relevant legislation and this CEMP.

The Principal Contractor will be required by the NZTA to submit a methodology and programme to the Engineer to the Contract (and if required the consent authorities) for approval before construction commences. The programme should demonstrate how the requirements of the CEMP have been considered, planned and programmed. The Engineer to the Contract will approve the programme in liaison with the Construction Environmental Manager ensuring environmental constraints and issues are addressed within the programme.

When the construction programme has been finalised it should be referenced to the CEMP, and if required the CEMP should be updated by the Construction Environmental Manager. The timings of the project require that all forward planning should consider the measures contained within the SEMPs, and that the construction programme and replacement SEMPs/method statements should clearly demonstrate how requirements will be met.

1.4 CEMP Policy and Objectives

To ensure that environmental management on this Project aligns with the NZTA's policy framework for environmental management, the Project will be undertaken in accordance with the NZTA Environmental Policy, objectives and key performance indicators.

1.4.1 NZTA Policy

The NZTA has a number of policies governing its operations in accordance with s96 of the Land Transport Management Act 2003 that defines the Agency's operating principles particularly the need to exhibit a sense of social and environmental responsibility (s96(1)(a)). In this regard the NZTA's Environmental and social responsibility policy⁵ states:

Section 96(1)(a) of the Land Transport Management Act requires that the NZTA exhibit a sense of social and environmental responsibility. We promote an accessible and safe transport system that contributes positively to New Zealand's economic, social and environmental welfare, and we are committed to acting in an environmentally and socially responsible manner.

We are committed to: protecting and enhancing the natural, cultural and built environment, enhancing the quality of life for New Zealanders by improving community liveability including land transport safety, taking appropriate account of the principles of the Treaty of Waitangi, providing meaningful and transparent engagement with stakeholders, customers and the general public and providing customer focused services that are fair, trusted and efficient.

To implement our policy we will:

- promote the safe and efficient movement of goods and people in a manner that avoids, to the extent reasonable in the circumstances, adverse environmental and social impacts;*
- continuously improve performance in the management of environmental and social impacts;*
- integrate good urban design into all our activities;*
- work to improve our knowledge and understanding of the extent and condition of New Zealand's environmental and cultural heritage assets;*
- maintain and improve opportunities for Maori to contribute to our decision-making processes;*
- actively and meaningfully engage with affected and interested persons and organisations;*
- identify and comply with all relevant environmental and social legislation and regulations;*
- seek whole-of-life value for money by taking into account environmental and social costs and benefits when procuring goods and services; and*
- provide our employees with the skills, awareness and leadership to achieve environmental and social objectives.*

1.4.2 Environmental Objectives

The NZTA adopted the Transit New Zealand (TNZ) Environmental Plan 2008, which outlines key social and environmental impacts that are relevant to the NZTA's activities. Objectives associated

⁵ NZTA Statement of Intent 2011-2014 p28

with these impacts are provided and those relevant to construction of CSM2 and MSRFL are described in Table 1 below.

Table 1 Summary of relevant NZTA environmental objectives provided in the NZTA Environmental Plan 2008

Environmental Impact	Relevant Environmental Objective/s
Noise	N3 Manage construction and maintenance noise to acceptable levels
Air quality	None specifically related to construction activities
Water resources	<p>W1 Ensure runoff from State Highways complies with RMA requirements</p> <p>W2 Limit the adverse effects of run-off from state highways on sensitive receiving environments.</p> <p>W3 Ensure stormwater treatment devices on the network are effective.</p>
Erosion and sediment control	<p>ES1 Ensure construction and maintenance activities avoid, remedy or mitigate effects of soil erosion, sediment runoff and sediment deposition</p> <p>ES2 Identify areas susceptible to erosion and sediment deposition and implement erosion and sediment control measures appropriate to each situation with particular emphasis on high-risk areas</p> <p>ES3 Use bio-engineering and low-impact design practices where practicable</p>
Social responsibility	None specifically related to construction activities
Culture and heritage	H1 Proactively limit the disturbance of significant cultural and heritage features along state highways
Ecological resources	<p>E2 No net loss of native vegetation, wetlands, critical habitat or endangered species</p> <p>E3 Limit the spread of plant pests</p>
Spill response and contamination	<p>S1 Design stormwater control and retention devices that can accommodate spills in areas of high environmental risk</p> <p>S2 Ensure the removal, placement and disposal of contaminated soils is achieved in accordance with the Soil NES</p>
Resource efficiency	None specifically related to construction activities

Environmental Impact	Relevant Environmental Objective/s
Climate change	C3 Mitigate activities associated with the construction, operation and maintenance of state highways to effect a net reduction of GHG from transport
Visual quality	None specifically related to construction activities
Vibration	<p>V2 Mitigate vibration where levels are unreasonable and exceed relevant criteria set in New Zealand or internationally accepted thresholds</p> <p>V3 Avoid or reduce, as far as is practicable, the disturbance to communities from vibration during construction and maintenance</p>

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.

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2. Part B – Social and Environmental Management

This section outlines significant environmental issues identified in the AEE. It is intended to be used to:

- Outline the existing environment;
- Identify matters to be included in the Specialised Environmental Management Plans (SEMPs) or in General Control Statements (GCS's); and
- Outline any recommendations in technical reports relating to environmental management during the construction phase.

2.1 Environmental Management

2.1.1 Identification

The environmental impacts that are discussed within this CEMP have been derived from three information streams:

1. AEE – The potential environmental impacts for the project have been identified within the Assessment of Environmental Effects (AEE). This document has analysed potential effects and identified the levels of risk and significance for each potential impact as well as identifying measures to avoid, remedy or mitigate adverse effects.
2. NZTA – The NZTA Environmental Plan 2008 set of objectives, (referred to in section 1.4.1 above), are based on known impacts for its road projects. The list of impacts has been based upon NZTA's Social and Environmental Management form⁶ but adapted to focus on construction activities associated with the Project. This plan only identifies potential impacts, and does not risk assess for the significance as this has to be done project by project.
3. CEMP as a living process – This CEMP requires the Principal Contractor to review risks and potential impacts that have been identified, which results in an always current understanding of potential impacts upon the environment.

Each of the issues identified as requiring significant controls have been discussed in a SEMP to address risks and set out appropriate management. General Control Statements (GCS) that cover more general matters that do not require specific management plans are also recommended.

2.1.2 SEMPs

The need for SEMPs has been determined by an understanding within the AEE of the:

- Potential construction risks and effects;
- Environmental receptors; and
- Construction activities.

⁶ <http://www.nzta.govt.nz/resources/state-highway-professional-services-contract-proforma-manual/forms/docs/sm030-psf13-v2-1mar10.pdf>

The specialist subject author contributing to the technical reports has been responsible for the development of the appropriate SEMP. The SEMPs can be regarded as plans to either protect the environment or manage a construction activity. In effect they are a combination of impacts and operational management plans. The following outlines the SEMPs that are addressed within this CEMP (refer Appendices A to F of this CEMP).

- SEMP 001 Air Quality Management (Dust)
- SEMP 002 Erosion and Sediment Control
- SEMP 003 Construction Noise and Vibration Management
- SEMP 004 Construction Traffic Management
- SEMP 005 Landscape Management
- SEMP 006 Accidental Aquifer Interception Management

2.1.3 General Control Statements

Below the SEMPs sits another layer of controls termed General Control Statements (GCS). The GCS cover the less significant issues for the Project, could lead to a localised impact on the environment. While a SEMP is a discrete management plan that is complementary to this CEMP, it is also a self-contained document that covers specific issues from the AEE. A GCS is a control statement that is reliant on the CEMP for systems support

It is expected that prior to construction commencing that the Principal Contractor will need to provide evidence to the NZTA that the following matters are covered in its own Environmental processes.

- Hazardous Substances and Spillage Response
- Accidental discovery of contaminants;
- Terrestrial Ecological Protection;
- Construction lighting;
- Utilities management;
- Materials and Waste Management; and
- Good housekeeping (a general statement that covers issues and controls not considered elsewhere).

In addition the contractor will need to provide evidence of its processes in relation to accidental discovery of koiwi, taonga or archaeological material. Specifically an Accidental Discovery Protocol covering NZTA New Zealand Regions 11 (Canterbury) and 12 (West Coast) is in place to manage any such occurrences while NZTA have also adopted the Ngai Tahu Koiwi Tangata Policy 1993 relating to unknown burials. The NZTA Accidental Discovery Protocol is attached as Appendix I.

2.2 Existing Environment

Prior to considering specific construction impacts it is important to provide the physical context.

The Project is located on the outskirts of Christchurch, within the Canterbury Region. There is a diversity of urban and rural land use within the Project area, ranging from open farmland, rural lifestyle blocks and urban areas. The residential communities in proximity to the alignment extend from south west Christchurch, where Hornby is the dominant commercial centre, to the towns of

Rolleston and Lincoln, including the towns of Templeton and Prebbleton. In the area close to the alignment, there is the rural area of Weedons and recent rural-residential subdivisions at Aberdeen and Claremont.

The environmental baseline is described in the AEE (Section 3) and should be referred to for a more in-depth description of the existing environment. The following table provides an outline of the existing environment assessed for each of the specialist technical reports. The respective report should be referred to for further and more detailed information.

