

Northern Corridor Improvements

Draft Contaminated Site Management Plan

Project No: 250310
Document Ref:
NCI-3PRE-2ENV-RPT-0158
Revision: 2

9 December 2016



 NZTRANSPORT
AGENCY
WAKA KOTA-HI

 aurecon

 KensingtonSwan
LAWYERS



This report has been prepared for the benefit of the NZ Transport Agency (NZ Transport Agency). No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

Quality Assurance Statement	
Prepared by:	Gareth Beck (Aurecon)
Reviewed by:	Timothy Dee (Aurecon)
NZTA Reviewer:	Greg Haldene
Approved for issue by Aurecon:	Jon Hind
Approved for use by NZTA:	Kenny See



Contents

1	Introduction	1
1.1	Project Background	1
1.2	Purpose of this CSMP	2
1.3	Approach	3
1.4	Receiving Environment	3
1.5	Potentially contaminating activities	4
2	Roles and Responsibilities	5
2.1	Introduction	5
2.2	The Client	5
2.3	Principal Consultant	5
2.4	Environmental Consultant (Suitably Qualified Environmental Practitioner)	5
2.5	Principal Contractor	6
2.6	Site Manager	6
2.7	Remediation Contractor	6
2.8	Remediation Manager	6
2.9	All Employees	7
3	Outline Remedial Plan	8
3.1	Introduction	8
3.2	Remediation Action Plan	8
3.3	Remediation Targets	9
3.4	Preliminary Works	9
3.5	Validation	10
4	Contaminated Soil and Water Management	13
4.1	Introduction	13
4.2	Contaminated soil definition	13
4.3	Soil Management	14
4.4	Groundwater Management	15
4.5	Dust and Odour Control	16
4.6	Stockpile Construction and Management	16
4.7	Earthworks documentation	17
4.8	Spill Response – Hazardous Materials	17
4.9	Emergency Response	17
4.10	Unexpected Contamination Discovery Protocol	18
4.11	Complaints	19
5	Asbestos removal and management protocols	20
5.1	Overview	20



5.2	Additional Health and Safety and Legislative Requirements	20
5.3	Offsite Disposal	23
5.4	Encapsulation	24
6	Limitations	25

Appendices

Appendix A

Drawings

Figures

Figure 1	Extent of Project Area	1
----------	------------------------	---



Glossary of Abbreviations

Item	Description
ACM	Asbestos Containing Material
CLMG	Contaminated Land Management Guideline
CSMP	Contaminated Site Management Plan
DSI	Detailed Site Investigation
HAIL	Hazardous Activity and Industry List
HDPE	High Density Polyethylene
IANZ	International Accreditation New Zealand
IGNS	Institute of Geological and Nuclear Sciences
MfE	Ministry for the Environment
NES _{Soil}	MfE, 2011, Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, SR 2011/361, October
NOHSC:2002 (2005)	National Occupational Health and Safety Commission Code of Practice for the Safe Removal of Asbestos (2 nd Edition, 2005)
PCBU	Person Conducting a Business or Undertaking
PID	Photo Ionisation Detector
PPE	Personal Protective Equipment
PSI	Preliminary Site Investigation
RAP	Remedial Action Plan
RMA	Resource Management Act 1991
RWWT	Rosedale Waste Water Treatment
SH1	State Highway 1
SH18	State Highway 18
SQEP	Suitably Qualified and Experienced Practitioner of contaminated land services
SVR	Site Validation Report
UHH	Upper Harbour Highway
WA DOH (2009) guidelines	Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (Western Australia, Department of Health, 2009)



Terms and Definitions

Item	Description
Aurecon	Aurecon New Zealand Ltd
Contamination	The presence of a substance at concentrations in excess of background. Note this is distinct from the definition of 'Contaminated Land' under the RMA.
NZ Transport Agency	New Zealand Transport Agency
Project	Refers to the Northern Corridor Improvements Project including the extension to the Northern Busway and proposed Shared Use Pathway.
Project area	The area within the proposed designation(s) corridor for the Northern Corridor Improvements Project and that area abutting this corridor
Project corridor	The area in which the Project is located



1 Introduction

1.1 Project Background

The Northern Corridor Improvements Project (the Project) is an accelerated project. The Project area covers the area of SH18 between Albany Highway and Constellation Drive, and SH1 between Upper Harbour Highway (UHH) interchange to just beyond the Oteha Valley Road Interchange as indicated on **Figure 1** below and confirmed in the suite of plans provided in **Volume 5**.

Figure 1 Extent of Project Area



Source: Base Map from LINZ

The Project proposes to upgrade the existing State highways within the Project area. In summary, the key elements of the Project are as follows:

- North and West Motorway Interchange connections – SH1/SH18;
- State highway capacity and safety improvements;
- Northern busway extension from Constellation Bus Station and connection to Albany Bus Station;
- Reconfiguration of Constellation Bus Station converting it from a terminus station to a dual direction station;



- Shared Use Path (SUP) provision along existing SH1 and SH18 routes for the full extent of the Project corridor;
 - Constellation Station to Oteha Valley Road;
 - Constellation Drive to Albany Highway; and
 - Intermediate linkages to the local network.

A full description of the Project, including its components and construction, is contained in Chapter 5 of the Assessment of Environmental Effects (AEE).

The project footprint is referenced by chainage (CH).

Soil investigations (Detailed Site Investigation) have yet to be undertaken along the Project corridor. It is recommended within the Preliminary Site Investigation (PSI) that further investigation works are undertaken to characterise contamination potential associated with identified Hazardous Activities and Industries List (HAIL) sites identified along the Project corridor that have the potential to affect human health and impact the environment. If the design of the alignment changes significantly a further review of the HAIL should be undertaken.

The principal purpose of the CSMP is to demonstrate that contaminated soils can be appropriately managed and provide a description of the minimum standards that must be complied with if contaminated soils (and groundwater if required) are encountered during the course of earthworks along the Project corridor.

In addition to the management of contaminated soil and groundwater along the Project corridor, a general methodology for the management of asbestos containing material (ACM) in soils is provided, if confirmed by investigations or discovered during the course of earthworks and construction.

This CSMP is intended as a framework for the development of specific contaminated soil control practices and procedures to minimise effects on health and safety and to reduce their impact on the environment. It is anticipated that a final document will be prepared by a Suitably Qualified and Experienced Practitioner (SQEP) on behalf of the successful contractor and should be submitted to Auckland Council and the construction Phase Suitably Qualified and Experienced Practitioner of contaminated land assessment (SQEP) prior to the commencement of ground disturbing works.

1.2 Purpose of this CSMP

The New Zealand Transport Agency (NZ Transport Agency) has engaged Aurecon New Zealand Ltd (Aurecon) to complete a Preliminary Site Investigation (PSI) to support the Notices of Requirement and resource consent applications for the proposed widening and infrastructure improvement works along nominated sections of State Highway 18 (SH18) and State Highway 1 (SH1) in Albany and Rosedale, as part of the Northern Corridor Improvements project (the Project). The CSMP is to be read in conjunction with Assessment of Land Contamination Effects report (provided at **Volume 3 – Technical Assessment 6**) and its appendices that include the PSI and the proposed Site Investigation Plan.

This draft CSMP is prepared based on the current understanding of the Project. However, final landform design and layout are yet to be confirmed by way of detailed design which will be undertaken in the Implementation Phase of the Project and contamination conditions may change from that assumed currently.

This version of the CSMP is intended to provide a framework for risk management within the Project corridor to support resource consent in accordance with the *Resource management (National*



Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

The CSMP should be considered as a living document as the Project advances and should be re-evaluated and updated as required, based on results of further investigation or discovery of unforeseen ground or contamination conditions.

The CSMP is not intended to and does not supersede any requirements established by the appointed contractors' own management plans. Instead its purpose is to provide additional detail regarding management of contaminated soil and groundwater that may be encountered during the excavation works.

