Attachment 10

Draft Contaminated Soils Management Plan prepared by Beca

Contaminated Soils Management Plan

May Road Development

Prepared for May 1 Limited
Prepared by Beca Limited

22 June 2022

Contents

Revision History

Revision Nº	Prepared By	Description	Date
1	Vicky Kennaugh	Initial	10 February 2022
2	Vicky Kennaugh	For Resource Consent Application	14 April 2022
3	Vicky Kennaugh	For Resource Consent Application	22 June 2022

Document Acceptance

Action	Name	Signed	Date
Prepared by	Vicky Kennaugh		22 June 2022
Reviewed by	Phillip Ware, CEnvP Site Contamination		22 June 2022
Approved by	Dale Paice		22 June 2022
on behalf of	Beca Limited		

Glossary

Term	Definition
ACD	Asbestos containing dust, meaning dust or debris that has settled and is or is assumed to be contaminated with asbestos. In the guidelines, FA/AF is used in its place.
ACM	Asbestos Containing Material. This can be a product or material containing any amount or percentage of asbestos by volume. ACMs come in many different forms and contain varying levels of asbestos fibres
Asbestos	The fibrous form of the mineral silicates belonging to any one or a combination of the serpentine and amphibole groups of rock-forming minerals, including actinolite, amosite (brown asbestos), anthophyllite, crocidolite (blue asbestos), chrysotile (white asbestos), or tremolite
Asbestos Cement	Also referred to as “fibre cement”. A hard product that contains approximately 10 -15% asbestos fibres which can be any of the three main types. Examples of common applications are roof sheets, wall cladding, and rainwater goods such as soil pipes and guttering. This is a relatively low risk material provided it remains intact as the fibres are bonded within the cement matrix
Asbestos Regulations	Regulations made under the Health & Safety at Work (Asbestos) Regulations 2016 which control management of and work with ACMs, their removal and disposal together with the responsibilities of employers, managers, employees, contractors, visitors, and designers
Asbestos Waste	Waste containing asbestos is normally deemed as being hazardous waste and stringent regulations apply for carriage on the highways and its disposal. Enforced by the Environmental Agency, a license is required for transporting asbestos on the public highway
asl	Above Sea Level
bgl	Below Ground Level
Bulk Sample	A sample of material such as boarding, insulation or debris taken by an accredited surveyor to be tested for asbestos fibre content/type by an accredited laboratory
Chrysotile	Technical name for ‘white’ asbestos fibres
Class A	Removal work involving asbestos that requires a Class A licensed asbestos removalist, usually involving friable asbestos
Class B	Removal work involving asbestos that requires a Class B licensed asbestos removalist, usually involving non-friable asbestos or ACM
CLMG	Contaminated Land Management Guidelines
Control Measure	Something that will reduce the risk posed by a hazard
CSM	Conceptual Site Model
FA and/or AF	Fibrous Asbestos and Asbestos Fines
Friable	Asbestos that is in powder form or able to be reduced to powder form by hand pressure. Non-friable asbestos can become friable with age and if not handled correctly
HAIL	Hazardous Activity and Industry List
Independent Licensed Asbestos Assessor	A person who is licensed by WorkSafe New Zealand to conduct air monitoring and clearance inspections for friable and non-friable asbestos projects
IANZ	International Accreditation New Zealand

Term	Definition
Licensed asbestos removalist	A PCBU with a Class A or Class B license for asbestos removal
LOD	Level of Detection
MfE	Ministry for the Environment
NESCS	National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health
Non-friable	Material containing asbestos fibres re-enforced with a bonding compound
PAH	Polycyclic Aromatic Hydrocarbons
PCBU	Person conducting a business or undertaking
PFAS	Per & poly fluoroalkyl substances
PFHxA	Perfluorohexanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PID	Photoionization Detector
PPE	Personal Protective Equipment such as overalls, masks, gloves etc
Respirable asbestos fibre	A particle of asbestos that is less than 3 microns in width, greater than 5 microns in length, and has a length to width ratio greater than 3:1
RMA	Resource Management Act
RPD	Relative Percentage Difference
RPE	Respiratory Protective Equipment such as either a full or half face mask
SQEP	Suitably Qualified and Experienced Practitioner
TPH	Total Petroleum Hydrocarbons
Unlicensed	Work involving asbestos that does not require a licensed asbestos removalist
Visual Inspection	An inspection of the enclosure/work area by the Independent Asbestos Assessor to see if all the ACMs specified have been satisfactorily remediated prior to carrying out an Airborne Fibre Count within the affected area

1 Introduction

1.1 Background

Beca Limited (Beca) has been commissioned by May 1 Limited to prepare a Contaminated Soils Management Plan (CSMP) for the properties located at 105, 105A-109A, and 119 May Road, Mount Roskill, Auckland (the Site). The land to the northeast of the Site will be a shaft site for Watercare Services Limited (Watercare)'s Central Interceptor tunnel. To support the construction of Central Interceptor, Watercare is temporarily leasing 105 May Road Site from May 1 Limited for construction activities such as site offices, truck access, working platforms and stormwater management areas. Figure 1 presents Watercare's land, the Site and adjacent lots.

This report forms part of a suite of reports prepared to describe the future Site development and assess potential effects. The proposed works are described on Resource Consent Drawings (Beca, June 2022) and this CSMP has been informed by the Land Contamination Assessment (Beca, June 2022), the findings of which are summarised in Section 3. The Land Contamination Assessment comprised a desktop review of existing information for the 105 May Road property, and an intrusive site investigation for the 105A-109A and 119 May Road properties. This CSMP has been prepared for the 105A-109A and 119 May Road properties only.

Figure 1: Site Plan

1.2 Proposed Works

1.2.1 Overview of wider setting

The proposed works comprise earthworks across the majority of the Site in order to form platforms suitable for future development, to realign and naturalise an existing stream channel and to recontour floodplain areas within the Site to suit future developments and manage potential flood hazard effects. In addition to earthworks, the proposed works include landscape planting within floodplains and riparian margins and some modifications to public stormwater pipework to suit the final form.

Temporary earthworks associated with Watercare's Central Interceptor Project are already underway or due to be carried out soon on the adjacent Watercare land (54 Roma Road) and on 105 May Road as described in the sections below. This application covers the formation of the final landform on the Site once the Central Interceptor Project is constructed but not any interim earthworks on 105 May Road during its construction. Figure 2 shows cut-fill depths of the proposed bulk earthworks within the Site against that pre-development terrain.

1.2.2 Interim works on 105 May Road

Watercare is currently leasing part of the Site (105 May Road) until 2030 from May 1 Limited to facilitate construction of the Central Interceptor project. Watercare's contractors are currently in control of the area. Prior to the establishment of the final proposed works construction activities planned for the 105 May Road property include site offices, truck access, and earthworks to create working platforms and stormwater management areas. Watercare is responsible for any land distributing activities during the lease period including obtaining necessary consents and carrying out land contamination and geotechnical investigations.