Table 2 Existing environment

Feature	Description	AEE technical specialist report
Air Quality	<p>The easternmost end of CSM2 between Halswell Junction Road and Springs Road is situated within the Christchurch Clean Air Zone 2 as identified in the Canterbury NRRP, although this is not a gazetted airshed, in terms of the National Environmental Standards for Air Quality. The remainder of the Project is outside of the clean air zones.</p> <p>There are a number of sensitive receptors within the project area, namely residential houses within 200m of the proposed CSM2 and MSRFL alignments.</p>	Technical Report No. 10

Feature	Description	AEE technical specialist report
<p>Terrestrial Ecology</p>	<p>The project is located within pastoral farmland on the south west outskirts of Christchurch in an area of the Canterbury Plains that has been largely cleared of indigenous vegetation cover.</p> <p>Land Environments of New Zealand (LENZ) classifies the land traversed by the proposed motorway into three acutely threatened land environments, I3.2b, J2.1b and N1.1a being flat plains differentiated according to soil drainage and fertility and the parent material.</p> <p>The Project area contains no land administered by the Department of Conservation or any designated areas of natural significance. An ecological heritage site exists on the corner of Wilmers and Springs Road where an area of semi-natural <i>Danthonia</i> grassland exists and a RAP encompassing an area of flax and swamp kiokio (<i>Blechnum minus</i>) by a water race adjacent to Marshs Road. Both these areas lie outside the designation and will not be affected by the Project.</p> <p>As a result of investigations carried out to date there is a high likelihood of populations of indigenous lizards that may be disturbed by construction activities.</p>	<p>Technical Report No. 18</p>
<p>Aquatic Ecology</p>	<p>The majority of habitats in the South-West are highly modified and show evidence of degradation by existing land uses. Indigenous vegetation is fragmented and reduced to remnant patches. The study area contains no natural waterways or wetlands but does contain a number of manmade water races of limited ecological value. There are no sites of conservation significance such as ecological heritage sites, Recommended Areas for Protection (RAPs) or significant natural areas within the motorway footprint.</p>	<p>Technical Report No. 17</p>

Feature	Description	AEE technical specialist report
Noise and Vibration	The dominant noise source affecting the ambient noise environment at dwellings close to the roads within the Project area is traffic. The majority of dwellings within the noise assessment area are accessed directly from, or are in close proximity to existing roads, namely Springs Road, Shands Road and Main South Road. Ambient noise levels at these locations are primarily affected by traffic flow and by local obstacles such as perimeter fences and other dwellings. Dwellings in these locations are in both the Rural 2 and Inner Plains zones under the Christchurch City Plan and Selwyn District Plan respectively.	Technical Reports No. 8 and 9
Land use, Topography and Landscape	Land use in the surrounding area is predominantly rural and semi-rural, with a mixture of dairy farming, horticulture, cropping, lifestyle blocks and agricultural activities, with the exception of the eastern end of the alignment and the northern side of Main South Road, where some industrial land use exists. The landscape along the proposed alignment is characterised by flat alluvial plains, and the overall setting is rural characterised by open space and dominated by pasture and shelterbelt vegetation.	Technical Reports No. 4, 5, 6, and 7
Geology	The Project area is covered by river alluvium soils of Yaldhurst and Halkett Members in the Springston Formation of the Holocene age. Historical use of underlying loess soils in the CSM2 section for horticulture and agricultural activities have potentially influenced the composition of these soils.	Technical Report No. 11
Hydrology	The Project area consists of a network of water races which are owned and operated by Selwyn District Council. The majority of the catchment subject to the proposed Project does not directly contribute to any natural watercourse (stream).	Technical Report No. 3
Traffic and Transport	The traffic and transport network within the Project area has been described and assessed for the existing road network, public transport, cycle and pedestrian routes and railway infrastructure.	Technical Report No. 2

Feature	Description	AEE technical specialist report
Groundwater	The regional groundwater depth is in the order of 12 to 20 m below ground level towards Rolleston, becoming gradually shallower with proximity to the city and measuring 3 to 5 m below ground level at the Springs Road junction. The gradient is generally towards the south east, reflecting the same gradient as ground levels across the same area. No artesian water was encountered during project investigations.	Technical Report No. 11
Ground Contamination	No contamination issues were identified within the designation of the alignment. Contaminated soils outside of the designated alignment were encountered at the former Southbridge Branch Rail Line and former gravel pit north of the alignment near Springs Road. The north east corner of Main South Road and Curraghs Road is recorded on the Canterbury Regional Council (ECan) Listed Land Use Register (LLUR) as a landfill site (site no. 3789).	Technical Report No. 16
Archaeology, Culture and Heritage	There are two recorded archaeological sites of Māori origin in the general vicinity of the Project area, both of which were middens/ovens. These indicate that Māori people were passing through this area, possibly on their way to Banks Peninsula or Lake Ellesmere where important resources were present. There is little evidence to suggest there were any settlements in the area.	Technical Reports No. 12 and 15
Social	The social assessment area was defined as extending from southwest Christchurch city, where Hornby is the dominant commercial centre, to the towns of Rolleston and Lincoln, and including the towns of Templeton and Prebbleton. It also considers construction effects.	Technical Report No. 13
Economic	The economic assessment considers the economic effects and benefits of the Project on community economic wellbeing within the Project area including during construction.	Technical Report No. 14

2.3 Project Construction Environmental Issues

Based on the understanding of the construction programme and the understanding of the local environment (from the Assessment of Environmental Effects) the environmental issues are discussed and potential mitigation measures are outlined.

The following sections identify project related potential impacts, the guidance for the management of the impacts and the project issues that need to be considered in the management of the impacts. Thereafter each section concludes with a reference to either a SEMP or a possible GCS, and sets out the expectations for the appointed Principal Contractor.

2.3.1 Air quality management (SEMP 001)

Potential Impacts

The construction of the Project will entail relatively large scale earthworks. Exposed earthworks can be a significant source of dust which 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 by dust depositing in areas without sediment control measures. Sediments deposited on sealed public roads can also result in a dust nuisance. Rainfall, water evaporation, and wind speed, are meteorological conditions having the greatest effect on dust mobilisation.

The following are potential sources of dust and other air contaminant discharges associated with the construction phase of the project.

- dust from roads and access areas generated by trucks and other mobile machinery movements during dry and windy conditions;
- excavation and disturbance of dry material;
- loading and unloading of dusty materials to and from trucks;
- smoke and odour from diesel-engine machinery and truck exhausts; and
- stockpiling of materials including material placement and removal.

Project-Specific Issues and Requirements

The most effective way to control construction dust is through good on-site management. Mitigation measures include:

- wind break fencing;
- dust suppression – through the use of using water sprinkler systems during dry conditions;
- semi-permanent working areas and construction site access roads should be constructed with an appropriate base, kept metalled, and kept damp.
- managing the extent of earthworks especially during dry conditions;
- excavated areas should be watered as necessary, or preferably stabilised e.g. through metaling, grassing or mulching;
- stockpile dampening and covering;
- minimising stockpile drop heights;
- plant and vehicle maintenance and management –
- managing vehicle and tyre wash-down areas to avoid dust nuisance

- setting vehicle speed limits;
- minimising and managing material spills.

All construction activities should follow the guidance set out in SEMP 001 Construction Air Quality (Dust) is contained within Appendix A while chapter 18.5 of the AEE also contains a detailed list of the proposed mitigation measures to be adopted for this Project.

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in SEMP 001 Air Quality Management Plan within Appendix A of this CEMP of this CEMP should be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.2 Erosion and Sediment Control (SEMP 002)

Potential Impacts

The scale of the Project means that a relatively large area of land will be disturbed. Erosion and sediment control will need to be provided throughout the duration of the construction works and maintenance period to ensure protection of the downstream receiving environment from the adverse effects of sediment from the work area. As much of the receiving environment is groundwater, the protection of the groundwater aquifer is also required.

Project-Specific Issues and Requirements

Key issues which will require addressing include:

- control of stormwater and isolating runoff from the stock-water network;
- separating clean from dirty water;
- protecting adjacent landowners from surface flows;
- minimise sediment leaving the site; and
- disposal to land.

One of the key mitigation measures is sediment retention ponds, where the number, sizing and location of sediment retention ponds will be relative to the size of the land area subject to. Where higher sediment loads are expected (typically in larger catchments and/or on steeper cut slopes) the effectiveness of ponds will be increased through the addition of a chemical flocculation agent. This causes sediment to bind together and hence fall out of suspension.

More detail regarding erosion and sediment control measures for the Project is set out in Appendix B of the CEMP, which contains the Draft Erosion and Sediment Control Plan for key sectors of the Project and section 19.5 of the AEE.

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations out in SEMP 002 within Appendix B of this CEMP should be followed and where necessary be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

Erosion and sediment control should be provided by the Principal Contractor throughout the duration of the construction works and maintenance period to ensure protection of the downstream receiving environment from the adverse effects of sediment from the work area.

The Erosion and Sediment Control Guidelines document prepared by ECan should be used as the principal basis for the formation of an Erosion and Sediment Control Plan. The NZTA Erosion and Sediment Control Standard for State Highway Infrastructure should be used in order to reinforce best industry practice.