A detailed assessment of the Rosedale Closed Landfill and management of contaminants from the landfill has not been included as part of the CSMP. The Rosedale Closed Landfill will be addressed in a separate technical report (see **Volume 3 – Technical Assessment 7**) addressing specific risks accordingly. There will also be a separate management plan to manage the effects of works on the Rosedale Closed Landfill.

1.3 Approach

In order to achieve the objectives set out within Section 1.2 a generalised CSMP has been prepared by Aurecon in accordance with Contaminated Land Management Guideline (CLMG) No. 1 to demonstrate that risks associated with contamination within the Project can be managed throughout the duration of works. This CSMP includes the following:

- Summary of proposed works and identification of potentially contaminating activities (Section 1).
- Outline of recommended roles and responsibilities for client, consultant and contractors engaged to work on this Project (Section 2).
- A preliminary plan and outline process for remediation of material determined by the results of the Detailed Site Investigation (DSI) to be unacceptable for retention on site on the basis of risk to human health and the environment (Section 3).
- A generalised methodology for handling of contaminated site and water (Section 4).
- A generalised methodology for handling of asbestos contaminated soils (Section 5).

A final CSMP, informed by the results of a future DSI, will be prepared by the appointed contractor engaged to deliver the Project.

1.4 Receiving Environment

The Project corridor is located in a moderately developed urban area and is dominated by a motorway. As such it is anticipated that at least 0.3 m of fill will be present over the whole route. The Project corridor's geology is presented on the Institute of Geological and Nuclear Sciences (IGNS) 1:250,000 scale map *Sheet 3 – Auckland*. The map indicates that the Project corridor is underlain by two geological units; the Puketoka Formation and East Coast Bays Formation.

There are three main catchments within the Project area, namely Alexandra Stream, Oteha Stream and Lucas Creek. These streams cross the Project area at CH1600 (SH18), CH14000 and CH11900 (SH1) respectively. Based on our understanding of ground conditions, a shallow water table is present within lower lying areas of the Project corridor that may be conversant with the level of surface water features. In areas of elevated topography, depth to a permanent groundwater table may be greater;



however perched water tables may exist within pockets of fill or Puketoka Formation following heavy rainfall events.

Based on geological and topographic information, it is expected that shallow groundwater flow will be directed towards local surface water bodies draining to Waitemata Harbour in the west.

1.5 Potentially contaminating activities

The Northern Corridor was constructed in phases over a 20 year period (between Oteha Valley Road and Albany Highway). It is inferred based primarily on aerial photography that, prior to the motorway being constructed, the Project area comprised mainly rural land use and consisted of pastoral grazing land and orchards. It was noted in the Project alignment's history that there may have been reworking/filling of the land in the Albany area due to gum digger excavations in the early 1900's (HAIL activity 1a). Other HAIL activities from this period of time included the construction of the Rosedale Landfill (now closed) in the 1950's.

Within the last 30 to 40 years the area around the Project corridor has steadily urbanised; developing from farmland to a mixture of commercial, industrial and residential land use.

This urbanised land use varies along the Project corridor, the area between Oteha Valley Road and the Greville Road having residential properties to the east and the Albany shopping and commercial area to the west. Of note are two petrol stations located within close proximity to the Project corridor in this area. Between Greville Road and the RWWT ponds the surrounding land use is mainly commercial but, of note, includes a waste transfer station, diesel garage and cement works.

For the remaining sections of SH1 (CH15500 to CH16550) the adjacent land uses are commercial (including waste transfer station and substation) and residential properties. To the south of SH18 are residential properties with land potentially filled with unknown fill. To the north of SH18 from CH1300 to Albany Highway are mainly commercial properties and includes two petrol stations, car maintenance as well as a scrap metal merchant and electroplater.

The PSI concludes that construction workers are among the most at risk receptors of contamination risk for this Project. To date, no intrusive land contamination investigations have been undertaken. As such it is assumed that each of the areas outlined in the HAIL drawing which is presented in **Appendix A** may contain soils which are contaminated (unless proved otherwise).

It should also be noted that as the existing State highway network was constructed through the 1980's and 2000's, recycled demolition materials such as crushed concrete may have been used as engineering materials. Based on our understanding of the Project area's development history, and our experiences working within similar projects, the infill material from this period has a significant chance of containing asbestos.



2 Roles and Responsibilities

2.1 Introduction

This section summarises recommended roles and assumed responsibilities for the management of contaminated or potentially contaminated fill which are presented in the following subsections. The NZ Transport Agency or appointed contractor may wish to appoint sub-consultants or contractors to assume certain responsibilities on their behalf. The roles and responsibilities are suggested only, but shall be finalised as part of the final CSMP. All identified roles should include clear lines of communication between all key project stakeholders. Contact details and phone numbers are to be identified within this document.

2.2 The Client

The NZ Transport Agency is the principal for all works and for the purposes of the Health and Safety at Work Act 2015 is the person conducting a business or undertaking (PCBU). The NZ Transport Agency is responsible for appointing the Principal Contractor and the Principal Consultant. The NZ Transport Agency may elect to appoint a project manager to represent their interests in addition to these parties.

2.3 Principal Consultant

The Principal Consultant is responsible for observing the works to provide reassurance that they are being carried out in accordance with the proposed design and that any variations to the design are documented and fit for purpose. The Principal Consultant is responsible for advising on the need for and reasonableness of any changes to the contract for the works. The Principal Consultant recommends an Environmental Consultant to deliver specialist services related to contaminated land within this scope.

2.4 Environmental Consultant (Suitably Qualified Environmental Practitioner)

The Environmental Consultant and their nominated SQEP will be responsible for activities associated with inspection and/or sampling of soil, such as:

- Identifying areas of potential soil contamination;
- Review of soil data and provision of advice with respect to appropriate management and/or off-site disposal of material; and
- Review and evaluation of analytical data obtained from soil monitoring programmes, the results of which will be presented in a Site Validation Report (SVR).

The SQEP will be available to provide on-going environmental advice and support to the Remediation Contractor as needed. Where necessary, the SQEP (with the Site Manager) will be responsible for on-going liaison with regulatory authorities and the community in relation to environmental issues.

The role of SQEP is determined by the Ministry for the Environment (MfE) but limits responsibility about the definition of this role. The determination as to who may qualify as a SQEP has more recently



been defined by WasteMINZ.¹ The minimum requirements of a SQEP suitable for performing this role as interpreted by WasteMINZ is the following:

- Tertiary science or engineering qualification relevant to environmental assessment that required the equivalent of at least three years full time study;
- Three years contaminated land assessment experience in the last five years;
- Ten years relevant post graduate environmental experience;
- Continuing professional development 40 hours per year contaminated site related;
- Peer recognition: three SQEP references as to suitability and relevance of qualification and experience; and
- Committed to operate in accordance with a code of ethics for environmental practitioners.

2.5 Principal Contractor

The Principal Contractor for the project is ultimately responsible for the overall compliance with prescribed legislation and guidelines relevant to the project. This is the company who hold the contract to complete the physical works. The Principal Contractor is responsible for finalising the CSMP and submitting it for certification by Auckland Council.

2.6 Site Manager

The Site Manager will ensure that the appointed Remediation Contractor (Principal) is prepared to implement environmental protection programmes, appropriate to their activities and to cooperate in any environmental management plans implemented on the Project.

The Site Manager will be the main contact and conduit for ongoing liaison between regulatory authorities. Advice from the Remediation Contractor may be sought as required. The Site Manager is responsible for ensuring that the works are completed in accordance with the contract.

2.7 Remediation Contractor

The Remediation Contractor will report directly to the Site Manager and will be responsible for implementing this plan with assistance and direction from Site Manager or Principal Consultant. The Remediation Contractor nominates a Remediation Manager. The Remediation Contractor has responsibility to ensure activities under their direct control are completed in compliance with this plan and related Work Procedures, Inspection Plans, Procedural Checklists and Environmental Management Plans, as applicable.

2.8 Remediation Manager

The responsibility for day-to-day site management lies with the Remediation Manager. The manager will be assisted by the nominated SQEP as necessary.