Because of this, and because access is currently limited, no land contamination or geotechnical investigations for earthworks to on 105 May Road have been carried out specific to this application (although Watercare has shared information that they have gathered to date). Any remaining necessary investigations will be carried out at the end of the lease period when 105 May Road is returned.

1.2.3 Adjacent works on 54 Roma Road

Watercare holds a resource consent to form the permanent tunnel shaft access at 54 Roma Road northeast of the Site under an outline plan of works (OPW60341982). Construction is underway on this site with completion assumed to be before 2030 (that is, the end of the lease). We assume that the finished works proposed at the Watercare site following the completion of the Central Interceptor construction will return the ground levels to predevelopment levels at the boundary at the Site.

1.2.4 Site Specific Works

The bulk of works for this project is the establishment of a platform on 105A-109A, and 119 May Road for future commercial/industrial development. The total area of proposed works for the project is approximately 42,500 m^2. This involves the preparation of the site and importation of fill which will create a platform that slopes gently away from May Road. Refer to the Resource Consent Drawings (Beca, June 2022) for drawings of the proposed works. On the south-western boundary of the 105A-109A property there is an area of cut to reroute part of an existing public stormwater pipe and create an area for overland flow in high rainfall events. The site will be fully sealed upon completion of the works.

Buildings, areas of hardstanding and vegetated areas are currently present on the site. As part of the proposed works the existing buildings will be demolished and it is anticipated hardstanding (concrete) will be broken out and crushed for re-use or removed off site. Vegetation will be removed, and topsoil stripped to prior to filling works. Private services on the site will be removed or abandoned in-situ, with public services to be retained

and (in some cases) upgraded. It is anticipated that all cut material will be retained on site, with exact locations currently unknown.

A stream realignment is also proposed to re-route an intermittent watercourse that daylights from stormwater infrastructure in the west of the 105A-109A May Road site and joins a permanent waterway that runs along the site's north-eastern boundary. This flow path will be redirected around the northern extent of the fill platform on the 105 May Road site to meet a proposed stormwater connection at the sites northern corner.

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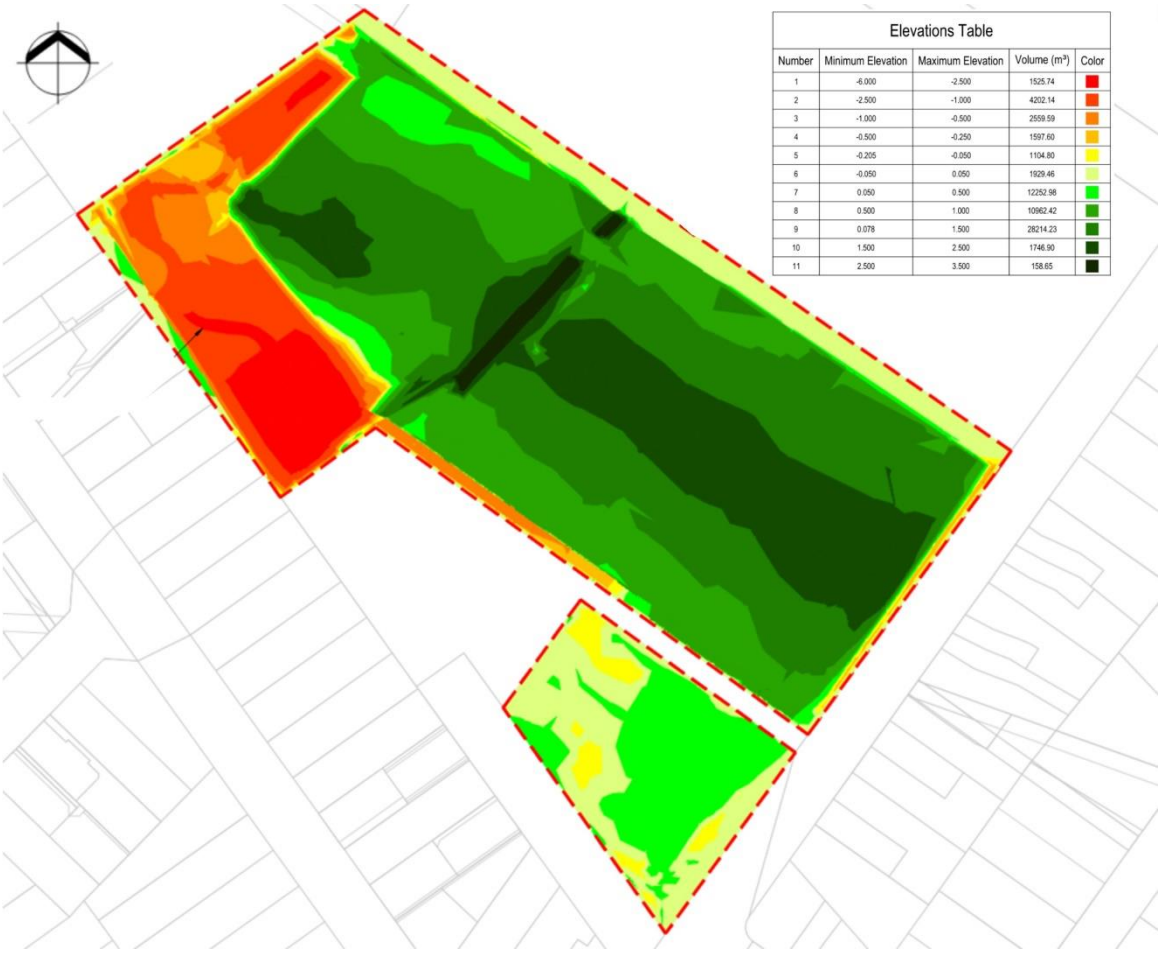

Figure 2. Earthworks Proposed Cut/Fill

1.3 CSMP Objective and Implementation

The objective of the CSMP is to develop a strategy for the management of the disturbance of soil to mitigate the potential risk posed by the identified contaminants during the works period at the 105A-109A and 119 May Road sites.

This CSMP has been prepared in general accordance with the following:

- Ministry for the Environment (MfE) Contaminated Land Management Guidelines No.1 (CLMG No.1) – Reporting on Contaminated Sites in New Zealand (2021) and MfE CLMG No.5 – Site Investigation and Analysis (2021) – NB, the site investigation used to inform this CSMP was undertaken prior to the release of the 2021 updated guidelines.

- Approved Code of Practice: Management and Removal of Asbestos (2016) (ACoP, 2016).
- BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil (2017) ('the GAMAS')
- National Chemicals Working Group of the Heads of the EPAs Australia and New Zealand PFAS National Environmental Management Plan- Version 2.0 (January 2020).

This CSMP has been prepared as a draft for Resource Consent and should be updated once further detail on construction methodology is known. Additional site investigation will also be required as discussed in Section 4.

This CSMP should be considered as a 'living document' that informs the contractor of procedures to manage ground disturbance activities. This document will be reviewed and amended as necessary during the site works to provide for mitigation of human health risks associated with asbestos contaminated soils, at this site.