2.3.3 Construction Noise and Vibration (SEMP 003)

Potential Impacts

The construction of the Project will require the use of large mobile mechanical equipment and processes that are likely to generate elevated levels of noise at the nearest residences. As such, there are likely to be some significant temporary noise effects through the construction phase.

Construction noise is expected from the following activities.

- Enabling Works using heavy machinery e.g. excavators, compactors, rollers;
- Topsoil Stripping through the use of motor scrapers;
- General Earthworks (Main Alignment and Bridges) utilising heavy machinery e.g. excavators, compactors, spreaders;
- Ground Improvements utilising vibratory construction techniques and most piling activities using rollers/compactors and boring concrete piles.
- Bridge Construction abutment preparation using driven steel piles or auger piles.
- Installation of precast bridge structures.
- Pavement Construction where there is likely to be multiple items operating simultaneously.

Sources of vibration identified as being most likely to cause building damage are vibratory rollers and piling. Other construction machinery and activities such as truck movements and excavators will also produce ground vibration. Prior experience has shown that these activities can give rise to adverse effects (particularly adverse human response).

Project-Specific Issues and Requirements

Construction noise effects are assessed in relation to the recognised construction noise standard NZS 6803:1999, which contains recommended noise criteria that are considered appropriate and applicable to noise from construction operations.

The Standard provides for higher noise levels during normal working hours for construction noise received in residential areas in order to enable normal construction activity to take place. For commercial and industrial areas, higher noise criteria are allowed during night-time when it is less likely that people or business activity will be affected by construction noise.

The AEE (section 17.6– 17.9) outlines general and specific mitigation measures. These include

- The restriction in the use of heavy machinery outside of specified working hours for enabling works, topsoil stripping, general earthworks, ground improvements, bridge construction and pavement construction.
- Site specific measures relating to the proximity of sensitive receivers including temporary noise barriers.
- General good practice techniques including training of personnel, maintenance of equipment, equipment enclosures to attenuate noise at source, selection of low noise plant and avoiding night time activities;
- Temporary relocation of residents (only where absolutely necessary); and
- Consultation and communication with sensitive receivers.
- The most effective way to control construction noise and vibration is through good on-site management, with measures to be implemented through the CNVMP.

In relation to vibration, for crucial activities, such as vibratory compacting and piling where large vibration energy is typically produced, test measurements of the initial works are recommended. As the number of on-site measurements increases, the models can be refined to allow more accurate prediction of the subsequent construction stages and improved controls can be achieved.

More detail regarding noise and vibration control measures for the Project is set out in Appendix C of the CEMP, which contains the Draft Construction Noise and Vibration Management Plan for key sectors of the Project.

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in SEMP 003 Construction Noise and Vibration Management Plan within Appendix C of this CEMP should be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.4 Traffic management (SEMP 004)

Potential Impacts

Temporary traffic management for the construction of the Project will be required. The potential impacts identified include:

- the need to minimise disruption on State highways and local roads as far as is practicable and maintain existing flows and travel times;
- the desirability of minimising the number of construction vehicle trips and their effects on local roads and seek to avoid residential areas where practicable;

- the need to minimise the effects of construction vehicle parking;
- the importance of providing for effective communication and the gathering of feedback from key affected parties; and
- providing a safe environment for the general public and construction staff during construction.

Project-Specific Issues and Requirements

There are several aspects to this and Site Specific Traffic Management Plans (SSTMP's) will be required to be implemented. These are included in Technical Report 2 and in SEMP 004 and are summarised below.

Co-ordination of Traffic Management – An overarching construction sequencing plan will be required that identifies the various activities that will take place and when. The outline details of the temporary traffic management will be included in the construction sequencing plan in order to identify the potential cumulative traffic effects associated with several construction locations being active at the same time. The aim of the sequencing plan will be to avoid and/ or mitigate significant traffic effects arising from multiple activities that individually result in only marginal effects.

Traffic Effects – Whilst increased traffic congestion is to be anticipated with the majority of temporary traffic management measures can be put in place to minimise disruption to the greatest extent possible. This applies to traffic on a given route and traffic on diversion routes. Alternative methodologies may need to be considered or mitigation measures to minimise the effects, such as:

- undertaking works at times of low traffic flow (school holidays or night works);
- advanced communication of the works to pre-warn the public or enable them to think of alternative routes.

Site Access – The site accesses will need to be considered and will need to operate in a safe manner that does not cause undue disruption to general traffic flows. The SSTMPs will need to consider the following with regard to site accesses:

- signage to identify the accesses for delivery vehicles and suppliers;
- permitted vehicles (trucks / articulated trucks / cars) and permitted uses (visitors / deliveries / staff);
- permitted movements and / or movement restrictions e.g. left in / left out;
- pedestrian, cycle and public safety;
- deceleration and acceleration requirements to minimise traffic disruption and provide for safe access/ egress.

Diversions – Road closures are anticipated to be required on some of the local roads to enable the construction of structures. These closures and the proposed diversion routes would be discussed with the Road Controlling Authorities prior to implementation. The diversion routes would utilise arterial roads and avoid residential areas where possible.

Property Access – Measures to minimise the effects on property access (including turning restrictions) and on-site parking / manoeuvring are included in SEMP 005. Consultation will need

to be undertaken with affected property owners where they are affected to identify the impact on their access, duration and date of work. All reasonable steps to maintain property access or a satisfactory alternative route will be implemented.

Passenger Transport – All practical steps will need to be taken to minimise any effects of the on passenger transport services. Consultation will need to be undertaken early in the construction planning stage to identify the potential passenger transport effects. This consultation will include:

- Environment Canterbury
- Christchurch City Council
- Selwyn District Council
- Passenger Transport Operators
- Ministry of Education (with regard to school bus services).

Walking and Cycling – Pedestrian and cycle requirements (including the mobility impaired) will need to be considered and the likely effects identified. Suitable alternative access will be incorporated which may include the following:

- temporary access in accordance with recognised standards;
- temporary diversions or routes;
- safety fencing and protection barriers from traffic;
- temporary bridges across uneven surfaces.

Long-term closures or diversions will be discussed and agreed with the appropriate Road Controlling Authority. More detail regarding construction traffic control measures for the Project is set out in Appendix D of the CEMP, which contains the Draft Construction Traffic Management Plan. Construction Traffic Management is also considered in chapter 11.7 of the AEE.

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in SEMP 004 Construction Traffic Management Plan within Appendix D of this CEMP should be followed and where necessary be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager. The Principal Contractor should provide information regarding anticipated site compounds and lay down points, and traffic management plans or method statements for effective traffic management.

2.3.5 Landscape (SEMP 005)

Potential Impacts

Temporary landscape and visual effects will result from construction of the project. The visual effects of removal of existing vegetation may also have short term effects in particularly sensitive locations. Soil exposed by earthworks can have visual effects depending on the length of time it is exposed. The location of vehicle accesses and the location of stockpiles of excavated material or hardfill can also have adverse visual effects.

Project-Specific Issues and Requirements

The approach to landscape management should take into account the following:

- preserving and complimenting the existing landscape and rural qualities that characterise the receiving environment, through retaining existing vegetation where possible and replicating existing landscape / planting patterns;
- protecting valued view shafts such as views to the Port Hills and Canterbury Foothills by retaining and or providing gaps in existing and proposed vegetation;
- identifying areas where plantings are required for visual screening and improving amenity. The visual screening will be located to control headlight glare, “back dropping” curves and intersections and obscuring views of the motorway from adjoining residential properties;
- the provision of screen planting to ensure a high quality experience for users of the motorway;
- choosing plant species to reflect the local landscape character;
- the selection of native and exotic plant species that are appropriate to and will thrive in the local environment;
- the development of a visual theme to promote consistency and continuity with CSM1 and other local sections of SH1; and
- earth mounding as enhancement for a length of 700 m to the south of the proposed alignment, between Trents Road and Shands Road. These mounds will be approximately 2m high gently contoured features with areas of landscape planting (trees) to provide visual amenity to neighbouring properties and motorway users.
- specific riparian planting adjoining Stockwater races affected by the Project.

More detail regarding landscaping measures for the Project is set out in Appendix E of the CEMP, which contains the Draft Landscape Management Plan.

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in the SEMP 005 Landscape Management Plan within Appendix E of this CEMP should be followed and where necessary be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.6 Ecological management (freshwater, terrestrial)

Potential Impacts

Freshwater – There are no natural watercourses throughout the project length however there are a number of stock water races that maintain aquatic habitats. Potential adverse effects on aquatic ecology during construction relate to potential sedimentation and contamination of water races and habitat disturbance.

Terrestrial – Adverse effects on terrestrial ecology will be most pronounced during construction when sections of shelterbelt, stands of trees and areas of pasture are removed. The two potential direct impacts on terrestrial ecology are the loss of habitat through clearance and earthworks; and disturbance, displacement, injury and mortality of birds and lizards.

The effect of vegetation removal on indigenous fauna arising from the loss of those habitats has been considered as no more than minor due to the similarity of nearby habitats and wide ecological tolerances and adaptability of the affected indigenous bird species. However the protection of lizards in the project area has been identified as having particular importance.