The Remediation Manager is responsible for ensuring that all employees and remediation subcontractors are fully cognisant of, and abide by, this plan.

The Remediation Manager will ensure all employees and subcontractors put into practice this plan and shall ensure that the factors that may compromise the achievement of overall project or environmental

¹ <http://www.wasteminz.org.nz/wp-content/uploads/SQEP-Accreditation-Draft-Table-May-2013.pdf>



objectives are brought to the attention of the Site Manager and the SQEP. The Remediation Manager will:

- Be responsible for ensuring employee and Remediation Contractor adherence to this plan;
- Maintain the content and implementation of induction training and tool box sessions;
- Keep records of who has been inducted;
- Be responsible for reporting all incidents in breach of this plan to the Site Manager and SQEP;
- Maintain a log of remedial earthworks operations and associated management and/or off-site disposal of material;
- Periodically inspect pollution management features and equipment to confirm availability and completeness; and
- If asbestos is encountered undertake and implement procedures and controls with respect to any asbestos containing material and management as outlined within this plan.

The Remediation Manager and SQEP shall, in conjunction, be responsible for the following:

- Inspection of excavations to determine extent of remediation;
- Identification of access controlled work areas; and
- Review and management of imported materials.

2.9 All Employees

All employees engaged in field activities and under the direct control of the Remediation Contractor shall comply with the requirements of this plan, the project Environmental Management Plan and any associated OH&S documentation and/or work plans.



3 Outline Remedial Plan

3.1 Introduction

The PSI undertaken has indicated that contamination is likely to be present within or directly adjacent to the Project corridor. Some of this material may be considered unsuitable for retention on-site without appropriate management or remediation. Where contamination is identified, the Principal Contractor will need to prepare a site specific Remedial Action Plan (RAP), which could be included within or separate to the final CSMP. The RAP will need to be prepared in accordance with the CLMG Vol 1.

Although quantities of contamination are currently unknown, if the contamination is likely to include asbestos the likely options for remediation will comprise:

- Removal;
- Encapsulation; and
- On-site in-situ or ex-situ management.

As a DSI has not yet been completed we cannot currently specify a methodology for remediation, however any specific remediation will require validation, which is discussed in Section 3.5.

As the nature of contamination of the Project corridor is currently uncertain the likely options for any remediation will include encapsulation, on-site treatment and removal of any contaminated soil to landfill. We note that the scale of this Project is conducive to soil and groundwater treatment, both in-situ and ex-situ. With three petrol filling stations within or adjacent to the Project corridor in addition to several print works and mechanics, the use of biopiles more than any other option may present a significant sustainable improvement for the Project should such contamination be identified.

Dependent on the final methodology, additional consenting may be required.

3.2 Remediation Action Plan

If the results of the DSI indicate significant contamination to be present within a specific area of the Project corridor, then remedial works to remove or make the area safe will need to be undertaken. The following general remedial methodology shall be undertaken:

- Preparation of a specific Remediation Action Plan, prepared by a SQEP on behalf of the contractor to discuss site specific remediation options for that location. The RAP must be approved by NZ Transport Agency and Auckland Council prior to the commencement of works. The RAP must:
 - Set appropriate remediation targets to ensure an area of the Project corridor will be suitable for intended use and pose no further risk to human health or the environment (Refer Section 3.3).
 - Provide an assessment of available remediation options available and present the rationale for the recommended remedial option.
 - Identify any regulatory requirements (including further consents, permits and approval).
 - Document in detail the procedures that must be undertaken to achieve an acceptable level of risk. This process may require additional preliminary works or further investigation to support options appraisal or volume calculations.
 - Establish a process to record works undertaken as part of the remediation activity.
 - Establish a validation process by which to demonstrate the risks following completion of work are now acceptable.



- Present a contingency plan if remedial goals cannot be achieved.

3.3 Remediation Targets

The nature of the contamination encountered within the Project corridor will depend on when the area can be classed as validated. The assessment of soils should be conducted in accordance with *Contaminated Land Management Guidelines*, within the framework of the *Resource Management Act 1991*. The relevant specific guidelines include:

- Auckland Council, 2016, Auckland Unitary Plan Operative in Part (15 November 2016)(AUP);
- MfE, 1999, Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (Revised 2011) (Module 4 – Tier 1 Soil Screening Criteria);
- MfE, 2011, Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, SR 2011/361, October;
- MfE, 2012, Users' Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, ME 1092; and
- MfE, 2004. Module 2: Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification, ME No. 510.

For asbestos contaminated soils, no asbestos contaminated soil is to remain at the surface of the Project area. In addition, while encapsulation may be completed and is planned within the Project corridor; until demonstrated otherwise, total removal is considered to be reasonably practical in the context of Clause 9 the Health and Safety at Work (Asbestos) Regulations 2016 for the Project area.

3.4 Preliminary Works

The following works are classified as Preliminary Works and may be implemented in advance or during the course of remediation.

3.4.1 Consenting and Approvals

The NZ Transport Agency, Principal Consultant and Principal Contractor are jointly responsible for ensuring all necessary resource consents have been obtained. A copy of this draft CSMP will be submitted with relevant resource consent applications, with the final CSMP being prepared by a SQEP on behalf of the contractor and being submitted to Auckland Council prior to the start of the earthworks. It is the contractor's responsibility to ensure that those approvals are complied with, as well as abiding by all laws and contract documents.

3.4.2 Site Establishment

The boundary of what is and what is not classified as contaminated is to be defined in the final version of this document and physically identified on-site by the Principal Contractor to ensure that all safety and environmental controls are implemented, including necessary contractor briefings and inductions for the remediation workforce. No plant or vehicles are to drive over the contaminated area.

3.4.3 Delineation Sampling

In order to further understand the extent of any contamination encountered by the DSI within the Project corridor, in advance or during the proposed earthworks delineation, sampling may be undertaken in the Project corridor to better define the extent or volume of impacted material. The aim of this sampling, the scope and requirement for which may be determined by the SQEP, is to minimise



the volume of soil that needs to be removed from the Project area, or better define the extent of soil required to go to managed or contaminated landfills. Any soil sampling shall be completed in accordance with the following legislation and guidelines:

- MfE, Contaminated Land Management Guidelines Nos. 1-5 (CLMG);
- MfE, 1999, Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (revised 2011);
- MfE, 2011, Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011, SR 2011/361, October;
- Health and Safety at work (Asbestos) Regulations 2016;
- Resource Management Act 1991 (RMA); and
- Worksafe New Zealand – Asbestos – New Zealand Guidelines for the management and removal of asbestos (3rd Edition), 2016.

Appropriate quality assurance and quality control measures must be followed and samples shall be analysed at an International Accreditation New Zealand (IANZ) accredited laboratory. The final scope of sampling works will be developed by a SQEP based on the potential areas of contamination identified during the PSI and the risks they pose to receptors.

3.5 Validation

3.5.1 Introduction

Following completion of any remediation, the SQEP will require validation to demonstrate acceptable risk and ongoing suitability. The process set out within this section of the CSMP presents a summary of the likely validation process for removal of excavated soils.

The validation may identify that further work is required which in turn will trigger the requirements of Sections 4 and 5 of this CSMP requiring additional validation until the SQEP is satisfied that risks to human health and the environment have been remediated. The process set out within this section is indicative only and will need to be confirmed by the SQEP as part of the final CSMP.

3.5.2 Soil Validation Process

3.5.2.1 Asbestos contaminated soils

Prior to testing, the soil must be visually clear of ACM. The validation of impacted soils will follow the procedure outlined in the following sections. Validation activities will be required for the following:

- Excavations formed by the removal of ACM contaminated areas; and
- The top 20 cm of the surface soil within 'disturbed areas' or 'designated work area' within proximity to the excavations.

Validation sampling is required to be undertaken to demonstrate any affected areas identified by the intrusive investigation have been remediated to a standard suitable for the proposed land use. All validation activities will be undertaken by the SQEP.