Any amendments made to the CSMP are to be approved by the Beca Suitably Qualified and Experienced Practitioner (SQEP). The updates will be provided to the regulator prior to implementation of the change. This CSMP outlines procedures for the management of already identified contaminants and for the proposed design as set out to date. In the case of unexpected discovery (as discussed in Section 9) or modification to design, these procedures may need to be modified.

2 Site Description

2.1 Site Location and Area

The Site is located on May Road in the Auckland suburb of Mount Roskill and encompasses three land parcels (Figure 1):

- 105 May Road (Legal Description SEC 2 SO 4685230)
- 105A-109A May Road (Legal Description Lot 1 DP 586970
- 119 May Road (Legal Description Lot 3 DP 40979).

The Site is typically flat between elevations of 49 and 51 mRL.

2.2 Surrounding Land Uses

Surrounding land uses include:

- Commercial / industrial properties adjacent to the north-east boundary.
- Residential properties adjacent to the south-west and south-east boundaries.
- Watercare construction Site for the Central Interceptor project on the adjoining property to the north-west.

2.3 Summary of Hydrology, Geology and Hydrogeology

Published geological mapping indicates the Site is underlain by basalt lava. The East Coast Bays Formation of the Waitemata Group is likely to extend on to the south-western portion of the Site. A project specific geotechnical investigation was undertaken to better delineate the extent and thickness of the basalt flow; the findings of this investigation are reported[1] separately.

Groundwater levels monitored as part of this investigation indicate groundwater levels are at the shallowest approximately 0.5m bgl.

There are currently three main drainage pathways through the Site:

- A permanent watercourse (a tributary of Oakley Creek) runs along the north-western boundary of the Site.
- An intermittent watercourse flows along the south-western boundary of the 105 May Road Site from a public stormwater outlet at 33 Marion Avenue.
- An artificial watercourse that currently crosses the centre of the Site (along the boundary between 105 May Road and 105A-109A May Road) from a public stormwater outfall and flows into the permanent stream on the north-western boundary. This watercourse will be connected to a new stormwater manhole and outfall into the new channel constructed as part of the proposed works.

2.4 Sensitive Receptors

Surrounding sensitive receptors include:

- Residential properties located adjacent to the south-western and south-eastern boundaries of the Site. Adjacent along the north-eastern boundary are commercial properties.
- Three watercourses passing through the Site.
- Current Site users, including Watercare's Central Interceptor subcontractors on the 105 May Road property.

[1] Beca Ltd. June 2022. Geotechnical Interpretive Report, May Road Development

3 Contamination Status of Site Soils and Identified Hazards

3.1 Summary of Investigation Findings

3.1.1 105 May Road

The desk-based information review identified buildings were historically present along the south/south-western boundary observed in the 1940 aerial; several had been demolished by 1959 and all demolished by 1975. Since then, 105 May Road has been predominantly vegetated with the northern portion cleared and gravel laydown areas with tracks connecting the Site to 105A-109A May Road and off-Site to the west noted on multiple aerials. Auckland Council (AC) report they hold no records to suggest 105 May Road has been subject to HAIL activities.

105 May Road is currently being used by Watercare's contractor Ghella Abergeldie Joint Venture (GAJV) as a Site compound and laydown area. Due to this lease agreement no land contamination investigations for earthworks on 105 May Road have been carried out specific to this application although Watercare has shared information that they have gathered to date during investigations by Tonkin and Taylor (T&T) and Babingtons. The findings of these investigations identified:

- Varying depths of fill material across the Site. Babingtons considered it possible that uncontrolled filling and fly tipping had occurred at the Site in the past and that the extent of these materials may have been concealed by the undergrowth.
- Soil contamination (heavy metals, TPH and PAH) recorded above background soil concentrations in multiple samples.
- ACM fragments were observed in a stockpile by T&T and it was considered likely that asbestos would be present in the topsoil and fill on this part of the Site.
- Asbestos was also detected in soil, with several samples recording concentrations above human health guidelines.
- Additional observations by Babingtons noted an overland water channel on the north-eastern boundary and that the Site was prone to flooding events. Commentary was provided by Babingtons around previous sediment sampling that was undertaken at the overland flow path on the adjacent western Site. It was reported that asbestos was present in concentrations above the human health guidelines and considered likely that asbestos contaminated sediment could have been deposited at 105 May Road during flooding events.
- It was considered by Babingtons that 105 May Road was on a 'more likely than not' basis a HAIL Site due to past and current Site activities (HAIL I – related to uncontrolled historical filling).

Any necessary investigations to inform the earthworks for the construction of the final landform of 105 May Road will be carried out at the end of the Watercare lease period when the property is returned to May 1 Limited, as detailed in Section 4.3.

3.1.2 105A-109A May Road

The 105A-109A May Road Site was originally developed through the late 1950's to the 1970s. The Site was also historically used by Thermo Polycoatings LTD for 'plastic coatings of articles' and 'kitchenware non-stick coating applications'. The Site is currently used as a car yard and for timber pallet storage. Several stockpiles and general rubbish were also noted across the Site.

The contamination investigation comprised excavation of 18 test pits, installation of 8 boreholes for the collection of groundwater samples and collection of 3 surface water samples. The investigation findings are summarised:

- Fill material comprising gravel with cobbles, and traces of buried waste e.g. concrete, bricks, plastic, glass, metal and timber, was observed across the majority of the Site at depths between 0.1-1.1 m bgl.
- Several soil stockpiles are located across the Site, comprising brown clayey silt with gravel, cobbles and waste material. The waste material (glass fragments, brick, concrete, nails, wire, plastic, rubber tires and timber) was observed on the surface of the stockpile and litter was observed to be scattered across the Site.
- Asbestos (fibres and ACM fragments) was detected in four soil samples. The maximum concentrations of the asbestos as ACM was 0.03 % w/w and as fibrous asbestos / asbestos fines (FA/AF) was 0.005 % w/w, which are within the asbestos related works scenario.
- Three fragments of ACM were also identified.
- Three locations recorded concentrations of heavy metals above the background, environmental and / or human health guidelines: for lead and arsenic.
- Groundwater samples recorded concentrations of dissolved and total metals above the applied environmental criteria. Groundwater samples recovered from two boreholes recorded detectable concentrations of the PFAS compound PFOA, which is likely to be related to the historical kitchenware activity operating on the site prior to 1980.
- One surface water sample recorded a detectable concentration of the PFAS compound PFOS. The stream is a receiving environment for stormwater from the surrounding urban catchment therefore the source could be off-site and not related to the kitchenware coating operation however this has not been confirmed by this investigation.
- The recorded concentrations of the PFAS compounds in both groundwater and surface water were below the applied drinking water, environmental and interim trade waste disposal guidelines.

3.1.3 119 May Road

A warehouse structure was present from the early 1950's until it was demolished in 2006. Property file records indicate that a fuel oil Above Ground Storage Tank (AST) was present at the rear of the premises.

