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Dear Hinsan

REMEDIAL ACTION PLAN AND CONTAMINATED SITE MANAGEMENT PLAN – REMUERA PRECINCT, 79 LADIES MILE, REMUERA, AUCKLAND

1.0 Introduction

Pattle Delamore Partners Limited (PDP) has been engaged by the Fletcher Residential Limited (FRL) to prepare a Remedial Action Plan (RAP) and Contaminated Site Management Plan (CSMP) to support the residential development of the Remuera Precinct area (the site), including the contaminated land management resource consents. The Remuera Precinct development area is located at the eastern end of the Ellerslie Racecourse – located at 79 Ladies Mile, Remuera, Auckland. FRL have purchased approximately 6.2 hectares of land located at the eastern end of the Ellerslie Racecourse site from Auckland Thoroughbred Racing and has obtained resource consent (through the fast track process) to construct approximately 357 residential dwellings. A plan change is now proposed to recognise the consented residential development within the Remuera Precinct, and a Private Plan Change application is being lodged.

PDP understands that FRL proposes to develop the site for a mixture of residential zone purposes. Soil disturbance works (including some soil removal), sub-division, and change in land use activities, are all required as part of the proposed development works (refer to FRL development plans provided as part of the Private Plan Change application process). As a result of reported concentrations of contaminants identified within the site being above Auckland Region background ranges (and due to the expected earthworks volumes related to the development), the site is expected to be a Permitted Activity under the *Auckland Unitary Plan – Operative in Part* (under Rule E30), and a Controlled Activity under Regulation 9 (1) and (3) for consent under the *Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations* (the NES-CS (NES-CS, 2011)). This comes with the expectation that removal of a small area of impacted soils surrounding the Track Manager's House (the soil halo) is removed as a Permitted Activity under the NES-CS. As such, this RAP and CSMP has been prepared to support the safe management, disturbance, and removal of soil/fill material during the proposed works.

This RAP/CSMP sets out the required controls to achieve this management and has been overseen and reviewed by a Certified Environmental Practitioner – Site Contamination speciality (CEnvP – SC) and has been undertaken in accordance with the Ministry for the Environment (MfE) *Contaminated Land Management Guidelines No.1 – Reporting on Contaminated Sites in New Zealand* (MfE, 2021a), and the *BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil* (BRANZ, 2017).

It is noted that this report was originally prepared by PDP for FRL to support the fast track consent applications lodged for the site. In earlier iterations of this report the development area was referred to as “The Hill”, which was the name given to the development area covered by the report at the time. Since then, and specifically as it relates to the current Private Plan Change application, the name of the development area has been changed to “the Remuera Precinct”. PDP confirms that this report, as it was prepared for “The Hill” site, applies to the same area as is relevant for the Remuera Precinct. The two areas are analogous, except the Remuera Precinct is 62,000 m² in area whereas The Hill site was 64,000 m². PDP confirms that this report is suitable and sufficient for use by FRL in support of the Private Plan Change application.

2.0 Investigation Background

2.1 PDP Ground Contamination Investigations

PDP has previously completed a combined Preliminary and Detailed Site Investigation (PSI/DSI) for the site which was originally issued in 2021, and which has now been reissued in support of the Private Plan Change application (*‘Preliminary and Detailed Site Investigation – Remuera Precinct – 79 Ladies Mile, Remuera, Auckland’* (PDP, 2023)). The PSI/DSI was carried out to determine if any current or historic activities have been undertaken at the site that could potentially have resulted in the presence of contamination; in particular, any potential uses or activities captured by the MfE Hazardous Activity and Industry List (HAIL)¹.

The PSI identified several HAIL land-uses which had the potential to result in ground contamination at the site, including:

- ✦ Uncertified fill areas across the site including excavated pond dredgings in the central northern part of the site;
- ✦ An area of the site which has formerly been used as a nursery/market garden;
- ✦ Impacted ground resulting from lead-based paint application on the exterior walls of the Track Manager’s House.

The results of soil/fill sampling to further investigate these actual or potential impacts was completed during the DSI and confirmed:

- ✦ Lead-impacted-surface-soil with concentrations of lead above environmental and human health guideline values, were present surrounding the current Track Manager’s House in the north-eastern area of the site.
- ✦ Fill material including asbestos containing material (ACM) was also encountered during the advancement of one test pit in the central north-western part of the site. No asbestos was detected in associated soil samples and therefore soil in this location did not exceed human health guideline values (from the *BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil, 2017*).

¹ The HAIL is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.

- ∴ Various soil sampling results from the remainder of the site with contaminant concentrations above background ranges for the Auckland Region.

Based on various soil sample results complying with the AUP-OP Permitted Activity criteria, the proposed soil disturbance and remediation works can be completed as a Permitted under Rule E30 of the AUP-OP.

However, based on the presence of HAIL land-use confirmed as 'more likely than not' for the site, and given that soil disturbance is required within the 'piece of land'², it has been determined that the regulatory framework of the NES-CS will also apply to the site and proposed activities³. The category of this consent is also expected to be a Controlled Activity consent, with local soil remediation surrounding the Track Manager's House being carried out as a Permitted Activity under the NES-CS due to compliance with permitted activity soil removal volumes (i.e. 5 m³ / 500 m² site area) under the NES-CS.