3.5.2.2 Other contaminated soils

At any location where waste materials or contaminated soils have been excavated, soils should be inspected by a SQEP to assess they are visually clear of any contamination that still remains within



soils below the area excavated. Depending on contaminants identified a methodology will be developed to validate the soils for the specific contaminants identified within the Project corridor.

3.5.3 Validation Sample Methodology

3.5.3.1 Asbestos contaminated soils

Validation of excavated areas will be undertaken as follows, in accordance with the Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (Western Australia, Department of Health, 2009) (WA DOH 2009 guidelines), CLMG and the NES_{Soil}:

- At the completion of the soil surface ACM removal/assessment, the specialist removal contractor will visually assess each grid within the delineated work area;
- The visual inspection will be undertaken by walking two sets of 1 m spaced transects set at right angles, to observe the presence of remaining ACM fragments;
- If following at least two (2) passes no surface ACM is detected within each grid area, the grid area will be deemed to have obtained visual clearance;
- If remaining ACM fragments are detected the material will be removed from the excavation until no further visible fragments are seen;
- Once visual clearance is attained validation sampling will then be undertaken by the SQEP to confirm the absence of asbestos fibres;
- Validation samples will be collected in accordance with the recommended sampling density in the WA DOH 2009 guidelines;
- All samples collected to be analysed for asbestos will be minimum of 100 mL in size, and analysed in accordance with the CLMG for the presence or absence of asbestos at an IANZ accredited laboratory;
- Where samples report the presence of asbestos, further excavation of contaminated soil will take place in consultation with the SQEP, and further validation samples will be tested for asbestos presence until it passes; sampling densities will be in accordance with WA DOH 2009 guidelines; and
- The final extent of excavation and all validation sample locations shall be recorded by an instrument survey.

3.5.3.2 Other soils

The methodology for validating other soils may change depending on the sites location within the Project corridor, soils encountered or the contaminant encountered. Validation sampling should be completed as per the requirements of the NES_{Soil} and CLMG and as a minimum the following methodology should be followed:

- SQEP to attend site to guide the Remediation Contractor to remove the contaminated soils from within Project corridor;
- Using visual checks or equipment such as a Photo Ionisation Detector (PID), soils should be screened on-site to identify whether contaminated soil has been remediated/removed;
- Validation samples should be taken in a grid pattern across the identified area of contamination;



- Samples of soil will be collected from the base and sides of excavations to validate soils by a SQEP;
- Soils should be inspected to assess whether they are visually clear of any contamination and should also be checked for any olfactory evidence that could still be emitted by the soils; and
- Samples collected will be submitted for characterisation to an IANZ accredited laboratory according to the nature of the contamination reported during the investigation within the Project corridor.

3.5.4 Documentation

All field observations and measurements will be documented by the Principal Contractor (and SQEP) in field sheets and in photographs. All field records, etc. will be placed on file for future reference. Soil samples will be registered in a central sample register. As a minimum, the table will include:

- Field ID of soil sample;
- Name(s) of samplers;
- Date and time of sampling;
- Depth of sample;
- Details of duplicates and triplicates;
- Observations of the sampled soil (e.g. colour, odour, sheen, etc.); and
- Photographs of the site (within the Project corridor) as well as any contamination and the validation areas.

3.5.5 Validation Reporting

A report will need to be produced presenting the results and findings of the remediation works and validation sampling in general accordance with the CLMG No. 1. The report will contain the following sections:

- Introduction, background and objectives;
- Site identification;
- Scope of works;
- Summary of previous investigations, site history, site condition and surrounding environment;
- Details of the remediation works conducted;
- Adopted assessment criteria;
- Quality control and quality assurance by assessment against DQOs, where required;
- Results of remediation effort including clearance certificates and validation results; and
- Conclusions and recommendations.

The report will include summary tables of analytical results and figures showing the sampling locations and exceedances of the adopted assessment criteria.



4 Contaminated Soil and Water Management

4.1 Introduction

This section provides guidance on the minimum measures required to protect human health and the environment during future activities in the Project corridor that disturb potentially contaminated soils or groundwater. Measures shall conform to Auckland Council guidelines and other relevant regulations. The measures are controls on subsurface works that will:

- Minimise worker and public contact with contaminated soil and groundwater;
- Ensure that waste soil and groundwater are appropriately managed;
- Minimise the potential for excavated material to be spread on the surface or migrate from the Project corridor through implementation of dust and erosion control measures; and
- Minimise risk to local sensitive environmental receptors.

There remains potential for contaminated material to be within the Project corridor that may affect construction development workers or other identified receptors. If asbestos is encountered these measures should be incorporated in addition to those specified in Section 5.

4.2 Contaminated soil definition

For the purposes of this plan contaminated soil is soil which contains hazardous substances at a concentration which could cause an immediate or long-term hazard to human health and/or the environment. With regard to soil, there are three basic categories of contamination:

4.2.1 Cleanfill

Cleanfill includes materials such as uncontaminated soils, cured asphalt, bricks, unreinforced concrete, fibre cement building products (excluding asbestos) and glass.

Non-cleanfill materials would include soils with analytical results showing detectable hydrocarbon compounds and/or exceedance of regional background concentrations of metals, asbestos containing materials, asphalt (new), green waste and household refuse. Waste soil meeting cleanfill criteria and requiring removal from the Project corridor is able to be disposed of in a landfill permitted for acceptance of cleanfill.

4.2.2 Managed fill

Managed fill comprises:

- Soil containing metal contaminants above regional background concentrations;
- Soil containing detectable concentrations of hydrocarbon compounds below risk assessment levels;
- Soil containing contaminants of concern above ecological risk based guideline values;
- Soil that does not contain hazardous substances or materials in the form of household and industrial waste, organic waste or asbestos containing material;
- Soil that meets the acceptance criteria of an appropriately consented Managed Fill site.



4.2.3 Contaminated fill

Contaminated fill in the context of this assessment constitutes:

- Hazardous materials in the form of household and industrial waste, organic waste or asbestos containing material; and
- Soil with contamination present above guideline values that cannot be accepted at a managed fill site.

4.2.4 NCI SH1/SH18 – preliminary waste soil classification

A DSI has not yet been undertaken for the Project corridor. As such, any fill material or soils disturbed within areas of potential contamination shall be handled and managed as contaminated until any further sampling and testing determines otherwise.

4.2.5 Sampling and classification of imported fill to site

Any soil or recycled aggregate imported to the Project corridor shall be sourced from a site for which a PSI or Detailed Site Investigation has been produced demonstrating that the site is not a HAIL site and that the soil is likely to be representative of background concentrations for nonvolcanic soils. In addition, imported soil of this nature shall be sampled and tested at a minimum rate of one sample for every 500 m³ with not less than three samples tested per source, testing shall as a minimum include:

- Total organic content;
- Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn);
- Semi-volatile organic compounds suite;
- Asbestos presence/ absence; and
- Total petroleum hydrocarbons.

Semi-volatile organic compounds suite and total petroleum hydrocarbons shall not be required on materials with a major component (i.e 50% or more by mass) with a particle size greater than 2mm. All imported material of this nature shall comply with cleanfill criteria. The Principal Contractor should advise the SQEP in advance to confirm a suitable testing schedule, which may vary depending on the source of fill. It is recommended that any imported fill material acquired from outside a quarry or an alternative source is tested at its source prior to transport to the works site. If this cannot be achieved then the Principal Contractor shall temporarily stockpile the fill on-site until test results are available.