Project-Specific Issues and Requirements

Freshwater – There is the potential for long term positive effects to be realised through riparian enhancement of realigned and other existing water races within the project area and improved water quality through stormwater treatment. In addition, culverts will be designed to ensure the provision of fish passage or where the proposal involves long sections of piping, fish screens will be included to prevent entry and stranding of fish. In addition management of sediment (SEMP 002) and landscaping (SEMP 005) will assist in maintaining and enhancing the aquatic environment.

Terrestrial – The Project presents an opportunity to enhance the ecological value of the affected and surrounding land, which is highly modified and contains little in the way of naturally occurring indigenous vegetation. The proposed landscape measures will also mitigate the adverse effects of the Project resulting from habitat loss and disturbance.

Extensive landscape mitigation measures are proposed as part of the Project. These incorporate a large component of totara/matai forest and shrubland plantings that in combination with mixed indigenous/exotic woodland plantings this will significantly enhance ecological values within a highly modified landscape. Low plantings of appropriate species proposed along sections of stock water races will improve the habitat value of the riparian margins and their connectivity at a landscape scale. A GCS concerning Terrestrial Ecological Protection is recommended to be developed that sets out an approach to manage terrestrial features such as existing vegetation that is to remain within the Project area from any construction activities undertaken. The procedure shall also include an approach to minimise introduction and colonisation of pest species.

The landscaping also provides the ability to accommodate boulder fields and boulder strips that can include appropriate planting to mitigate against any habitat loss as a result of the development. The incorporation of boulder fields will be confirmed upon the outcome of the lizard survey which is currently being undertaken.

CEMP Expectations for the appointed Principal Contractor

The SEMP for Erosion & Sediment Control (SEMP 002 within Appendix B of this CEMP) and the Landscape Management Plan (SEMP 005 within Appendix E of this CEMP), should be followed and where necessary be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager. A General Control Statement for Terrestrial Ecological Protection should also be developed.

2.3.7 Groundwater management

Potential Impacts

Existing groundwater levels have been a key influence in the design of the Project, as it has dictated the vertical level for the road and preventing the placement of the Project into a cutting. While groundwater levels can change over time, the risk of groundwater inundation is considered to be low given the dispersed nature of the disposal system, meaning that failure of any individual soakage device is unlikely to cause inundation of the road.

In general terms the groundwater is currently at sufficient depth not to impact on the construction of the Project. It is not envisaged that large scale dewatering systems will be required during the construction phase, although some localised dewatering during deeper trenching or excavations may be needed on a site by site basis. There is however a possibility that during construction groundwater will be encountered.

Project-Specific Issues and Requirements

The proposed stormwater treatment measures and implementation of the CEMP will avoid contamination of the Christchurch Groundwater Protection Zone. However ECan have advised that during a recent subdivision near to the project that groundwater was encountered and that there needs to be a process for capping and confining any springs or other groundwater encountered. In response to this a specific and targeted management plan has been developed entitled “Accidental Aquifer Interception Management Plan” (SEMP 006). This outlines practices to be undertaken should the aquifer be accidentally intercepted during construction including methods to cap and confine groundwater encountered.

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in the Accidental Aquifer Interception Management Plan (SEMP 006 within Appendix F of this CEMP), of this CEMP should be followed and where necessary be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.8 Hydrology & Stock race management

Potential Impacts

The key stormwater issues are the collection and disposal of stormwater generated within the Project, the passage of stock-water race flows beneath the Project and the passage of overland flows generated in the upstream catchment beneath the Project.

The majority of the catchment crossed by the Project does not directly contribute to any natural watercourse. Surface water typically ponds in local depressions on the catchment surface and soaks to land or evaporates. In larger events overland flows have the potential to flow along surface flow paths. These overland flow paths are often intercepted by field drains, irrigation channels and the existing stock-water race network, which either eventually discharges to the Halswell River or discharges to land via engineered soak pits.

Nine stockwater races cross the current project alignment. Many or all of these races are piped under the existing SH1 and local road network. Some of the races are in pipes at grade, with the balance depressed under the carriageway in pipes but using the (inverted) siphon principle.

Stockwater races perform a land drainage function during heavy rainfall events. During or prior to such events, the upstream stock water race intakes are closed or shut off. SDC advises that runoff can exceed water race capacity and some localised flooding does occur. Stockwater races in some cases need either to be closed or realigned and this is discussed in Technical Report 3. The key potential issues are:

- ensuring that the stockwater races can still fulfil their land drainage and stockwater functions;
- that construction of closed or realigned stockwater races is carried out without sediment entering the system and limited effect on aquatic ecosystems;
- that riparian landscaping occurs that will enhance aquatic ecosystems; and
- that users of the stockwater races have the ability to comment.

Project-Specific Issues and Requirements

Technical Report 3 and Chapter 19 of the AEE outline the four key stormwater issues which need to be addressed with the proposed infrastructure:

- collection and disposal of stormwater generated within the Project;
- passage of stock-water race flows (both wet and dry weather) beneath the Project; and
- passage of overland flows generated in the upstream catchment beneath the Project.
- adaptation and integration of installed detention and collection systems (e.g. as a part of CSM1).

In terms of stockwater a series of proposed siphons will be used to convey stock-water races from one side of the MSRFL and CSM2 alignments to the other. A second parallel pipe has been proposed to maintain the land drainage function of the races and to prevent flooding immediately upstream of the crossing points.

A shallow earth 'spillway' is proposed near the crest of the existing water race to allow the activation of the second, normally dry pipe. Thus after a significant rainfall event has passed the secondary siphon pipe will drain to a short soakage trench and drain away leaving a dry pipe.

Closure of stock-water races is proposed in a limited number of locations. Given the likelihood of penetrating the porous subsoil layers the races may have to be lined to prevent water loss. In addition riparian landscaping is proposed as part of the Landscape Management Plan (SEMP 005) while sediment potentially entering the system will need to be managed in accordance with an approved Erosion and Sediment Control Management Plan (SEMP 002).

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in SEMP 002 Erosion and Sediment Control Plan (within Appendix B of this CEMP) and SEMP 005 Landscape Management Plan (within Appendix E) should be reviewed and updated once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.9 Construction Lighting

Potential Impacts

Lighting from construction activities can have an adverse effect on amenity through glare and light spill, if it is not appropriately managed particularly for sensitive receivers close to the alignment.

Project-Specific Issues and Requirements

Construction lighting is temporary in nature. Management of any lighting effects and the avoidance of any glare or light spill will be a matter of good practice. Any potential adverse effects will need to be mitigated through a GCS produced by the contractor that will contain the following mitigation measures in respect to lighting:

- careful location of site offices and equipment in relation to any nearby residential or sensitive areas; and
- use of lighting fixtures that do not produce spill glare or upward light above the relevant standards.

In addition it will be important to have a feedback process to manage any concerns that there may be. This is covered in detail in Chapter 3 below.

CEMP Expectations for the appointed Principal Contractor

Once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager a GCS on construction lighting should be developed and implemented.

2.3.10 Hazardous substances and spill response management

Potential Impacts

The management of any hazardous substances by a contractor is a key factor as unintentional discharges can have an effect on land or potentially the water resource. It will be important that measures are in place to avoid unintentional discharges. However based on the experience of constructing CSM1, it is expected that less than 5000 litres of hazardous substances (primarily diesel) will be stored on site at any one time during construction.

Project-Specific Issues and Requirements

There are a number of relevant conditions in the Natural Resources Regional Plan (NRRP) and the Proposed Land and Water Regional Plan (PLWRP). These include hazardous substance design, containment, management and certification along with location restrictions including not within 20m of a bore, not within a flood area or within 100m of an active fault if it has been assessed that these can be met. There are no known faults at ground surface or mapped within the project area, and any areas identified as being prone to flooding can be avoided.

However measures to be considered include bunding or metalling surface storage areas, providing spill response procedures, spill kits and factors such as no refuelling within 50 metres of any watercourses including stockwater races. Even though the storage of hazardous substances will be low in volume the NZTA is seeking consent for the use and storage of hazardous substances due to the PLWP limitation of 2000 litres stored at any one time. In any event management of any hazardous substances and the avoidance of any spills will be a matter of good practice.

CEMP Expectations for the appointed Principal Contractor

A GCS Hazardous Substances and Spillage Response Plan should be developed once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.11 Soil Contamination Discovery

Potential Impacts

Soil Contamination investigations have been undertaken along and adjacent to the proposed CSM2 and MSRFL alignment. The results of this investigation conclude that contaminants do not exceed relevant standards (see Technical Report 16 and Chapter 22 of the AEE). Remedial action resulting from soil contaminant concentrations is therefore not required.

Even though a soil contamination assessment has been completed for the alignment, it is possible that unexpected contamination is encountered during the construction phase of the project, and this soil will need to be managed in an appropriate manner.

Project-Specific Issues and Requirements

An outline of recommended steps to be taken if contaminated soil is discovered during the construction phase is provided below. Actual contingency action will be site specific and dependant on the extent and nature of the discovered contamination.