A high-level remedial options assessment was conducted by FRL and other stakeholders involved in the project, and based on the proposed future use of the site for a mixture of residential purposes, remediation of the contaminated site soil/fill via excavation and removal to licensed landfill was determined to be the preferred approach.

2.2 Geotechnical Investigations

Lander Geotechnical Consultants Limited completed a geotechnical borehole investigation on 6 and 7 March 2021 (refer to Figure 1 for locations). Fill material was encountered in boreholes MH03 and MH05 to a maximum inferred depth of 8.5 m bgl and was typically described as a silty clay or clayey silt mixed with waste/refuse materials (described as wood, concrete, metal, brick, basaltic gravel, etc.). The natural underlying material was described as a silty clay, a silty sand, and vesicular basalt with various volcanic inclusions across the site present most commonly as layers of ash. Groundwater was reported between 2.8 m bgl and 6.19 m bgl. Initia Limited completed a geotechnical borehole investigation on 7 and 13 of October and 2 and 23 of November 2021 (refer to Figure 1 for locations). Fill material was encountered in boreholes BH02 and BH03 to a maximum inferred depth of 8 m bgl and was typically described as a clayey silt mixed with waste/refuse materials (described as pockets of bricks, concrete, and wood). The natural underlying material was described as a clayey silt and vesicular basalt with various volcanic inclusions across the site present most commonly as layers of ash. Groundwater was reported between 1.29 m bgl and 5.8 m bgl.

3.0 Remedial Goals and Objectives

3.1 Remediation Objective and Goals

The remediation objective that has been agreed by the project stakeholders is to remove any contaminated soils that are considered hazardous to human or environmental health so that site requires no legacy management or consents. Remaining site soil/fill is to comply with the lesser of AUP-OP PA criteria or NES-CS soil contaminant standards (SCS)/soil guideline values (SGV) and below BRANZ guidelines. It is noted that the Private Plan Change application proposes to allow a mixture of residential land uses, which could include residential properties with gardens, where vegetables may be grown for consumption, and high-density residential units with no or limited garden space and where home grown produce consumption does not occur. The most applicable guideline value will be applied to the remediated areas, depending on final development plans for the site and the type of dwellings to be constructed. Guideline values for the 'standard' residential scenario which allows for 10% produce consumption will be applied to areas where dwellings with gardens will be constructed; and guidelines

² The piece of land is that land on which a HAIL activity, has, is, or is more likely than not to have been, undertaken.

³ Refer to the PSI/DSI for further details on the assessment of consenting frameworks applicable for the site.

for a high-density residential scenario will be applied to areas where no produce production is possible and there is no or limited access to gardens.

3.2 Remediation Areas

The known and indicative areas required to be remediated to achieve the remediation goal are based on the result obtained during the DSI, and are shown in Figure 1. In summary these areas include:

- ∴ Lead impacted soils surrounding and underlying the Track Manager's House – with excavation of these soils to extend to the 'known' and 'inferred' extent, and to a depth of 0.3 m bgl and resultant material removed to a landfill licensed to receive material of this character. The known extent of soil requiring removal is anticipated to extent to 3 m on the north-eastern and north-western side of the house and to the property boundary on the south-eastern side of the house. The inferred extent of soil requiring removal from the southwestern side of the residence is anticipated to extent to 5 m. The areas will be marked out by a SQEP prior to removal of these soils. It is anticipated that a rough measure of this material requiring offsite disposal is 221 m³.
- ∴ Potential asbestos impacted fill material excavated within an inferred 10 m radius of TP7 and between a depth of 0.6 m – 2.9 m below ground level (or to confirmed 'natural ground'). This area will be marked out by a SQEP prior to removal of these soils. This indicative remediation area is estimated to comprise up to 181 m³ (to be confirmed onsite at the time of excavation and removal).

3.3 Remediation Programme

Based on the staged nature of the proposed works, it is anticipated that remediation of the known impacted soils will occur in the early stages of soil disturbance works in the associated areas onsite.

3.4 Remediation Methodology

The following section details proposed remediation methodology to address the risk posed by ground contaminants in excess of the site remediation goals.

General methodology is:

1. SQEP to attend site to delineate hotspots via mark-out the physical remediation areas using stakes, and fluorescent paint.
2. Contractor to excavate as per RAP and under SQEP supervision including any supporting requirements within the area containing asbestos material.
3. SQEP to attend site to confirm RAP specifications have been achieved and/or recommend further excavation.
4. SQEP to complete site observations of the completed excavation and obtain validation samples (if required) in order to confirm that lead/other soil impacts in the remaining soils comply with the site remediation criteria. Delineation samples would be represented by discrete samples surrounding the original sample above the relevant criteria, and are located at the same, and greater, depths than the original sample.
5. Laboratory analysis of the delineation samples.
6. SQEP to assess results and confirm successful remediation or if iterative removal required.
7. Soil disposal dockets have to be presented to PDP for incorporation in the Site Validation Report (SVR) at the completion of works stage.