4.3 Soil Management

The general actions to be taken to manage issues associated with potentially contaminated or contaminated soil are listed below and described in more detail in the subsections that follow. This includes the following:

- a) Soil and surface stability will be maintained at all times in accordance with Auckland Council's 'Technical Publication 90 - Erosion and Sediment Control Guideline for Land Disturbing Activities in the Auckland Region' (TP90). Soil stockpiles will have designated stockpile areas which will be established prior to generation of waste soil. Stockpiled soil will be managed to control contamination of underlying soil and erosion in accordance with Section 4.7 of this plan.
- b) When stockpiling contaminated soil, erosion and sediment controls, including run-on/run-off control devices, they will be maintained and functional at all times to prevent erosion in accordance with Auckland Council's 'Technical Publication 90 Erosion and Sediment Control Guideline for Land Disturbing Activities in the Auckland Region'. Specifically, sediment control measures will be used



to preserve stockpiled soils to minimise siltation of any land surface and water or blockage of any existing drainage channels. All staff involved in excavation works shall immediately report any visual or olfactory (smells, odours) evidence of contamination to the site manager. The Site manager will consult with a suitably qualified environmental practitioner when evidence of contaminated material is reported and decide on the best option for managing these materials.

- c) The Principal Contractor shall maintain daily records of where excavation of contaminated or suspected material has occurred, the type and volume of any contaminated material excavated, and where that material has been disposed of, stored or stockpiled. This shall include maintaining all relevant documentation, including disposal certificates, as appropriate.
- d) Where waste is disposed of at an off-site facility, the receiving facility must be licensed to accept such material. The waste must be documented under the waste tracking process and using waste tracking forms as appropriate. These shall be kept and maintained on-site.
- e) The Principal Contractor shall maintain a register of landfill soil disposal and liquid disposal activities and record the location of contaminated soil excavations, disposal location, quantity of contaminated material and off-site weighbridge documents.
- f) The Principal Contractor shall maintain a register of deposition/disposal of excavated contaminated soil that qualifies as waste soil. This soil should be handled as the appropriate category of waste soil, based on representative in-situ or ex-situ sampling performed by a SQEP in accordance with CLMG No. 5 - Site Investigation and Analysis of Soils (revised 2011). If material is transported off-site, it will be done using appropriately authorised waste transporters for disposal at an appropriately licensed landfill.
- g) Upon completion of soil excavation, all plant and equipment shall be cleaned and decontaminated in an appropriate manner. Where wheel washes are utilised, wastewater shall be collected and disposed of (with treatment if required) or recycled in accordance with New Zealand Municipal Wastewater Monitoring Guidelines (MfE, 2002).
- h) Material not demonstrated to be imported from virgin ground shall have been tested at a minimum rate of one sample per 250 cubic metres (m³), but not less than three samples, for an appropriate suite of contaminants to demonstrate that it is acceptable for reuse within the Project corridor as cleanfill. The Principal Contractor must notify the Environmental Consultant if such material is to be imported.
- i) General uncontaminated fill material generated within the Project corridor should be separated from areas of potentially contaminated fill. Stockpiled soil should be treated as contaminated, with all appropriate worker safety measures implemented, until determined otherwise.

Any soil sampling shall be in accordance with the RMA, CLMG Nos. 1-5, NES_{Soil}, and Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (MfE, 2011). Appropriate quality assurance and quality control measures must be followed and analysis of samples shall be at an IANZ accredited laboratory.

4.4 Groundwater Management

In the event that significant quantities of groundwater are encountered, it should be handled in accordance with Auckland Council's '*Technical Publication 90 Erosion and Sediment Control Guideline for Land Disturbing Activities in the Auckland Region*'.

The water should be sampled and, if found to be contaminated in excess of guidelines provided in New Zealand Municipal Wastewater Monitoring Guidelines (MfE, 2002) or other appropriate references, pumped and collected in drums or tanks on-site for removal to a suitable facility authorised



to receive wastewater for treatment and disposal. Records of this disposal shall be kept and maintained on-site.

It is recommended that, where possible, areas requiring significant dewatering are tested during the course of any future DSI to confirm quality of groundwater and to budget for appropriate discharge and handling methodology. Specific methodologies related to the handling and disposal of contaminated groundwater should be included as part of the Principal Contractor's own CSMP.

4.5 Dust and Odour Control

Contaminated dust may settle on surfaces on-site or off-site, presenting a potential risk to human health and ecological receptors. Dust must be minimised to the greatest extent possible in accordance with the Auckland Council's *Technical Publication 90 Erosion and Sediment control Guidelines for Land Disturbance Activities* in the Auckland Region. A water tanker (or equivalent) will be kept on-site and used for dust control. Waste soil, including stockpiled soil, will be kept adequately wetted to minimise dust. Stockpiles will be tamped and material will not be added or removed from stockpiles during high wind events.

Dust may be created during construction due to vehicular movement on unsealed roads and ground disturbing activities. Site personnel, the public, adjacent neighbours and the environment need to be protected from the effects of dust created during the works. The works shall be conducted, and dust suppression techniques shall be employed, such that there shall be no visible generation of dust. The open working areas used by machinery will be dampened down periodically to reduce dust generation. During the remediation works, the following methods will be employed to minimise dust generation and distribution:

- Dampening the surface working area with hose or similar control;
- Protecting stockpiles/stored materials within sealed waste skips and / or wetting down the surface of the stockpile (if required);
- Ceasing work in strong winds; and
- Undertaking the loading or unloading of dry soil at the source to prevent the spread of loose material within and outside the Project corridor.

In the event of accidental discovery of odorous contaminated materials (such as degrading hydrocarbons), it may be necessary to replace cover material over the contaminated materials to reduce odour and to excavate in a manner that exposes a small area at a time, allows it to ventilate, then exposes another small area, and so on. Equipment, such as diesel-powered vehicles (trucks, excavators, etc.), will not be left running when not in use to help minimise exhaust odours.

4.6 Stockpile Construction and Management

In general, materials generated during excavation works with a potential to produce leachate and contaminated run-off should be stored in a sealed and bunded area in order to divert stormwater away from the waste, and contain and prevent impact from potentially contaminated run-off. Covering these materials may also be required to reduce the potential for leachate generation or to prevent or minimise gaseous or dust or other emissions.

Stockpile management areas will be constructed in accordance with guidelines presented in *Technical Publication 90 Erosion and Sediment control Guidelines for Land Disturbance Activities in the Auckland Region* prior to start of activities which may generate waste soil. Heavy duty plastic, such as high density polyethylene (HDPE), will be placed on a hardstand surface in a designated area prior to



placing stockpiled material. Soil stockpiles will be kept clean and tidy, no less than 4 m in height and with a compacted stable slope. Stockpiles will not be placed within the bed or banks of watercourses and vehicular movement over stockpiled soil will not be allowed.

Bunds or sediment fences will be constructed or installed around the edges of the stockpile management area to prevent stormwater run-off from carrying contaminated or potentially contaminated soil away from the stockpile management area. The bunds will also assist in directing clean stormwater around the stockpiles.

Except when material is being added or removed, water will be sprayed on the stockpiles in sufficient quantity to prevent dust generation, without causing run-off, and maintained in that state through additional application of water as necessary. Additions to the stockpile will not be made during high wind events. Where stockpiled material is odorous it should be covered with an impermeable material or other form of odour suppression (e.g. application of odour suppression compounds) to limit the release of odour or vapour off-site.

Liquid levels within the bunds shall be monitored and if exceeding more than 10% of the bund volume shall either be resprayed onto the stockpile or be removed from the site as hazardous liquid waste by an approved waste handler. Waste disposal dockets shall be kept and reported in any final validation report.

4.7 Earthworks documentation

Auckland Council may require the Principal Contractor to demonstrate that the proposed earthworks have been undertaken with the agreed procedures and in compliance with the CSMP.

To assist with this, all correspondence with relevant Project stakeholders should be recorded and logged. The Principal Contractor shall maintain a complete record of earthworks undertaken on site. This should include but not be limited to:

- Location of earthworks;
- Type and volume of material excavated;
- Location of temporary stockpile (if stockpiled);
- Record of sampling undertaken and laboratory results;
- Any fill that has been retained on site;
- Final disposal location (if off-site) with supporting haulage dockets and disposal certificates; and
- Any further validation sampling and testing of soils remaining on site (if required).