Contaminant indicators in soil may include:

- Visual (buried refuse, metal objects, building material, soil or water staining/bleaching or discolouration),
- Olfactory (fuel, sulphurous, rotting vegetation or sewage)
- Auditory (gas leaks, flowing or dripping liquid).
- Fibrous cement based board materials may contain asbestos.

If any such indicator is observed during earthworks, the following steps should be taken:

- Cease all work within a 20 m radius and make the work safe;
- If possible contain any contaminant dispersion and shut off/divert any water flow; and
- Advise the Site Manager

The construction manager shall assess the site. If the assessment concludes that confirmation of contamination is required, the Site Manager shall:

- Control the site: install temporary fencing, temporary cover, silt traps and bunding as required around the exclusion zone;
- Notify the project manager that contamination has been discovered;
- Small volumes of excavated soil shall be contained in covered skips to control leachate formation from rainfall;
- If this is not possible, larger volumes should be covered and banded to manage storm water; and
- Dispose of any pooled rainwater to an appropriately licensed treatment facility and must not be discharged to the construction storm water system.

The construction manager representative shall:

- Notify NZTA that suspected contamination has been discovered and contingency action is being taken;
- If landfill gas or leachate breakout is suspected, arrange for an immediate field investigations and recapping of the affected area to contain the discharge;
- Direct appropriately trained and qualified personnel to collect samples for laboratory analyses using appropriate procedures;
- If fibrous cement based board materials are encountered, direct appropriately trained personnel to collect samples for analytical testing to confirm/disprove the presence of asbestos.
- Arrange the analysis of soil and/or water samples by an IANZ accredited laboratory;
- Assess the results against the National Environmental Standard for Assessing and Managing contaminants in Soil to Protect Human Health, January 2012 and relevant risk based environmental acceptance criteria where appropriate;
- Advise should be sought from an appropriately qualified contaminated land practitioner on suitable course of action for the contaminated soil and/or water, and any specific health and safety precautions that may need to be taken to minimise risk to construction workers / and or general public;
- Where friable asbestos containing materials are confirmed in the soil matrix, all works (including the excavation and disposal of affected materials) shall be undertaken in accordance with the Health and Safety in Employment (Asbestos) Regulations 1998, and the Department of Labour Guidelines for the Management and Removal of Asbestos (Revised) 1999;
- Any material requiring offsite disposal must be disposed of at facilities consented to accept contaminated material;
- Maintain a register of any contaminated material discovered, including location, type, quantity and disposal record (landfill receipts and waste manifest).

CEMP Expectations for the appointed Principal Contractor

A GCS Soil Contamination Discovery Plan should be developed once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager.

2.3.12 Materials and waste management

Potential Impacts

The NZTA has policies around reducing waste to the greatest extent as efficient use of resources is both environmentally and financially beneficial. In addition inefficient use of raw materials, leaks from liquid stores, ground and controlled water contamination from materials stores, contamination from spills while handling wastes, litter blow, associated presence of pests (flies, rodents and birds), and propagating non-native invasive species are also significant issues to be managed

Project-Specific Issues and Requirements

A GCS has been developed concerning waste management that sets out an approach to manage waste production and disposal within the Project area from any construction activities undertaken. The procedure also includes an approach to minimise introduction of waste to the environment within and surrounding the Project area.

CEMP Expectations for the appointed Principal Contractor

Once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager a GCS on waste management should be developed and implemented.

2.3.13 Utilities

Potential Impacts

The Project directly affects a number of network utilities, including electricity transmission and distribution lines, telecommunications, water supply, wastewater and stormwater disposal utilities, stock water races and also the rail network. Ensuring that disruptions to service supply are kept to a minimum are critical as any outage or loss of levels of service can have a direct impact upon public health, safety or user convenience.

Project-Specific Issues and Requirements

NZTA has consulted with network utility operators to identify network utilities that will be directly affected and how they can be protected and /or how relocation can be appropriately undertaken. The outcomes of these initial discussions concluded that all adverse effects on network utilities directly affected by the Project will be able to be appropriately avoided, remedied or mitigated.

Enabling works will be required prior to construction, in particular rectifying the clearance violation under the existing electricity transmission lines and the relocation of electricity distribution lines. Construction activities may impact on existing network utilities as a result of dust affecting electricity and rail infrastructure operations and sediment entering stock water races. These effects will need to be mitigated through the processes in the CEMP or in SEMPS relating in particular to dust (SEMP 001) or Erosion and Sediment Control SEMP 002).

Protection and/or relocation of existing utilities will occur in conjunction with the Project's construction and be appropriately planned for during detailed design. The appointed contractor will need to work closely with the relevant network utilities owner's contractor to undertake the necessary protection and/or relocation works to ensure effects on these networks are avoided or mitigated.

CEMP Expectations for the appointed Principal Contractor

Once a detailed construction programme and build methodology has been agreed with the NZTA by the Principal Contractor and the Construction Environmental Manager a GCS on utilities management and allied communication processes should be developed and implemented.

2.3.14 Archaeology and Artefacts

Potential Impacts

There are no recorded archaeological sites within the Project area although there is potential that finds may be accidentally encountered. Without due care, destruction or damage to finds may result.

Project-Specific Issues and Requirements

Consent conditions proposed record a process if burials, taonga or other finds are encountered. Specifically an Accidental Discovery Protocol covering NZTA New Zealand Regions 11 (Canterbury) and 12 (West Coast) is in place to manage any such occurrences while NZTA have also adopted the Ngai Tahu Koiwi Tangata Policy 1993 relating to unknown burials. This is attached as Appendix J. The contractor should ensure that the NZTAs Policy and the Ngai Tahu Koiwi Tangata Policy 1993 is followed

CEMP Expectations for the appointed Principal Contractor

The guidance and expectations set out in the Accidental Discovery Protocol (Appendix J) covering NZTA New Zealand Regions 11 (Canterbury) and 12 (West Coast) Ngai Tahu Koiwi Tangata Policy 1993 relating to unknown burials should be followed.

2.4 Legislative and other requirements

The legislative requirements in relation to the CEMP need to be identified in order for them to be managed. The legislative requirements to consider, but not limited to are:

- Resource consents and associated conditions;
- Designations and associated conditions;
- Department of Conservation concessions;
- Historic Places Trust archaeological authorities;
- Building consents;
- Permitted activities in the regional/district plans;
- Regional strategies e.g. Pest Management Strategies; and

- Wildlife Act 1953 permits.

2.4.1 Project Approval Process

The NZTA is seeking all necessary Resource Management Act approvals to construct, operate and maintain the State Highway and local road works required for the Project. This includes Notices of Requirement for new and altered designations within the Christchurch City and Selwyn District Plans. The Notice of Requirement applications also incorporate sufficient detail to satisfy Outline Plan requirements, in accordance with Section 176A(2)(b) of the RMA. Furthermore, all regional resource consents for the construction and operation of the road and associated drainage infrastructure are being sought.

2.4.2 National Legal Requirements and Policies

As outlined in the NZTA Environmental Plan 2008, the Land Transport Management Act 2003 (LTMA), New Zealand Transport Strategy (NZTS) and Resource Management Act 1991 (RMA) are the primary enabling legislation for environmental management of NZTA activities. These mandate sustainable management with the expectation that the NZTA “exhibits a sense of social and environmental responsibility” in meeting the statutory objective of operating a state highway network that contributes to an integrated, safe, responsive and sustainable land transport system. Other relevant legislation, regulations and standards, which have either direct or indirect bearing on the CEMP include:

- Conservation Act 1987;
- Energy Efficiency & Conservation Act 2000;
- Historic Places Act 1993;
- Local Government Act 2002;
- Government Roadway Powers Act 1989;
- Public Works Act 1981;
- Reserves Act 1977;
- 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;
- Wildlife Act 1953;
- National Environmental Standard – Air Quality 2004;
- National Environmental Standard for assessing and managing contaminants in soil to protect human health 2011; and
- National Policy Statement for freshwater management 2011.

2.4.3 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 that CS-VUE™ is used to track and record the compliance of the following legal obligations;

- 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 and condition of (or other legal obligation) with a consent manager and condition manager and automatically sends an email notifying them of compliance requirements. The consent manager is the NZTA project manager who is responsible for overseeing consent compliance management, and the condition manager is the project MSQA consultant who is responsible for ensuring day-to-day compliance.

Evidence to demonstrate compliance is entered in CS-VUE™ with all entries/changes annotated with the person's name and date who undertook the changes. Post-construction, the responsibility of any conditions which have on-going maintenance and operational requirements will be transferred to the NZTA Asset Manager.

2.5 Environmental Risk Register

An Environmental Risk Register shall be prepared and should be periodically updated by the appointed Principal Contractor and Construction Environmental Manager. As a starting point for the Risk Register the AEE development process and the conditions attached to consents and approvals shall be utilised. The Risk Register shall set out the risks and links to the appropriate section of a GCS or SEMP, which stipulate the required mitigation should it be required.

The Environmental Risk Register, to be populated and maintained by the Principal Contractor, is a tool for the identification, prioritisation and management of activities that have the potential to impact on the environment. As part of this update process the Principal Contractor is expected to use a recognised Risk Assessment methodology for consensus agreement with the NZTA. The risk assessment process shall define a process of identifying significant risks. These risks are then entered into the Risk Register.