The soil investigation comprised the excavation of 15 test pits. The investigation findings are summarised:

- Fill material comprising silty clay with gravel, cobbles, and traces of buried waste e.g. concrete, bricks, plastic, ceramic, glass, metal and timber was encountered to a maximum depth of 0.8 m bgl.
- One soil sample recorded a chromium concentration above the human health and environmental guideline value. The elevated concentration is considered to be a localised exceedance within the fill material and is considered unlikely to present a significant risk to human health or the environment.
- Asbestos was detected in seven soil samples across six locations. A fragment of asbestos fibre cement was also identified at one of these locations. Three samples recorded concentrations of asbestos above the applied human health guideline.

3.2 Identified HAIL Areas

The following activities / land uses as listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) have been identified for the Site:

- E1 – Asbestos products manufacture or disposal including Sites with buildings containing asbestos products known to be in a deteriorate state.
- I – Any other land that has been subject to the intentional or accidental release of a hazardous substance in sufficient quantity that it could be a risk to human health or the environment.

Based on the assessment undertaken the extent of the HAIL is considered to be the entirety of each property.

3.3 Contaminants of Concern

The identified contaminants of concern are:

- Heavy metals (arsenic, cadmium, chromium, copper, mercury, lead, nickel and zinc)
- Polycyclic Aromatic Hydrocarbons (PAH)
- Total Petroleum Hydrocarbons (TPH)
- Asbestos
- Per & poly fluoroalkyl substances (PFAS)

3.4 Contamination Exposure Routes

Exposure pathways considered to be complete or potentially complete include;

- Dermal contact, ingestion or inhalation of dust by construction workers or future site users
- Migration of soil contaminants into surface water through shallow groundwater.
- Sediment and runoff directly into surface water.
- Migration of soil contaminants into surface water through shallow groundwater discharging into watercourses which ultimately discharge to Oakley Creek.
- Contamination within surface water from off-site sources migrating into on-site surface water courses and / or groundwater.

3.5 Asbestos in Soils Management

Soil disturbance at 105A-109A May Road and 119 May Road should be undertaken as **asbestos related works**, under the requirements of the NZ asbestos in soils guidelines. Asbestos was also detected in the T&T and Babingtons investigations at the 105 May Road site. As detailed in Section 4.3, the appropriateness of the asbestos related works procedures for the proposed final land forming works at 105 May Road will be assessed when the site is returned to May 1 Limited. Asbestos related works does not require the works to be undertaken by a licensed asbestos contractor or for the works to be notified to WorkSafe New Zealand. However, the contractor undertaking the works should be aware of the risks relating to asbestos and how to manage them, for example, having completed asbestos awareness training. This CSMP includes the required asbestos in soils management protocols.

As per the asbestos ACoP (Part D, Section 19), the works will become licensed asbestos removal works if;

- The WorkSafe NZ trace level (0.01 fibres / mL) is exceeded.
- More than 10 m2 of soil is being removed.
- If ACD is associated with the removal.
- If the removal does not contain ‘minor contamination.’

4 Requirements for Further Investigation

4.1 PFAS

The findings of the contamination investigation indicate that PFAS contamination is not widespread across the Site. Within groundwater only one PFAS compound (PFOA) was detected in two groundwater samples recovered from boreholes BH202 and BH207, both located in the south-west of the Site. The concentrations recorded were within the same order of magnitude (0.039 µg/l (BH207) – 0.060 µg/l (BH202)) and below the applied human health, ecological and interim trade waste guidelines. No other PFAS compounds in the analysis suite were detected in groundwater.

Based on the investigation results there is a possibility there is a soil PFAS source area that is resulting in ongoing input into groundwater, likely located within the south-west corner of the Site, based on the locations of PFOA detections in groundwater. Figure 3 presents a plan indicating an area where potential PFAS impacted soil is more likely.

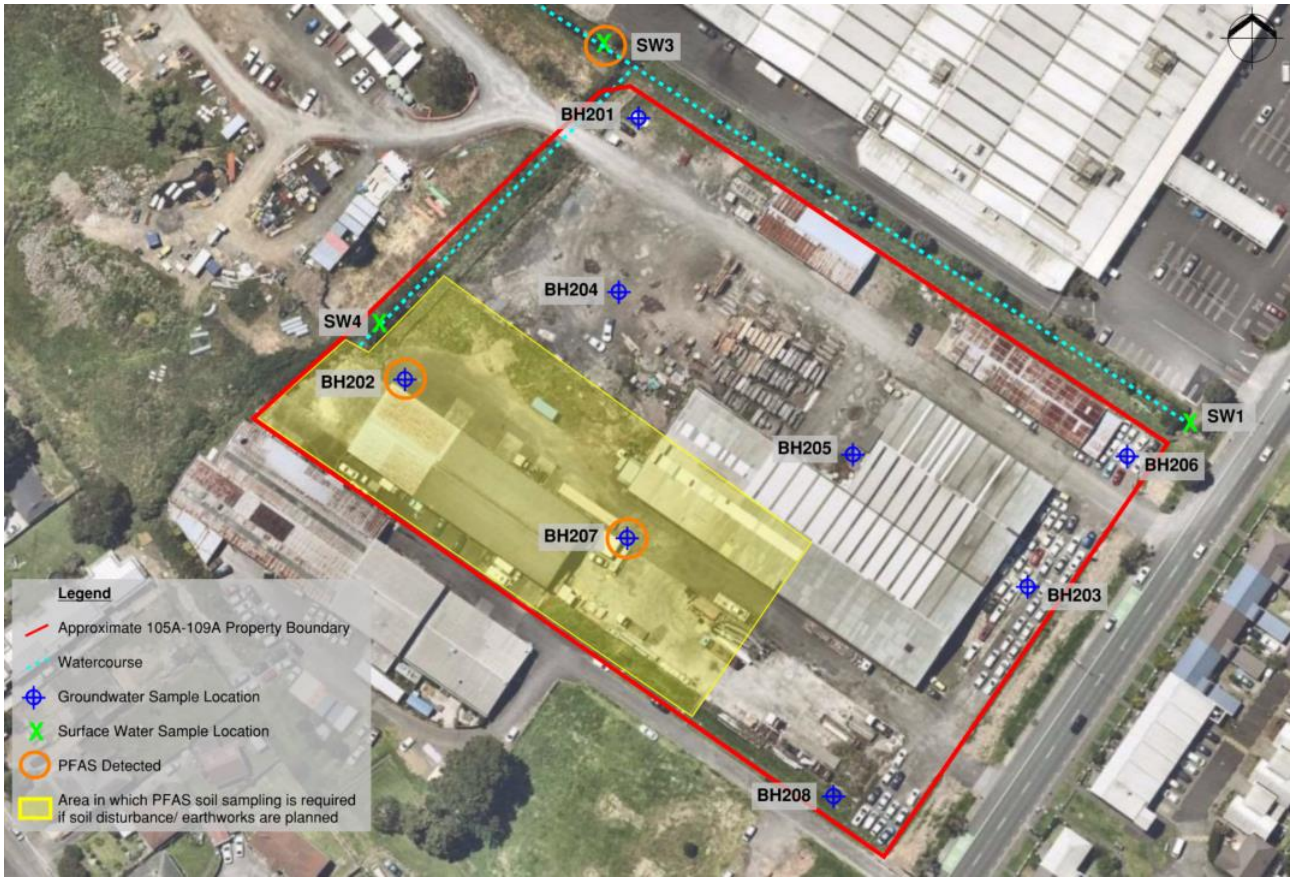

Figure 3: Plan illustrating the area of Site in which PFAS soil sampling is required if future earthworks/ soil disturbance is proposed (Image Source: Nearmap Australia Pty Ltd)

Based on the proposed cut/fill plan (

Figure 2), earthworks in this area are proposed to comprise some cut in order to realign a public stormwater pipe outfall and regrade the surface levels to provide overland flow path in high rain events. Following completion of the earthworks (cut) it is understood that the Site will be fully sealed.