4.8 Spill Response – Hazardous Materials

In addition to providing and maintaining an adequate quantity of spill response kits, each contractor operating within the Project corridor will be required to prepare and follow an emergency spill response plan that addresses stopping the spillage, containing the spill, clearing the area, calling for assistance, cleaning up the spill, and reporting the spill.

4.9 Emergency Response

In the event that an emergency arises, a potentially dangerous situation is encountered or any suspect/unknown material is identified, work is to cease immediately and the matter reported to the Site Manager for immediate assessment and action. An emergency will include, but not be limited to:



- Any personnel is involved in an accident or experiences adverse symptoms of exposure while on-site;
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated and that the appropriate safety equipment is not available; or
- A breach of the exclusion zone (Designated Work Area) by non-approved personnel.

The following procedures will be employed by contractor/consultant personnel in potentially hazardous areas:

- In the event that any personnel experiences any adverse symptoms of exposure whilst on-site, work will be halted and instruction or assistance sought from the Site Manager;
- In the event of an accident, the Site Supervisor and the injured person will compile an incident report, which will be submitted to the Principal Contractor within 24 hours of the incident. Follow-up actions will be carried out to correct situation;
- In the event that an emergency situation arises, the Site Supervisor must address the problem and notify the ambulance, fire brigade and police if necessary. In addition, the Principal Contractor must be notified immediately;
- To minimise the impact of an emergency situation, at least one of the Principal Contractor's personnel will be trained in basic First Aid procedures and all field personnel will have immediate access to a First Aid kit; and
- Emergency phone numbers will be made available at the commencement of the project and displayed throughout the project in the site office including ambulance, fire brigade, police and the nearest hospital. All these services can be called on 111 in a life-threatening emergency. In addition, the mobile phone numbers of the Site Supervisor and the Principal Contractor will be made available.

Even in the event of an emergency, decontamination procedures should be adhered to unless there is a direct risk to human health.

4.10 Unexpected Contamination Discovery Protocol

If contaminated or potentially contaminated materials not identified by works conducted to date are discovered during construction, work must be stopped in the area of contamination. This is particularly important if material that may contain asbestos is encountered. Contamination discoveries also include the presence of discoloured surface water (including sheens or slicks), unusual odours, gas bubbles in pooled surface water, oily substances, or fibrous materials.

If newly discovered contaminated material is encountered, it will be placed on plastic, covered, and protected from stormwater run-on and run-off. The Site manager will consult with a suitably qualified environmental practitioner to evaluate the material and determine the appropriate disposition and course of action.

Should asbestos be observed or suspected during the excavation works, all work shall cease and the Worksafe New Zealand Guidelines for the management and removal of asbestos (3rd Edition) and Health & Safety at work (Asbestos) Regulations 2016 will be followed. Works can recommence once all asbestos has been removed safely. Any such asbestos works (assessment, delineation, removal and verification) would be undertaken by a specialist asbestos contractor. A first response protocol for unexpected contamination is provided below:

- a) Stop work immediately and isolate work site from other site users (fencing, cones, taping off);



- b) Advise site manager and NZ Transport Agency;
- c) Implement agreed health and safety procedures (if not done so already);
- d) Update the site hazard register;
- e) Provide dust masks if asbestos suspected (if not done so already);
- f) Where noxious or unpleasant odours are noted, cover the material with cleanfill, impermeable liner to prevent nuisance to off-site receptors;
- g) Establish dust, erosion and sedimentation controls;
- h) Contact site contamination specialist; and
- i) Contact Auckland Council.

Further details on asbestos removal and management procedures are detailed within Section 5.

4.11 Complaints

A complaint log will be established and will include the date/time the complaint was received, source and nature of the complaint, weather conditions, and resolution. The complaint log shall be maintained for the duration of the Project.

Due to the nature of the activities and type of contaminants identified along the Project corridor there is a potential for complaints to be received from members of the public relating to environmental emissions including:

- Noise and vibration arising from excavation; and
- Dust emissions arising from excavation, material handling, transport and placement.

Monitoring of all environmental emissions shall be undertaken during the works as detailed in this report and appropriate actions taken to further control emissions following receipt of a complaint. Such additional controls may include the following actions:

- Disturbance of soils during meteorologically favourable periods only;
- Covering or wetting down soils which are generating dust;
- Air monitoring for dust; and/or
- All complaints shall be referred to the Site Manager who will record in a complaint log book.



5 Asbestos removal and management protocols

5.1 Overview

This section describes the additional controls required if handling asbestos contaminated soils. In addition to these a certificate of competence holder for asbestos removal must manage the work and notify Worksafe as required by New Zealand Guidelines for the management and removal of asbestos (3rd Edition), 2016.

- Access to the area(s) will be restricted by means of a fence until analytical results indicate it is free of asbestos;
- Excavation of the contaminated material from areas identified, following visual evidence of buried construction waste as a guide;
- All material to be placed directly into lined trucks for off-site disposal. Please refer to Section 5.3.1 for guidance on transport of soil containing ACM;
- Disposal of the material to an appropriately licensed waste facility;
- Excavations are to be validated as per Section 3;
- Where further asbestos contamination is evident in the walls (if any) and the bases of excavation area this must be documented in the validation report;
- Where asbestos contamination extends past the scoped work this must be appropriately capped with validated cleanfill and an isolating barrier where appropriate;
- No asbestos contamination must be left uncapped;
- Should excavation validation fail the failed location will be re-excavated as directed by the Environmental Consultant and the validation process repeated until validation is achieved;
- Decontamination of the excavator will involve the removal of gross soil by hand tools from the bucket over the double lined truck or trailer;
- If required the bucket will be washed with water over the double lined truck to ensure it is free of ACM fragments;
- Soil in the excavator tracks will be removed by hand by means of shovel and broom;
- An asbestos clearance survey will be provided by certificate of competence holder prior to demobilisation of the excavator.

If, during remedial works, further suspected ACM is observed within parts of the Project corridor where it has not yet been identified then the remedial works should cease immediately and an appropriately qualified consultant should review and assess the material and/or the site condition. If the presence of asbestos is confirmed, then the remedial works should be expanded to include these areas.

5.2 Additional Health and Safety and Legislative Requirements

In general, the asbestos removal management controls will cover the following:

- All site workers should have completed an asbestos awareness course;



- The Contractor coordinating the asbestos removal works shall be qualified and recognised by Worksafe as an asbestos removals specialist;
- Any personnel involved with asbestos impacted soil or material must have appropriate training and experience for handling asbestos materials and of the required decontamination procedures. Only the Remediation Contractor will physically (by hand) remove fragments of asbestos containing materials from the ground surface;
- Access to the asbestos removal area will only be allowed by personnel at completion of asbestos removal by completion of remediation in the work area. This access restriction will be lifted once the asbestos specialist has carried out a visual inspection and given a clearance for the specific area; and
- Decontamination facilities are to be provided and maintained by the asbestos contractor for all personnel working at the Designated Work Area (as defined by the New Zealand Guidelines for the management and removal of asbestos (3rd Edition), 2016).

5.2.1 Security Signs and Barricades

When asbestos containing materials are being removed, signs and barriers **MUST** be erected to warn of the danger and to prevent unauthorised people entering. The asbestos removal working area is to be clearly defined and all barriers and warning signs should remain in place until removal is complete. The location and extent of any access control areas will be agreed in discussion between the Principal Contractor and the Environmental Consultant and will be established in accordance with WorkSafe NZ's New Zealand Guidelines for the management and removal of asbestos (3rd Edition), 2016.

The extent of controlled areas will be set with the objective of preventing unacceptable exposures to personnel working in other areas of the site and/or adjacent to the site. Potential entry points to the asbestos work area should be signposted or labelled. Any waste bags, skips, or vehicle trays used to store and/or transport potentially asbestos containing material should be appropriately labelled advising handlers of the nature of the contents.