The Environmental Risk Register will allow the Principal 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.

The Construction Environmental Manager will also be required to maintain the Environmental Risk Register. The risk assessment results will need to be reviewed at regular intervals and repeated at critical times within the Project. Triggers for this review and update include:

- NZTA instruction;
- Before commencement of construction (once detailed programme and methodologies are understood);
- When there is a new or changed activity, equipment or location of activities;
- When there is a change to legislative or consent and designation requirements; and
- As a result of a significant environmental incident or non-compliance.

The Register will be reviewed and updated on a quarterly basis in the event that none of the preceding activities have already triggered a review.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall develop, implement and maintain the environmental risk register throughout the duration of the CSM2 construction phase. A risk assessment procedure is required to be submitted to NZTA to demonstrate that risks are being identified throughout the construction phase.

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3. Part C – Implementation and Operation

This section of the CEMP addresses the implementation and operation of the CEMP and the SEMP.

3.1 CEMP Management Structure and Responsibility

The following areas are covered in this section:

- CEMP Management Structure and Responsibility;
- Training;
- Operating Procedures inclusive of mitigation measures;
- Emergency Contacts and Response; and
- Feedback Management.

3.1.1 CEMP Roles

Table 3 outlines expected environmental anticipated management roles on site. Each contractor will likely have its own management structure and will need to provide a description of roles and responsibilities to NZTA upon contract award.

Table 3 Management roles and responsibilities

Position	Name	Company	Responsibility
NZTA Project Manager	TBC	NZTA or delegate	<ul style="list-style-type: none"> • Overall responsibility for the project
Engineer to the Contract	TBC	Consultant	<ul style="list-style-type: none"> • Overall responsibility for civil engineering/ construction activities • Responsibility for implementation of the CEMP • Administration of the contract to NZS 3910
Principal Contractor Project Manager	TBC	TBC	<ul style="list-style-type: none"> • Contractor representative with overall responsibility for the Project • Compliance and updating of the CEMP • Successful delivery of the Project

Position	Name	Company	Responsibility
Resident Engineer	TBC	TBC	<ul style="list-style-type: none"> • Support the Project Manager • Successful delivery of the Project
Construction Environmental Manager (CEM) (or equivalent)	TBC	Contractor	<ul style="list-style-type: none"> • Environmental induction and training of personnel including subcontractors and visitors • Responding to incidents and providing feedback to interested or affected parties. • Environmental Reporting • Maintaining CEMP • Compliance with CEMP, aspect management plans and consent conditions • Liaison with Regional and District Councils and other regulatory authorities

CEMP Expectations for the appointed Principal Contractor

Table 3 should be reviewed and completed upon appointment of the Principal contractor. An organisational chart should also be included in this CEMP by the Construction Environmental Manager. This organisation chart should show the relationships and connections for the positions identified in Table 3.

The defined roles and responsibilities and the chart do not remove or overwrite the legal duties, responsibilities and obligations of the Principal Contractor in accordance with the contract documents and legislation.

3.2 Training

The Policy and Objectives of this CEMP will only be met successfully when all those responsible for its implementation and review are thoroughly conversant with its content, interpretation and performance measurement. The NZTA is committed to providing training for its site workforce and putting in place contractual arrangements with the Principal Contractor that stipulate the need for adequate training to be provided to all contracted members of the workforce.

Staff involved in environmental monitoring required by any resource consent conditions and by the requirements identified within this CEMP will be trained and competent in the operation, calibration and maintenance of the equipment. Sampling staff will also be trained and competent in sample collection, handling, storage and transport methodologies and techniques. Records of staff training will be auditable and available for inspection, on request.

3.2.1 CEMP Training

All Project employees and subcontractors are to be inducted and given appropriate environmental awareness training. The training is to be relevant to their different roles to ensure that they are aware of:

- The importance of conformance with the environmental policy and procedures and with the requirements of this CEMP;
- The actual and potential environmental impacts of their work activities and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and this CEMP; and
- The potential consequences of departure from specified operating procedures.

The Project specific site environmental induction will include an overview of resource consent conditions, designation conditions, permitted activity standards, environmental control procedures and the SEMP. Specific individuals with environmental responsibilities may require the following training:

- Emergency response training;
- Spill kit training;
- Environmental auditing; and
- Sampling and Monitoring.

All environmental training records are to be held at the Project Construction Office. The Construction Environmental Manager will have responsibility for maintaining and updating these records.

As a requirement of each training session a record should be completed with the date of the training exercise, a description of the training content, the name of the trainer and trainee(s), and the signature of the trainer and relevant manager. See Appendix M for an example training schedule that can be used. Conversely, the Principal Contractor may use its own format if available.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall develop, implement and maintain training systems that meet the requirements of this CEMP. These training systems shall be discussed and if so required submitted to the NZTA for review and agreement prior to construction start.

In particular the Principal Contractor shall submit to the NZTA prior to the commencement of operations, a procedure for Environmental Training and Awareness, which identifies and addresses all training requirements. The training should address the specific requirements of this CEMP and the identified environmental risks as set out in the risk register. Environmental performance relies

to a great extent on the general awareness of environmental issues of all personnel involved in the project. Training and awareness tools and indicators could include, but not be restricted to:

- Professional or trade qualifications;
- Experience;
- On the job training;
- Training and Awareness literature e.g. posters and leaflets.
- Formal skill training;
- Inductions;
- Tool box talks; and

3.3 Operating Procedures

This CEMP contains a series of instructions and expectations that need to be followed in order to successfully satisfy the Policy and objectives of this CEMP.

The instructions given within this CEMP control situations where the absence could lead to a deviation away from environmental legal requirements, NZTA objectives and relevant policies, plans, standards, specifications and guidelines that this CEMP abides by.

The NZTA has a series of Standard Operating Procedures (SOP) that all contractors have to abide by. These will be provided to the Principal Contractor upon award of the contract and includes those identified in the Social and Environmental Assessment section of the PSF13. This includes *Minimum Standard Z/22 Accidental Discovery Procedures*.

CEMP Expectations for the appointed Principal Contractor

Operating procedures need to be established and documented to control situations where the absence could lead to a deviation away from the NZTA Environmental & Social responsibility Policy, Environmental Objectives and/or Legislative Requirements.

It is expected that the Principal Contractor should develop and implement a series of Standard Operating Procedures (SOP) in order to facilitated CEMP adoption and implementation prior to construction start. These SOP shall be agreed upon with the NZTA.

3.4 Emergency Contacts and Response

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

3.4.1 Incident/Emergency 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 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:

- Unforeseen impact on areas of high environmental value such as protected flora or fauna, archaeology;
- Environment Canterbury non-compliances (for example relating to erosion and sediment control);
- Significant (large volume) chemical / oil spill to a waterway or land;
- Hazardous substance release to air; and
- Other consent or designation non-compliances.

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 or a failure to follow the established process or procedures that help the Contractor achieve best practice. Table 4 below outlines key contacts in case of an environmental emergency.

Table 4 Environmental Emergency Contacts

Name	Role	Contact phone number	Contact email
TBC	Construction Environmental Manager		
TBC	Superintendent		
TBC	Principal Contractor Project Manager		
TBC	Project Manager		
TBC	Other relevant personnel as appropriate.		
New Zealand Fire Service/Police		111	
Environment Canterbury		0800 324 636 (0800 EC INFO)	
24 Hour pollution hotline		0800 76 55 88 or (03) 366-4663	
Selwyn District Council contact	TBC		

Name	Role	Contact phone number	Contact email
Christchurch City Council contact	TBC		
Spill equipment stockist	TBC		

The Construction Environmental Manager should devise the emergency response procedures for the approval of the NZTA Project Manager.

3.4.2 Environmental Incident reporting

Where there is an environmental incident an Environmental Non Compliance Report (ENCR) should be completed by the Principal Contractor (or representative) and submitted for review to the NZTA by the CEM. An indicative ENCR is attached for use in Appendix K, but the Principal Contractor may use any similar incident reporting form.

All environmental incidents occurring at the site during the project will be added to an Environmental Incident Register (EIR). The Construction Environmental Manager will be responsible for ensuring all data from completed ENCRs are included in the EIR as soon as practicable.

Discussion of the EIR will be an agenda item for all Project Management Team meetings. These meetings will review incidents that have occurred, suitability of response and preventative measures that have been put in place, as well as any patterns that may emerge over time and how these should be managed to avoid future incidents.

3.4.3 Location and Use of Emergency Management Equipment

Emergency response and management equipment shall be made available at all times during construction activities. All site staff and subcontractors shall be made aware of the location of this equipment as part of the induction process and as part of refresher toolbox talks (when deemed appropriate by the CEM or after an incident has occurred).

A site plan showing the location of spill kits and other emergency management equipment within the site compounds and at intervals along the route shall be prepared.