Soil sampling in this area for PFAS was not undertaken. It is likely (although not certain) that the cut earthworks in this part of the site will not occur until Watercare's contractors have vacated 105 May Road (expected to be 2030) and the stream diversion is established through 105 May Road. As PFAS is an emerging contaminant, there is on-going research within the scientific community in the understanding on these compounds, the risks they pose and how to manage the effects. Acceptance of PFAS impacted materials within New Zealand landfills is also being assessed and updated. Due to the changes in industry practice related to this contaminant, an investigation of the presence of PFAS in soils at the site is proposed to be undertaken prior to commencement of earthworks and post removal of structures. This will enable the assessment to be undertaken using the most up to date scientific guidelines (as well as more detailed design). The proposed investigation will be undertaken by a Suitably Qualified and Experienced Practitioner (SQEP) in line with the:

- MfE Contaminated Land Management Guidelines No. 2 Hierarchy and Application in New Zealand of Environmental Guideline Values (Revised 2011), and,
- National Chemicals Working Group of the Heads of the EPAs Australia and New Zealand PFAS National Environmental Management Plan- Version 2.0 (January 2020)
- Or any future updates or revisions of these guidelines.

Section 8 presents the proposed management options for PFAS impacted material based on current guidelines.

4.2 Works within the Streams

Sampling of sediment or water quality of the watercourses located on the north-eastern boundary and crossing the Site between the 105 and 105A-109A properties was not undertaken as part of the investigation.

Where works are proposed within the streams as part of the proposed development (e.g. construction of new stormwater outlets, riparian planting,) further assessment to inform management or disposal of the material (water or sediment) will be undertaken by a Suitably Qualified and Experienced Practitioner (SQEP) in line with the Contaminated Land Management Guidelines. This CSMP provides indicative management procedures for the management and handling of contaminated water / sediment. If, following the additional investigation additional procedures are required, this CSMP will be updated.

4.3 105 May Road

Watercare is currently leasing part of the Site (105 May Road) until 2030 from May 1 Limited to facilitate construction of the Central Interceptor project. Watercare's contractors are currently in control of the area. Prior to the establishment of the final proposed works, construction activities planned for the 105 May Road property include site offices, truck access, and earthworks to create working platforms and stormwater management areas. Watercare is responsible for any land distributing activities during the lease period including obtaining necessary consents and carrying out land contamination investigations. Because of this, and because access is currently limited, no land contamination investigations for earthworks to on 105 May Road have been carried out specific to the proposed earthworks detailed in this application (although Watercare has shared information that they have gathered to date).

Further assessment will be carried out at the end of the lease period when 105 May Road is returned. This will comprise:

- Review of the existing and any future land contamination reports provided by Watercare.
- Review of the final ground elevations (including material removed) and status of the site (e.g. capping layers) in relation to the proposed earthworks to create the final landform.
- confirm the appropriateness of the management procedures set out in this CSMP and, If required, further additional contaminated land investigation undertaken by a SQEP to assess the risks..

If, following the additional investigation further procedures are required, this CSMP will be updated by the SQEP.

5 General Management Procedures

This CSMP applies to the proposed earthworks as described in **Section 1.** This CSMP provides information and recommendations to minimise risk to human health and the environment that may be posed by the works. The CSMP is a live document and is required to be updated to adapt to any modifications to the original scope of works.

This section sets out general management procedures and requirements.

1. It is recommended that implementation of this CSMP is contractually enforced throughout the duration of the site construction works.
2. All personnel involved in the site construction works are to be familiar with this CSMP and ensure that the requirements of this CSMP have been followed.
3. A copy of this CSMP is to remain available onsite at all times so that reference can be made to it when undertaking any site works.
4. The CSMP is intended to assist the site Contractor in meeting their legal obligations related to potentially contaminated soils with respect to health, safety and the environment. It is not intended to cover the general site safety procedures required for typical excavation and construction activities at the site. The CSMP is not intended to relieve the Contractor of their legal responsibilities.
5. Excavation, demolition and construction activities at the site may be subject to other controls/rules/policies under the relevant district and regional plans, including but not limited to, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 and Auckland Unitary Plan (AUP). Any conditions imposed by the regulatory authorities must be adhered to. However, it is expected that this CSMP will be incorporated into any consent/permit involving excavation/disturbance work at the site to ensure the risks associated with contaminated soils are managed appropriately.
6. Overall responsibility for the implementation of this CSMP shall be held by May 1 Limited. However, the specific requirements and provisions of the management plan will be under the control of the site Contractor.

5.1 Roles and Responsibilities

This CSMP shall be implemented and managed by the relevant responsible parties. The contact details within **Table 1** are required to be filled out prior to works commencing.

Table 1: Roles and Responsibilities

Role	Responsibility
Client Company: Name: Contact Details:	• Responsible for overseeing approval and implementation of this CSMP.

Role	Responsibility
Lead Contractor Company: Name: Contact Details:	• The construction manager of the lead contractor shall be responsible for ensuring works are undertaken in accordance with requirements of the CSMP and other relevant plans/documentation. • Inform Auckland Council, as required, relating to contamination incidents. • Implementation of air monitoring if any visible dust is generated.
Site Supervisor Company: Name: Contact Details:	• The site supervisor must read, understand and implement the CSMP in the field and ensure site workers comply with this management plan. • The site supervisor shall ensure all workers are inducted, wear appropriate personal protective equipment and follow basic hygiene procedures and be aware of the symptoms of contamination toxicity and health risks. • The site supervisor shall monitor for signs of contamination (using an excavation spotter if deemed necessary) and manage the implementation of control measures and safety precautions. • Verbally report to the construction manager regarding incidents relating to presence of contamination.
Design Manager Company: Name: Contact Details:	• Responsible for design queries during construction.
Contaminated Land Specialist Company: Name: Contact Details:	• The Contaminated Land Specialist will be overseen by a Suitably Qualified and Experienced Practitioner (SQEP) and shall be responsible for provision of ground contamination advice and site validation reporting on conclusion of the works. • The Contaminated Land Specialist will be available to attend site and provide advice if unexpected contamination is encountered during the works.