5.2.2 Personal Protective Equipment (PPE)

Only personnel with appropriate PPE and training will be allowed to work inside the asbestos work area. The minimum asbestos specific protective equipment to be worn is as follows:

- Disposable coveralls (Tyvek or similar);
- Non-lace safety boots with rubber soles (so they can be easily wiped down);
- Disposable gloves; and
- Respirators (in line with WorkSafe NZ's PPE guidelines).

The protective clothing will be provided by the Principal Contractor daily to employees at the commencement of their work shift at the Change Area (see section 5.2.4.3). Protective clothing is only for use in the Designated Work Area and will not be used outside of this area.

Once workers are inside the Designated Work Area, they are not permitted outside of that area without proceeding through the appropriate decontamination procedures. No employee is permitted to remove any disposable protective clothing from the site. Contaminated overalls and PPE are to be disposed of with the asbestos contaminated waste materials in appropriately labelled waste bins or bags. These requirements are specified as a minimum standard and may be modified at the discretion of the Remediation Contractor and/or Site Manager during the course of the remediation works.



5.2.3 Air Monitoring

Air monitoring is typically used to improve works over a long duration or where critical receptors are located near to the works which is not directly relevant to this site. On the basis that the ACM is largely non-friable and is characterised by occasional scattered fragments not representing a significant portion of the soil to be removed, air monitoring is not currently required. However air monitoring may prove useful in the event that other control measures fail and it becomes necessary to demonstrate that release of fibres was insignificant. Alternative controls to suppress dust and other material can be implemented but air monitoring can offer peace of mind although it can only ever be reactive and is not preventative.

If an asbestos air monitoring programme is implemented for the period of works it will be to ascertain that no asbestos fibres escape the Designated Work Area(s) through the course of the planned work covered by this CSMP. The air monitoring also acts as a hold point for daily review of risk and potential cease work requirements. All air monitoring works will be performed in accordance with the WorkSafe NZ's New Zealand guidelines for the management and removal of asbestos (3rd Edition), 2016.

In terms of protecting public health, the target background level within the static air samplers (if used/needed) will be the detection limit of 0.01 fibres/mL (10 times below the occupational limit). It is proposed that excavation work will cease while dust management procedures are reviewed if this target criterion is exceeded.

5.2.4 Decontamination

Decontamination must include the asbestos work area, all tools and equipment utilised and personal decontamination. All contaminated materials which cannot be cleaned, including cleaning rags, plastic sheeting and PPE etc., must be disposed of as contaminated waste.

5.2.4.1 Decontamination Area

A decontamination area should be established on-site for the use of the personnel conducting the asbestos remediation works. The decontamination area will comprise a segregated area where any contaminated work clothing and respirators are removed and discarded.

Prior to any work commencing on any of the Designated Work Areas, suitable barricades are to be erected around the boundary of the work site. Asbestos Warning Signage will be provided at suitable intervals and at all entrances detailing the restriction of access to the site.

The following procedures have been written utilising the decontamination procedures outlined in the WorkSafe NZ's New Zealand guidelines for the management and removal of asbestos (3rd Edition), 2016 and Health and Safety at work (Asbestos) Regulations 2016.

5.2.4.2 Tools and Equipment

At the end of removal work all tools, where required, should be decontaminated in the following manner:

- Decontaminated using wet or dry decontamination methods as outlined in the National Occupational Health and Safety Commission Code of Practice for the Safe Removal of Asbestos (2nd Edition, 2005) (NOHSC: 2002 (2005)) (i.e. fully dismantled and cleaned under controlled conditions); or
- Placed in sealed containers (and used only for asbestos removal work); or
- Disposed of as asbestos waste.



If tools cannot be decontaminated within the asbestos work area, or are to be re-used on another project, they should be tagged to indicate possible contamination and double bagged in asbestos waste bags before being removed from the asbestos work area.

5.2.4.3 Personnel Decontamination

All personnel while working within the Designated Work Areas or in any other way being affected by asbestos contaminated material will be required to decontaminate at the end of each work shift (i.e. before morning tea, lunch and afternoon tea) and at the end of the work day.

The Change Area is the area in which potentially contaminated PPE must be removed prior to leaving the Designated Work Area. It is to be located at the entry to the work Designated Work Area. It must not be used for purposes other than decontamination. It must not be used as a materials storage area. All personnel leaving the asbestos work area must use the Change Area prior to leaving the site.

As a minimum personal respiratory (P2) protective equipment should continue to be worn until all contaminated disposable coveralls and clothing have been vacuumed and/or removed and bagged for disposal; and personal washing completed. Personnel are required to ensure that no asbestos soiled clothes or PPE leave the decontamination area to the 'clean end' of the area. Personal protective equipment (PPE) is to be provided to all personnel working in the Designated Work Areas and must be available within the decontamination area.

5.2.4.4 Vehicle Decontamination

To prevent the spread of contaminated material back into remediated areas, general site and road going vehicles cannot enter the contaminated areas. Dedicated machinery is to be used within the contaminated areas and this is to be appropriately decontaminated at the completion of the works. Such decontamination will depend on the soil and contamination present but may include steam cleaning of plant or inspection and clearance by an asbestos assessor. Measures outlined within Section 5.3.1 relating to transport of impacted material must also be adhered to for the purpose of achieving suitable vehicle decontamination.

Any remaining plastic sheeting is to be rolled up and placed in the final truck to leave the site. The loads on all trucks are to be covered with tarpaulins prior to leaving site, to minimise loss of contaminated materials and the generation of dust during transport.

5.3 Offsite Disposal

Soil containing asbestos will not meet cleanfill nor managed fill criteria. Therefore, in terms of disposal, soil containing asbestos can only be accepted at contaminated landfills such as Redvale or Hampton Downs in the Auckland area.

5.3.1 Transport and Disposal of ACM

Asbestos contaminated soil is to be placed into plastic lined trucks. The plastic shall be sealed with tape and will enclose the soil minimising the potential for drying of the soil and subsequent dust generation from the soil releasing asbestos fibres. At least two layers of encapsulation are required, the second of which can be the truck itself if a good condition cover is also provided.

After asbestos fragments and asbestos contaminated soils have been removed, all asbestos waste, including soiled PPE, shall be placed into 0.2 mm polyethylene plastic bags marked with "Asbestos Waste" which are to be sealed by wire ties or tape and then suitably washed. The bags shall then be placed in bins lined with 0.2 mm polyethylene sheeting and transported in leak-proof vehicles for disposal at an approved regional asbestos waste disposal depot. Should it be necessary to temporarily store asbestos waste prior to transport to the waste facility then all plastic bags containing



the waste shall be held in leak-proof metal containers or bins suitably marked and held in a secured area displaying appropriate warning signs.

Solid asbestos waste (if encountered) shall be collected and double bagged in heavy duty, low-density polyethylene 0.2 mm thick bags. A maximum bag size of 1,200 mm (length) x 900 mm (width) shall be observed and bags shall be filled to no more than 50 per cent capacity. The loaded weight of the bag shall not exceed 20 kg. Each bag or other container shall be labelled on its outermost surface with warning statements. Bags or primary containers which have held asbestos shall not be re-used, and containers marked as above shall not be used for any other purpose.

Transport of asbestos waste material shall be undertaken in plastic lined leak-proof vehicles or in air leak-proof vehicles that are covered so that no spillage or dispersal of the waste to the atmosphere occurs. Care must be taken to ensure that the integrity of the plastic bags is not damaged during handling or transportation. In particular, bags of asbestos waste shall not be thrown or dropped from a height, (which may rupture the bag). Vehicles may be checked for cleanliness prior to leaving the site.

Controlled wetting of waste shall be employed, where practicable, to reduce dust emission during bag sealing and in cases of accidental bag rupture, during transportation. Excessive water logging shall be avoided as the excess of contaminated water may leak out of the bags, thereby creating a future source of airborne dust. The asbestos waste shall be disposed of at a site and in a manner as approved by Auckland Council. Documentary evidence of the disposal shall be collected and provided. This will include name of the authorised tip, weighbridge docket and registration number of vehicle for every disposal. This information shall be passed to the SQEP for presentation within the SVR. Copies of waste disposal certificates and related documentation must be kept by the Remediation Contractor and supplied to the Site Manager.