All staff and subcontractors shall be trained and made aware of their responsibilities in emergency response situations. The training shall include, but not be limited to, education regarding the environmental consequences of emergency situations and in the use of equipment and in the procedures of the CEMP.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall develop and implement an emergency response plan prior to construction start. This emergency response plan should detail

- How to raise the alarm, and to assess and respond to possible pollution incidents through immediate environmental damage limitation action following the “source–pathway–receptor” model (reduce/eliminate the source of contamination– prevent the contaminant moving through the pathway and protect receptor);*
- Identifying and nominating personnel with suitable training, knowledge and experience, for an emergency response team, and determining their responsibilities and lines of communication;*
- Notification of and liaison with external parties such as emergency services, statutory consultees/undertakers, local authorities and local community;*
- Location plan of emergency response equipment;*
- Arrangements for rehearsal;*
- Training of staff in emergency response and the use of emergency response equipment; and*
- A system to identify and document training and awareness needs and attendance.*

The plan should be agreed upon with the NZTA prior to construction start.

4. Part D – Monitoring and Review

In order to ensure that legal requirements, NZTA objectives and relevant policies, standards and guidelines are being complied with, on-going evaluation of environmental performance is required. Monitoring will be undertaken to check that the activity specific controls have been implemented and to identify any potential or actual problems and rectify them.

Environmental monitoring will include both scheduled (regular) monitoring and triggered (response) monitoring. As the focus of this CEMP is to anticipate and prevent adverse environmental effects associated with the construction works, monitoring is crucial. The main focus of this monitoring will be field checks of the environmental controls or measures to reduce the risk of failure and thereby any adverse environmental impacts.

4.1 Compliance Monitoring

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

Environmental monitoring will take place:

- Prior to construction to establish 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 SEMP's and required by consent conditions. The overall monitoring schedule, including environmental aspects (i.e. noise, water quality, air quality etc), frequency and monitoring requirements should be updated by the Principal Contractor. The monitoring schedule is intended as 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:

- The CEM is responsible for managing the environmental monitoring programmes relevant to the 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 relevant authorities;
- 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;
- The CEM will advise the Project Manager of any noncompliance found during monitoring and will report these to relevant authorities as required;

- Where required by consent conditions, environmental monitoring results will be inputted by the Project Consultant to NZTA's CS-VUE database for the project. This will be overviewed on a regular basis by the Contractor's Project Manager; and
- Environmental monitoring results will be reported to the relevant authorities as required.

Should inspections indicate that the environmental controls are not functioning as intended, the Construction Environmental Manager and Principal Contractors Project Manager or Engineer will instigate a review of the CEMP or relevant aspect environmental management plans as required. Specific response targets will be developed by the Construction Environmental Manager prior to construction commencing.

As part of the commitment to CEMP environmental performance evaluation, Environmental Compliance with all applicable legislation forms part of the CEMP audit process. Routine compliance audits are provisioned in order to assess on-going performance and compliance.

4.1.1 General Site Monitoring

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

- Daily – Environmental team 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;
- Daily – checking of weather forecast and on-site weather conditions and any pre and post storm inspections as required;
- Inspections as required by environmental control procedures e.g. sediment control devices inspected daily to ensure that they are installed correctly, operating effectively and are properly maintained;
- Weekly – Formal site inspections are to be completed by the Construction Environmental Manager. 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); and
- Monthly – The NZTA's Project Manager, and CEM will undertake a monthly site inspection, to confirm the environmental monitoring programmes and work procedures containing environmental controls are being implemented in accordance with the CEMP, Operational Work Programme and resource consent and designation conditions.

Triggered inspections will be undertaken in response to the following:

- Feedback – upon receiving feedback on any issue, an inspection of the area affected or involved will be undertaken;
- Extreme weather – site control measures will be inspected immediately before, during and after extreme weather for any non-compliance with resource consent conditions; and
- Non-compliance – inspections will be undertaken immediately following spills or other incidents or emergencies and after "near miss" events.

The findings of these triggered inspections need to be recorded. The CEM will submit a site inspection and environmental performance report to the Contractor's Project Manager at the

monthly management meeting. The Principal Contractor Project Manager will report to the NZTA Project Manager. 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, feedback received, incidents, associated investigations and corrective actions, and environmental inductions and awareness training provided.

Sampling protocols, equipment and calibration

As part of the sampling and monitoring requirements there is a need for the use of sampling equipment to obtain compliance and surveillance data; regardless who performs these task (specialist subcontractor/consultant or Principal contractor staff). The CEM shall make sure that staff are appropriately qualified and trained and the equipment is appropriate for the task and calibrated.

Table 5 sets out requirements for the maintenance and use of sampling equipment that could be used for the collection of compliance data i.e. Noise, pH Probe etc.

Table 5 Equipment Calibration and Maintenance

Tasks	Monitoring	Performance Criteria	Corrective Action
Calibrate and maintain equipment used in environmental monitoring	Construction Environmental Manager to inspect records to establish regular maintenance and calibration programme	<ul style="list-style-type: none"> Calibration and maintenance records 	Prohibit use faulty or un-calibrated equipment
Sampling, calibration and maintenance undertaken by Competent person	Construction Environmental Manager to inspect training records to establish staff competence	<ul style="list-style-type: none"> Observation of calibration and maintenance procedures to supplier/ manufacturers guidelines Laboratory sample control documents 	Provision of adequate training/ instruction

4.1.2 Monitoring Data Review

The CEM and Principal Contractor Project 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 NZTA Project Manager, Principal Contractor Project Manager and the CEM to discuss the results of the weekly and monthly site monitoring.

On a monthly basis the Construction Environmental Manager will review the monitoring schedule and compliance results from the required Environmental Monitoring as per the resource consent and designation conditions. The policy, objectives and procedures described in this plan will be regularly reviewed for effectiveness and revised accordingly.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement, a compliance and general monitoring procedure that meets the requirements of this CEMP.

The procedure should set out as a minimum

- Responsibilities;
- Competency required;
- Frequency;
- Data analysis techniques;
- Duration; and
- Reporting formats

4.2 Reporting

Table 6 below outlines the reporting requirements as detailed within the CEMP. This will be reviewed and refined following the appointment of a Contractor and it may be possible to combine reporting requirements with the agreement of the NZTA project manager.

Table 6 CEMP 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	CEM	The Construction Project Manager, NZTA, Environment Canterbury/Christchurch City Council/Selwyn District Council
Feedback Form	Obtain respondents details	At the time of the feedback	CEM	Feedback Register
Environmental Feedback Register	Information provided on Environmental Feedback Form	At feedback closure	CEM	Project Manager Construction Project Manager NZTA Project Manager

Report	Reporting Requirements	Timing	Responsibility	Recipient
Non-Compliance Report	Identification of non-complying activity which has resulted in environmental feedback or an incident onsite	During feedback investigation	CEM	Project Manager
Construction Compliance Report	Summary of feedback received and resolutions	Quarterly	CEM	The Project Manager and the relevant authority or authorities.
General Site Monitoring Report	Summary of site inspections, including daily, weekly and monthly inspections – consent and designation and CEMP compliance	Monthly	CEM	Principal Contractor Project Manager
Environmental Formal Site Inspection	Weekly site inspection sheets	Weekly	Environmental Management Team	CEM
Environmental Incident Reports	Obtain the incident details	At the time of the incident	On site personnel involved in the incident	CEM
Incident Response Reports	Obtain incident information	At the completion of the Incident situation	CEM and on site personnel involved in the environmental emergency	Principal Contractor Project Manager, Project Manager and Environment Canterbury/Christchurch City Council/Selwyn District Council – where appropriate and required under legislation

Report	Reporting Requirements	Timing	Responsibility	Recipient
Environmental Audits	Summary of quarterly environmental audit findings	Quarterly, within two weeks of audit completion	CEM	NZTA Project Manager and Construction Project Manager
Site Audits	Summary of informal audit findings	Monthly, within two weeks of audit completion	CEM	Construction Project Manager and on site personnel.

A monthly report shall be produced that provides a summary of information pertaining to the following:

- Permits and any resource consent approvals granted during the month;
- Results of environmental monitoring (inspections and audits) conducted during the month; and
- Any environmental non-conformances: incidents, emergencies, negative feedback, near misses etc.

This report shall be prepared by the CEM or delegate and tabled at Project Management Team meetings. The report should coincide with the CEMP Audit programme; whereby audit observations and findings can be included in a timely manner for discussion at the next monthly meeting.

Any resource consent conditions that require data and information reporting to Environment Canterbury and/or Selwyn District/ Christchurch City Council will be identified and provision made for submission by the Principal Contractor and the Construction Environmental Manager.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement a reporting schedule that meets the requirements of this CEMP.

4.3 Documents and Records

4.3.1 Principal Contractor Documentation

The Principal Contractor will undertake the construction of the works in accordance with the contract documents, legislation and the CEMP. As a minimum the Principal Contractor should demonstrate to the NZTA that documentation systems should cover the base requirements of the CEMP and is fully tried and tested.

Documents relating to the CEMP, their issue, revision, storage and archiving will be in accordance with the requirements of the Quality Management System (QMS) and Environmental Management Systems implemented by the Principal Contractor. A schedule of *Environmental Records* will be maintained by the Construction Environmental Manager.

The environmental records will include amongst others, monitoring results, results of any watching briefs and surveys and pollution incidents in accordance with the contract. A separate record of any feedback or comments will be maintained, together with any actions taken and responses given.

Site induction and staff training records will also be kept in a separate filing system, which will be regularly checked by the site Construction Environmental Manager, as this will help show that all staff are trained at sufficient intervals for their area of work.