6 Site Management

6.1 Pre-development Site Set-up

A site meeting shall be held and attended by the Client, the Contractor and any other personnel involved with the earthworks (e.g. sub-Contractors, if any) to discuss the risks and site procedures for handling contaminated soils. The Contractor shall prepare a site-specific Contractor's Health & Safety Plan (CHSP) for the works which shall cover potential exposure to contaminated soil.

Procedures relating to the management of noise, dust, stormwater, stockpiling and the site working hours shall be detailed in the Contractor's Construction Management Plan (CMP) and shall be implemented by the Contractor. All procedures shall comply with the relevant Council bylaws and conditions of applicable consents. At minimum, procedures in the CMP that relate to the management of dust, sediment, stormwater and stockpiling shall be implemented by the Contractor in order to appropriately manage contaminated soils or potentially contaminated soils at all times.

6.2 Contractor Training

Prior to the commencement of excavation works the contractor and all personnel involved with soil disturbance works should complete asbestos awareness training. Any personnel handling asbestos containing soil must have the appropriate training and experience for identifying and handling asbestos materials and of the required decontamination procedures.

At the start of each day a 'tool-box' talk should be held by the contractor who will outline the works proposed for the day to the personnel working on the spoil removal.

Refer to Part D of the ACOP for further information on managing asbestos in the ground.

6.3 Exclusion Zones

Whilst earthworks are being undertaken, signs and barriers must be erected around the area of works to warn of the danger and to prevent unauthorised entry. An exclusion zone should be set up with barriers and signage placed a minimum of 5 metres from the works area where practicable. All barriers and warning signs shall remain in place until all earthworks have been completed. The extent of control areas will be set with the objective of preventing unacceptable exposures to personnel working outside of the exclusion zone.

6.4 General Site Monitoring

The following site monitoring activities should take place as a minimum whilst disturbance of contaminated soil is being undertaken:

- Daily – The Site Supervisor should conduct informal inspections to check compliance with this CSMP and note any issues to be rectified.
- Daily – Checking of weather forecast for wet and windy conditions, and any pre and post storm inspections as required.
- Daily – Ensuring that dust control measures are implemented
- Weekly – Formal site inspections are to be completed by the Site Supervisor to check compliance with this CSMP. Site specific checklists will be developed by the Contractor to check compliance. Issues will be noted if they present significant environmental risks (e.g. noise, dust, spoil management).
- Inspections as required by environmental control procedures e.g. sediment control devices inspected to ensure that they are installed correctly, operating effectively and are properly maintained.
- The Site Supervisor should ensure that a spill kit is available onsite, and that the Contractor's staff are suitably trained in its use; and

- All machine operators / drivers should ensure all machinery is free of oil leaks prior to use.

Triggered inspections will be undertaken and recorded in response to the following:

- Complaints – upon receiving a complaint, the complaint should be noted, and an inspection of the area affected or involved undertaken;
- Extreme weather – site control measures will be inspected immediately before, during and after extreme weather (as appropriate); and
- Post incident inspections will be undertaken immediately following accidental spills or other incidents or emergencies and after “near miss” events.

6.5 Dust Suppression and Watering Systems

The inhalation of dust and asbestos fibres during works is a potential hazard to construction workers and the general public in surrounding areas. Contaminated dust can be generated if dust generating activities are not adequately managed. The most effective way to control construction site dust is through good on-site housekeeping and mitigation measures including:

- Timing of works to take account of the prevalent wind direction.
- Reduction of vehicle speeds on site.
- Minimising drop heights from loaders.
- Ensuring soil is covered when being transported by truck if required.
- Limiting access to the working area to essential vehicles and personnel only.
- Trucks and excavators entering the work area can have their wheels, tracks or buckets scraped washed or brushed down prior to leaving the work area if required.
- Keep windows / doors on excavators and trucks closed when in the exclusion zone.
- Keep windows / doors on excavators and trucks closed.
- Where windy conditions persist and potential for dust generation is present; the use of light sprays to dampen the immediate excavation surfaces should be employed. Excessive wetting causing run-off or ponding of water should be avoided.
- Consideration should be given to dampening and/or covering soil stockpiles, if required.
- Minimise the time soil is exposed by backfilling or cover exposed soil.
- Erection of temporary fencing with filter fabric to mitigate the risk of any dust being blown out to of the area of works; where required.
- The Contractor should at all times control any dust from the site in accordance with the Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions, MfE (2001).

The following hierarchy of actions is proposed in the event that dust discharges occur from the works:

- The wearing of dust masks shall be implemented in the event that visible dust is generated. If dusts are discharging beyond the boundary of the work area the following actions shall be implemented immediately:
  - Increase wetting of the exposed materials until discharges are mitigated. Consider employing automated suppression systems if problems are recurring.
  - Cover or temporarily backfill excavations to address discharges while alternative mitigation measures are implemented. Alternative mitigation measures may start with revising operational procedures, for example, significantly reducing open areas in conjunction with the controls described above. However, if the discharges persist, professional advice should be sought in order to define appropriate control measures.
  - Work will cease if unacceptable levels of dust are generated or observed.

If significant amounts of dust are being generated control air monitoring (see Section 6.6) should be employed.

6.6 Control Air Monitoring

Control air monitoring is not a requirement within the guidelines for asbestos related works, however it can be determined to be required at the discretion of the SQEP. Due to the location of the works (surrounding residential properties) and close proximity to other site users air monitoring is required if visible dust generation is noted on site and cannot be rectified by the site contractor through standard practice (included in Section 6.5).

Air monitoring may also be required if unexpected contamination is discovered (e.g. significant quantities of friable asbestos). Refer to Section 9 for unexpected discovery procedures.

The contractor should have the ability to undertake air quality monitoring in the event that visible dust generation is noted. Air monitoring typically comprises the installation of four air monitors evenly spaced on the exclusion zone fencing, placed at head height with filters facing towards the works and angled at roughly 45 degrees from vertical. The contractor should prearrange the monitoring on standby under the assumption that all works may need to stop pending sampling if any dust is observed.

Refer to Part A: Section 5 of the ACOP for further information on air monitoring.

6.7 Erosion and Sediment Control (ESC)

Erosion and sediment controls shall be installed by the Contractor prior to excavation works in line with the project Erosion Sediment Control Plan (Beca, June 2022).

6.8 Stormwater Control Procedures

Stormwater runoff should preferentially be maintained onsite and allowed to infiltrate wherever possible to reduce the volume of water and material discharged. Cesspit protection measures such as filter socks and sandbags should be used to trap any sediment from collected runoff. Sediment captured from the excavation of potentially contaminated material shall be managed in the same manner as soils requiring off-site disposal, as described in Section 6.11.

All diversion bunds (if required) shall be designed and constructed to accommodate and divert the overland flow and stormwater around live construction zones and also prevent sediment-laden water from leaving the works area.