5.4 Encapsulation

Several areas of significant fill are present across the route. If significant volumes of asbestos contaminated soils are identified that otherwise meet the cleanfill definition then encapsulation would represent a more sustainable option than landfill disposal. For such material to be encapsulated the following minimum cap must be used to cover the soil:

- All asbestos contaminated soil to be overlain by;
 - A geofabric marker overlain by;
 - 100 mm hard to dig layer e.g. GAP65 overlain by; or
 - 200 mm of controlled fill.

Such a fill must be documented and the cap inspected on an annual basis. Five yearly asbestos management plans must be submitted to Worksafe NZ by the NZ Transport Agency and validation of the cap shall be by instrument survey and photograph record.



6 Limitations

Information provided in this plan and the subsequent findings herein are reliant on a limited selection of information provided by the NZ Transport Agency. Aurecon takes no responsibility for the quality / accuracy of information provided by third parties.

The outcome of this plan is limited to information supplied for the activities associated with the scope of Project works only. It is intended that this provides a description of the identified soil contamination and recommendations on how to address and manage any contamination issues at the location in question.

We note that this plan has been prepared for the use by the NZ Transport Agency and appointed subcontractors only and is based on information provided by them. Aurecon takes no responsibility and disclaims all liability whatsoever for any loss or damage that the NZ Transport Agency may suffer as a result of using or relying on any such information or recommendations contained in this plan, except to the extent Aurecon expressly indicates in this plan that it has verified the information to its satisfaction.

Should further information become available regarding the conditions in the Project area, including previously unknown likely sources of contamination, Aurecon reserves the right to review this plan in the context of the additional information.

The plan may contain various remarks about and observations on legal documents and arrangements such as contracts, supply arrangements, leases, licences, permits and authorities. A consulting engineer can make remarks and observations about the technical aspects and implications of those documents and general remarks and observations of a non-legal nature about the context of those documents. However, as a consulting engineer Aurecon is not qualified, cannot express and should not be taken as in any way expressing any opinion or conclusion about the legal status, validity, enforceability, effect, completeness or effectiveness of those arrangements or documents or whether what is provided for is effectively provided for. They are matters for legal advice.

Appendices





This page has been intentionally left blank.

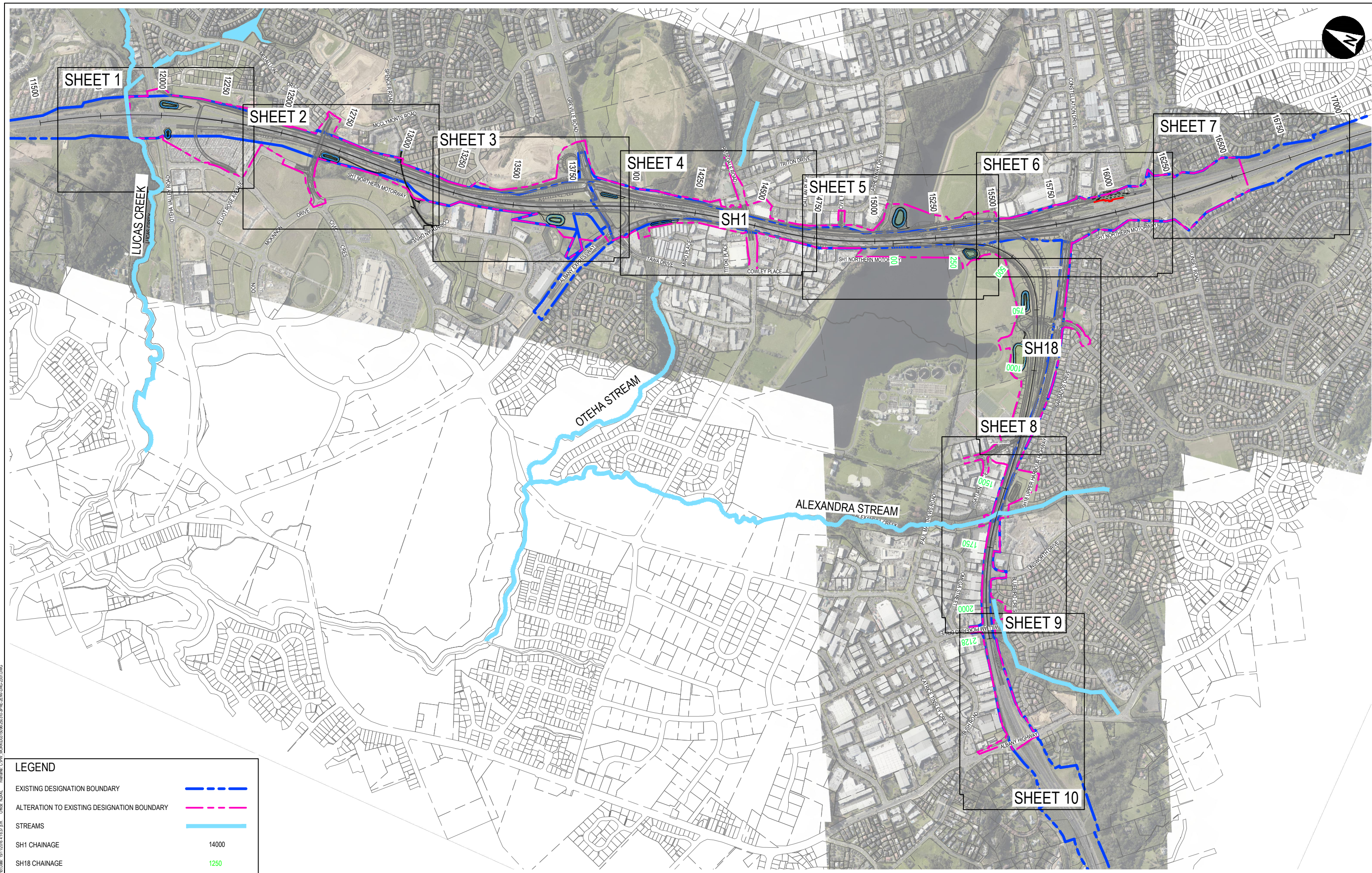


Appendix A

Drawings



This page has been intentionally left blank.



File Path: I:\15110156_41627.dwg
 Date: 15/11/16 4:16:27 pm
 User: NZAS
 Plotter: HP DesignJet 2400

LEGEND	
EXISTING DESIGNATION BOUNDARY	
ALTERATION TO EXISTING DESIGNATION BOUNDARY	
STREAMS	
SH1 CHAINAGE	14000
SH18 CHAINAGE	1250

CLIENT		REV		DATE	REVISION DETAILS	APPROVED	SCALE	SIZE	PRELIMINARY NOT FOR CONSTRUCTION		PROJECT	NORTHERN CORRIDOR IMPROVEMENTS					
		A	17/10/16		PRELIMINARY ISSUE	T. DEE	NOT TO SCALE	A1									
		B	15/11/16		FINAL FOR CONSENT												
							DRAWN		APPROVED		TITLE	SITE LAYOUT PLAN					
							V. SMITH		DATE								
							G. BECK										
							CHECKED		J. HIND		DRAWING No.	PROJECT No.	STAGE	WP	TYPE	NUMBER	REV
							R. GRIFFITHS				250310	250310	3PRE	2ENV	DRG	2301	B





This page has been intentionally left blank.



This page has been intentionally left blank.

In partnership with:



flow
TRANSPORTATION SPECIALISTS



Consulting Biologists - Est. 1972



PEERS BROWN MILLER
arboricultural & environmental consultants

Aurecon New Zealand Ltd
Level 4, 139 Carlton Gore Rd
Newmarket Auckland 1023
PO Box 9762
Newmarket Auckland 1149
New Zealand

T +64 9 520 6019
F +64 9 524 7815
W aurecongroup.com