The records will be archived as required by the requirements of the QMS and Environmental Management Systems implemented by the Principal Contractor.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement procedures for Document and Record management and control, that sets out as a minimum

- Retention times;*
- Types of records;*
- Responsibilities;*
- Formats;*
- Circulation and issue control; and*
- Revision and updates.*

This can be as part of a documented QMS.

4.4 CEMP audits

Environmental audits are a means of obtaining information about environmental performance and compliance with the objectives and targets of the CEMP. They also help to signpost any areas of concern or where corrective action may be required in order to reduce the potential for any adverse environmental impacts.

Performance of the CEMP will be reported back to the NZTA Project Manager and Engineer by the Principal Contractor and the CEM. Performance will be assessed in terms of the delivery of the objectives. The objectives of the CEMP are the benchmarks of performance and will be subject to ongoing monitoring.

The Principal Contractor and CEM shall devise an audit schedule in accordance with the finalised construction programme in order to assess the overall performance on site in a timely and appropriate manner.

The CEM and the Principal Contractor shall audit the construction site on a regular basis as deemed appropriate by the CEM, by utilising an audit checklist to be provided by the Principal Contractor.

At any time the Project Engineer may accompany the audit. It is also foreseeable that Environment Canterbury and or CCC, or SDC inspectors will attend from time to time.

Audit checklists should be updated and refined by the CEM and the Principal Contractor regularly to consider the changing nature of the construction programme and inputs from corrective actions logs originating from non-conformance reports.

Audits will be conducted during the course of the construction works by various people and with regular frequencies. Table 7 below provides proposed environmental auditing frequency and outlines who will undertake the audits.

Table 7 Environmental Audits Schedule

Type of Audit	Responsibility	Purpose	Frequency
Internal audit	CEM or delegate	Assess effectiveness of controls and compliance with environmental procedures. This may be combined with internal site safety inspections if appropriate.	Fortnightly
Quarterly audit	External environmental personnel TBC	Identify issues or other matters that may not be noticed by personnel who are working on the project on a day-to-day basis.	Quarterly
External audit	Regulatory authorities	Confirming compliance with consent conditions	As required

Discussion of environmental audits will be an agenda item for all Project Management Team meetings. These meetings will review audits that have occurred, and any measures that may be required to improve conformance with the CEMP, as well as any updates to the CEMP that may be needed.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement an auditing procedure and schedule that meets the requirements of this CEMP.

4.5 Corrective Action

Corrective actions are required when a non-conformity is identified. Corrective actions are needed for any problem, such as legal non-compliances, to devise and initiate appropriate controls in order to prevent a reoccurrence. The need for corrective action may be identified under the following circumstances:

- When inspecting environmental protection measures on site and identifying that they have not been correctly installed or maintained;
- When site inspections or audits are undertaken;
- When negative environmental feedback is investigated;
- After analysing what happened in an incident, emergency or near miss; or
- From checking or reviewing the CEMP.

Preventative action is part of the corrective action process and involves identifying any potential problems before they occur and to minimise the potential to reoccur.

4.5.1 Environmental Non Compliance and Corrective Actions

If a non-conformance is discovered during an audit or otherwise reported an Environmental Non Conformance Report Form (ENCR) (see Appendix K for an example ENCR that can be used, conversely the Principal Contractor can use their own format if available) shall be completed and corrective actions shall be devised. The recommended corrective actions will be recorded in the Corrective Actions Log (an example Corrective Action Log is found in Appendix L, conversely the Principal Contractor can use its own format if available).

Substandard performance will be measured by resulting actions i.e. negative feedback, 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:

- Eliminate; or
- Isolate; or
- Minimise; or
- Improve; or
- Remove; or any combination of the above.

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. On-site personnel are responsible for the identification and reporting of non-compliance's, and the usage of NCRs.

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

The CEM is responsible for handling and investigating any non-compliance. Any action required will then be directed to the relevant personnel for action and a time frame given for completion. Upon completion of the corrective action, the relevant personnel shall notify the Environmental Manager of the action taken, at which time the CEM will update the NCR and close it out if appropriate.

Progress of any corrective actions will be recorded in the NCRs. This information will be monitored and reported to the NZTA or their delegate in conjunction with the schedule of site inspections. Audit records will be maintained in accordance with the expectations of this CEMP.

Corrective actions should be ranked commensurate to the risk. On occasions where legal compliance is an issue or environmental pollution is imminent, then the corrective actions should be implemented as soon as possible.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement a procedure that details the approach toward identifying environmental non-conformances and the development, implementation and validation of corrective action, this can be as part of a QMS.

4.5.2 Communications

Communications Internal and External

An important procedure for any project is the communication procedure. A Communications Plan is required to be prepared and a designated public liaison person who will be the main and readily accessible point of contact at all times for persons or parties affected by construction work should be appointed.

The internal component of the Communications Plan shall state how the NZTA and the Principal Contractor will communicate on matters relating to the CEMP. This will include a section in the Principal Contractor's Monthly Report on the implementation of the CEMP covering;

- Inspection and measurement done;
- Any non-compliance;
- Any corrective/preventative action required, by when and who will do it;
- Opportunities pursued for social and environmental enhancements; and
- Successful innovations that may contribute to best practice.

As part of the external Communications Plan a procedure is required for receiving, documenting, notifying and responding to relevant external parties and the community. This could include;

- 24-hour project construction response number or maintenance hotline;
- Project website;
- Letterbox drops;
- Public events;
- Media releases or other advertising activities; and
- Methods for responding to feedback received.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement a communication procedure that meets the requirements of this CEMP. This should be done in conjunction with any Stakeholder Management and Communication plan (or equivalent) that may be prepared for the project.

4.6 Feedback Management

When environmental feedback (complaints, comments or compliments) is received, it will be actioned as necessary by the Construction Environmental Manager. The Construction Environmental Manager will then complete the following forms:

Feedback Form

A standard Feedback Form template will be used for all site specific activities throughout the Project.

The Construction Environmental Manager will ensure that the details of the investigations and any follow up actions are completed and recorded for each feedback response. The form will contain but not be limited to;

- Name and address of respondent
- Identification of the nature of the feedback
- Date and time of the feedback and alleged event

An example of the Feedback Form is included in Appendix J. The CEM will commence an inquiry as soon as practicable from receiving adverse feedback.

Contact will be made with the respondent within the same working day – an interim response advising that investigations are continuing is acceptable. A formal written response will be provided to the respondent and appropriate regulatory authorities (e.g. Environment Canterbury, Historic Places Trust (HPT) Selwyn District Council and/or Christchurch City Council) within 10 days of adverse feedback receipt.

Feedback Register

A Feedback Register (FR) will be controlled by the Environment Manager. It will contain all feedback (both positive and negative), received for the Project. The CEM will input all data from completed environmental incidents forms as soon as possible.

The CEM will summarise all feedback received throughout the site to on-site staff members during weekly Tool Box sessions.

The Feedback register shall also be discussed at regular meetings held between the Environmental Manager, Principal Contractor Project Manager and the Project Manager.

CEMP Expectations for the appointed Principal Contractor

The appointed Principal Contractor can use the templates and process contained within this CEMP or should submit to the NZTA for prior evaluation and agreement a procedure for the capture, documentation, investigation and resolution of feedback particularly adverse feedback.

4.7 CEMP Management Review

The CEMP 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 SEMP's 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 physical environment.

Approval from the Environment Canterbury, Selwyn District Council and Christchurch City Council will be required for any relevant revisions of a material nature to the CEMP or SEMP, 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 Principal Contractor Project Manager. The management review will be organised by the CEM. The review will take into consideration:

- Input from the NZTA;
- Site personnel comments;
- Audit findings and recommendations;
- Environmental monitoring records;
- Environmental feedback, incidents and emergencies;
- Details of corrective and preventative actions;
- Environmental non-compliances;
- Changes to organisational structure;
- On-going 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 superseded. Each new/updated version of the CEMP documentation will be issued with a version number and date to eliminate superseded CEMP documentation being used.

The on-going effectiveness of the arrangements made in this CEMP will be monitored and reviewed through the audit and monitoring process and during all meetings that occur as part of the Project management process.

4.7.1 Final CEMP close-out report

The Construction Environmental Manager will be responsible for the preparation and drafting of a close out report that details CEMP performance over the construction phase, sets out issues that any relevant Operational Environmental Management Plan needs to consider or will inherit, and sets out recommendations and observations regarding overall performance and effectiveness of the CEMP.

The closeout report will be reviewed by the NZTA Project Engineer, Design Team and NZTA delegates. The NZTA Network Maintenance Manager who will take over the asset should also be provided a copy for comment.

The final close out report will be signed off by the NZTA Project Manager and Principal Contractor, all records and reports relating to the CEMP plus the close out report will be compiled by the CEM into a single final CEMP document. Copies of this final document will be circulated as required and at the discretion of the NZTA Project Manager. This report should be timed to coincide with the transition phase.

CEMP Expectations for the appointed Principal Contractor

The Principal Contractor shall submit to the NZTA for agreement a review and reporting schedule that meets the requirements of the contract, any consent conditions and this CEMP.

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