If disposal to the stormwater network is not possible, then accumulated stormwater should be disposed of to an appropriate facility via tanker.

6.9 Groundwater Management Procedures

Groundwater level monitoring recorded groundwater levels at between 0.54 m and 1.46 m bgl, with a flow direction to the north-west. If groundwater is encountered during the excavation works, the Contractor shall:

- Contain groundwater within the excavation and not allow it to discharge across the site surface;
- If dewatering is required, the pumped groundwater discharge shall be diverted into a retention tank. The groundwater may be disposed to stormwater only if laboratory testing of water indicates it is appropriate to do so and this has been agreed with the appropriate operator. Sampling must be undertaken by a suitably qualified environmental scientist/engineer; and
- If dewatering is required, the pumped groundwater discharge could be discharged to reticulated wastewater system with prior approval.

If unexpected groundwater contamination (refer to Section 9) for indicators of potential contamination) is encountered the following controls shall be implemented:

- The area in which unexpected contamination conditions have been encountered shall be isolated so that stormwater from this area can be separated from that generated across the wider site; and

- If dewatering is required, the effluent should be contained for testing prior to disposal.

As detailed in Section 4, further assessment of the presence of PFAS in groundwater will be undertaken prior to works commencing. Additional procedures for managing and disposing of PFAS impacted groundwater may be required, and this CSMP will be updated.

6.10 Removal of Surface Waste and Asbestos Containing Material

Prior to undertaking earthworks, a site inspection of the area to be excavated should be undertaken. During this inspection, any waste material and potential ACM fragments are to be removed by hand from the ground surface by a suitably trained and qualified worker. The ACM cement fragments should be bagged, sealed and disposed of appropriately.

6.11 Earthworking of Contaminated Soil

The following procedures should be followed for any earthworks associated with the project:

- No excavation shall be undertaken without due consideration of the potential for presence of site services.
- Assess the removal area to establish the appropriate controls for the protection of health, safety, and environment.
- Appropriate PPE and RPE must be worn as outlined in Section 7.
- Personnel operating machinery involved in excavations, stockpiling, and transferral of fill must adhere to requirements within this plan.

6.11.1 Stockpiling

Earthworks methodologies have not been confirmed. If any localised stockpiling of contaminated materials is required, the following procedures should be employed:

- Asbestos contaminated soils must be placed in a fenced area and warning signs erected, where applicable.
- Stockpiles shall be maintained at a low level (no more than 2 m in height).
- Stockpiles shall not be placed in an area where water and sediment runoff cannot be controlled.
- Asbestos contaminated soil stockpiles shall be placed on sheeting or similar to prevent contamination of underlying clean material. Care must be taken to ensure that the integrity of the sheeting is not damaged during handling or transportation.
- The stockpiled material shall be covered with geotextile or a polythene cover to prevent rainfall or wind induced erosion and dust.
- All plastic or material used to isolate stockpiles must be disposed of as asbestos containing waste.

6.11.2 Transport and Disposal of Soils

Controlled wetting of material during excavation shall be employed where practicable, to reduce dust emission. Excessive water logging shall be avoided as the excess contaminated water may leak and create a future source of airborne asbestos fibres. Wagons should be covered prior to transport to reduce the potential for fibre generation during transport. The requirements for truck lining or wrapping is dependent upon the requirements of the receiving landfill.

Based on the laboratory results date, material is likely to require disposal as managed fill or contaminated fill, however this should be confirmed by the receiving landfill. Landfill acceptance of excavated materials shall be obtained prior to works commencing. The excavated material shall be disposed of at an appropriate waste facility authorised by the Resource Management Act 1991 to accept such waste and where a certificate of disposal shall be issued. The certificate of disposal will include the name of the authorised waste facility, weighbridge docket and registration number of vehicles for every disposal. Copies of waste disposal certificates and related documentation must be kept by the Contractor and supplied to May 1 Limited.

6.11.3 Re-Use of Soils

Soil generated during the land disturbance activities may be re-used at the Site if geotechnically suitable and appropriately managed and / or capped as agreed by the contaminated land Suitably Qualified and Experienced Practitioner (SQEP). Where the materials are not considered to be suitable for re-use, spoil materials should be disposed of off-site to a facility authorised to accept such materials.

6.12 Imported Material

Should imported material be used at site for the purposes of filling, it should be certified cleanfill. Records must be provided by the Contractor to demonstrate that any imported material is obtained from a quarry or other certified source. Material shall not be imported from any site that is, or would be considered, a Hazardous Activities and Industries List (HAIL) site (MfE, 2011). If the material is not cleanfill but determined by a suitably qualified environmental scientist/engineer to be suitable for the intended land use and is acceptable to the client, further consenting may be required to authorise.

Cleanfill is defined by the Auckland Unitary Plan as:

Cleanfill material:

Means natural material such as clay, gravel, sand, soil and rock which has been excavated or quarried from areas that are not contaminated with manufactured chemicals or chemical residues as a result of industrial, commercial, mining or agricultural activities. Excludes:

- *Hazardous substances and material (such as municipal solid waste) likely to create leachate by means of biological breakdown;*
- *Product and materials derived from hazardous waste treatment, stabilisation and disposal practices;*
- *Materials such as medical and veterinary waste, asbestos, and radioactive substances;*
- *Soil and fill material which contain any trace element specified in table e30.6.1.4.2 at a concentration greater than the background concentration in Auckland soils specified;*
- *Sulfidic ores and soils;*
- *Combustible components;*
- *More than 5% by volume of inert manufactured materials (e.g. Concrete, brick, tiles); and*
- *More than 2% by volume of attached biodegradable material (e.g. Vegetation).*

6.13 Clearance Inspection

There is no requirement in the Health and Safety at Work (Asbestos) Regulations (2016) for a visual inspection to be undertaken by a Licensed Asbestos Assessor or Competent Person for ‘asbestos related works’. As the proposed works do not comprise full remediation of the site and contamination will be left in-situ validation sampling is not considered to be required.

6.14 Long Term Management

The soil disturbance works and removal to be undertaken are to enable facilitation of the project, not to remediate the site of all potentially asbestos contaminated soil. Upon completion of the soil disturbance and construction works engineering controls will be required to manage the long-term risk of any remaining soil contamination.

The PCBU with management or control of the workplace must ensure that a written plan is prepared (to form part of a site-wide ongoing asbestos management plan) to manage the risk posed by residual asbestos potentially remaining at the site. This can be prepared by the SQEP to control future activities where remaining asbestos and other residual contaminants exist in soils that do not require immediate remedial action.

7 Health and Safety

7.1 Personnel Protective Equipment (PPE)

Prior to works commencing, the Contractor shall ensure that the necessary PPE is available and that all relevant personnel are familiar with its application, use and maintenance.

Given the land use activities that have occurred at the site, there is the potential to encounter contaminated soils and/or groundwater as part of the proposed site works. Prior to work being undertaken, a Job Safety and Environment Analysis (JSEA) will be carried out by the Contractor that will identify the appropriate PPE and behaviours to reduce the exposure risk. Note the contaminants identified at this site to date, are considered to pose a low health risk to construction workers. Unexpected contamination may be identified that will increase this risk.

Workers may be exposed to contaminants via the inhalation, accidental ingestion of, or skin contact with soil and/or groundwater and/or surface water. To prevent this exposure standard good practice earthworks procedures should be followed by workers who are likely to come into direct contact with contaminated soil and/or water, including the following:

- Safety boots (steel toe capped gumboots or safety footwear with disposable overshoes).
- Appropriate disposable coveralls.
- Protective gloves for workers handling ACM or soil potentially containing ACM.
- Safety glasses.
- Appropriate particulate filter respirators (minimum disposable P2 dust masks). The selected respirator must comply with AS/NZS 1716 Respiratory protective devices. The appropriate mask required should be selected in accordance with AS/NZS 1715, use and maintenance of respiratory protective equipment.
- All staff physically involved in works likely to result in hand contact with soil should wear gloves.

Further hazards may be identified during the course of the works. The Contractor is responsible for reviewing any new work element and assessing whether there are any new associated hazards, and whether these can be eliminated, isolated or minimised. The Contractor shall then instruct all staff on the health and safety procedures associated with the new hazard and update the site CHSP.

Refer to Part C: Section 14 of the ACOP for further information on PPE/ RPE requirements.

7.2 Personnel Behaviours

All workers who are likely to come into direct contact with contaminated soil and/or water, should;

- Minimise hand to mouth contact;
- Wash hands and face prior to eating, drinking or smoking;
- No eating or drinking within the excavation area;
- Wash any skin abrasions immediately and treat to prevent infections; and
- Follow any additional requirements in the Contractor (Site Specific) Health and Safety Plan.

7.3 Decontamination

7.3.1 Personal Decontamination

Prior to work commencing, a decontamination area will be identified upwind of the excavation area. Items available in this area should include but not be limited to:

- Labelled asbestos waste bags (with a thickness of 200µm);

- Water spray bottle;
- ‘Wet wipes’/Alcohol wipes; and
- Spare suits, boot covers, and gloves.

Personal decontamination should be undertaken as outlined in the ACoP. All disposable PPE used during removal works are to be considered asbestos containing waste and are to be disposed of appropriately.

7.3.2 Equipment Decontamination

All handheld items and equipment (e.g. spades) used during earthworks which have come in contact with potentially asbestos contaminated soils must be;

- Decontaminated using wet or dry decontamination methods as outlined in the ACoP (i.e. fully dismantled, and cleaned under controlled conditions); or
- Placed in sealed containers (and only used for asbestos removal work); or
- Disposed of as asbestos waste.

Plant and machinery used during earthworks should have all visible soil removed and a visual assessment undertaken prior to demobilisation from site.

8 Management of PFAS Impacted Soil

Additional investigation will be undertaken in the area identified on Figure 3 where there is potential for PFAS to be present in soil. If PFAS is detected, the following section presents the proposed management procedures based on current guidelines, with the procedures subject to change if guidelines/ regulations change in the future.

8.1 Excavation Procedures

- In areas where PFAS in soil is discovered, the size and extent of the open excavation areas will be limited to provide additional confidence of runoff prevention.
- Daily inspections of sediment control devices will be undertaken.
- Additional PPE (eg coveralls, safety glasses, gloves) and dust control measures will be implemented dependent on the recorded concentration.

8.2 Material Re-Use

- At the present point in time no off-site disposal locations are available and therefore it will be the intention of the project to retain all PFAS impacted soils on-site.
- Where concentrations warrant, soils will be stabilised or treated.
- Treated / stabilised soils will placed above the mean water table and below an area of hardstand.
- The location will be recorded, and future management requirements identified.

9 Unexpected Contamination Discovery

The procedures outlined below provide the Contractor with protocols to identify potential contamination if unexpected, contaminated soils or hazardous materials are discovered during the excavation works. These protocols will enable the appropriate action to avoid exposure of contaminants to site workers or the dispersion of contaminants into the surrounding environment.

9.1 Contamination Indicators

Contamination indicators or hazardous materials may include but are not limited to:

- Any visible suspected Asbestos Containing Material (ACM) or friable asbestos
- Unusual odours
- Discoloured or stained water seepage and soils
- Petroleum hydrocarbon contaminated soil, visual sheens and/or free product
- Liquid waste, putrescible waste, household refuse and any material that normally would be sent to a licensed landfill
- Intact or broken drums and containers.

9.2 Unexpected Contamination Discovery Management Actions

During the earthworks on site, the Contractor shall actively monitor for the conditions/materials specified above. In the event that one of these is identified, the Contractor should take the following actions:

- Stop all earthworks within a 5m radius of the area where the suspected material/ emission/ discharge has been recorded
- Immediately notify the site supervisor
- Cordon off the area as practicable with a suitable barrier
- Work shall not resume or commence within a 5 m radius of the area unless authorised by the Engineer's Representative.

The site supervisor shall contact the Project Manager who will consult with the SQEP and advise on the appropriate course of action. The SQEP shall:

- Notify the regulatory authorities that contamination has been discovered and contingency action is being implemented.
- The SQEP will characterise the contamination by collecting samples for chemical laboratory analysis, if required.
- When the material characteristics have been established, The SQEP will advise the site supervisor as to whether the materials may remain on site or what remedial measures are required to manage this material on-site, or the options available to disposal of this material off-site.
- Instruct relevant staff so that all appropriate information such as location and quantity of material and off-site weighbridge dockets are recorded.

10 Limitations

This report has been prepared by Beca Ltd (Beca) solely for May 1 Limited (Client). Beca has been requested by the Client to provide a Contaminated Land Management Plan. This report is prepared solely for the purpose of managing contaminated soils during the redevelopment of the site located at 105, 105A-109A, and 119 May Road, Mount Roskill, Auckland (Scope). The contents of this report may not be used by the Client for any purpose other than in accordance with the stated Scope.

This CSMP was based on the findings of a Land Contamination Assessment prepared by Beca. The Land Contamination Assessment was prepared based on the design at the time. Should the design differ, then further investigation may be required and this CSMP will need to be updated accordingly.

This report is confidential and is prepared solely for the Client. Beca accepts no liability to any other person for their use of or reliance on this report, and any such use or reliance will be solely at their own risk.

This report contains information obtained by inspection, sampling, testing or other means of investigation. Unless specifically stated otherwise in this report, Beca has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, the Client or any third party, including the information listed above, and has not independently verified the information provided. Beca accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the information provided. Publicly available records are frequently inaccurate or incomplete.

The contents of this report are based upon our understanding and interpretation of current legislation and guidelines (“Standards”) as consulting professionals and should not be construed as legal opinions or advice. Unless special arrangements are made, this report will not be updated to take account of subsequent changes to any such Standards.

This report should be read in full, having regard to all stated assumptions, limitations and disclaimers.