4.0 Application of this Site Management Plan

4.1 General Application

This RAP/CSMP provides general controls to be applied to the site soil disturbance works re contaminants may be found above background quality (i.e. dust management, sediment and erosion controls, wheel washes, health and safety, etc – found within Section 5.0) and specific additional controls in areas of known and suspected contamination above the AUP-OP or NES-CS criteria (i.e. areas identified in Figure 1, and during any Unexpected Discoveries – refer Section 9.0)

This RAP/CSMP sets out the recommended processes to achieve safe and responsible management of impacted and contaminated soils during the project – the controls with the sections outlined below are to be applied site-wide, with any specific additional management requirements during remediation of key areas described in Sections 6.0 (lead), 7.0 (asbestos), and to be confirmed under Section 9.0.

If the controls outlined in this RAP/CSMP are implemented during the development works, it is considered that potential contamination effects on the environment and human health will be effectively mitigated.

4.2 Roles and Responsibilities

4.2.1 Distribution

A copy of this RAP/CSMP shall be kept by FRL (as the Person Conducting a Business or Undertaking (PCBU)) and provided to all Contractors working onsite as part of the remediation works. It is the responsibility of the lead Contractor to distribute the information contained within this RAP/CSMP to any Sub-Contractors and personnel at the site to ensure compliance with the RAP/CSMP.

The provisions of this RAP/CSMP are mandatory for all persons (employees, Contractors, and Sub-Contractors) who enter the site during the soil disturbance activities, until PDP and Auckland Council (AC) can confirm that they are satisfied that the remedial goals have been met.

4.2.2 Implementation

It is the responsibility of the lead Contractor and their Sub-Contractors (as applicable) to implement the processes within this RAP/CSMP (where applicable) and to ensure compliance with the RAP/CSMP.

The Contractor shall regularly liaise with PDP to ensure that work is being carried out in accordance with the RAP/CSMP, organise site inspections (if required) in accordance with the RAP/CSMP and discuss any contaminated land issues that may arise during soil disturbance activities.

A 'contamination briefing' will be given by a Suitably Qualified Environmental Practitioner (SQEP) with experience in contaminated land management and remediation to ensure that the Site Supervisor understands the RAP/CSMP and is made aware of how it should be appropriately implemented; and what protocols to follow should any unexpected contamination (refer Section 9.0) be identified.

- ∴ Specific details with respect to the handling of lead contaminated surface soils are provided in Section 6.0 below.
- ∴ A section outlining requirements under BRANZ guidelines, and the Health and Safety at Work (Asbestos) Regulations (HSWA (Asbestos)) was included, due to the identification of asbestos in the form of ACM in one of the test pits see Section 7.0 below.

4.2.3 Site Supervision

The proposed soil disturbance works at the site must be placed under the control of a single responsible person, i.e., a Site Supervisor, who shall ensure that the requirements within this RAP/CSMP, the BRANZ guidelines, the HSWA (Asbestos) and all consent conditions, are adhered to.

4.2.4 Contact Details

The following contact details are required to be filled out before the soil disturbance activities commence to ensure clear lines of communication are maintained.

Table 1: Document Control and Contact Details

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Document Title	Author	Date / Version No.
Remedial Action Plan and Contaminated Site Management Plan – Remuera Precinct, Ellerslie Racecourse, Auckland	PDP	September 2023 / Revision 3
Role	Name (organisation)	Contact Number
Client Representative (FRL)		
Client Representative (AC)		
Contractor Project Manager		
Site Manager/Supervisor		
Engineer to the Contract		
Contaminated Land Specialist/SQEP/Asbestos Assessor	Natalie Webster Pattle Delamore Partners Limited	021 385037
Geotechnical Engineer		

5.0 General Site Management Controls

5.1 Health and Safety Controls

It is noted that the soil testing results from the remainder of the site do not indicate any particular risk to the health and safety of site workers from chemical contaminant concentrations in the site soil/fill. However, the following controls and procedures shall be implemented on site by the Contractor and any Sub-contractors as part of a precautionary approach, to ensure that the health and safety of site workers is protected with respect to their contact with potential soil contamination.

This CSMP is not intended to relieve the Contractor and its Sub-contractors of their responsibility for the health and safety of their workers, contractors and the public, or their responsibility for protection of the environment. It is required that the Contractor and its Sub-contractors develop a site-specific health and safety plan to complement this CSMP and to address other health and safety requirements that may be applicable to their works. All site work is to be carried out by contractors acting under the HSWA 2015 regulations and guidelines. As a general principle, all measures shall be taken to prevent exposure of site workers to elevated levels of contaminants and other nearby workers by taking appropriate protective measures and by practicing good housekeeping.

All site workers are to be advised of the potential risks associated with soil/fill at the site and must be familiar with the content of this RAP/CSMP before the commencement of the soil disturbance; particularly with respect to the required PPE/RPE, personal hygiene procedures, and discovery of unexpected contamination protocols.

5.1.1 Personal Protective Equipment (PPE)

Protective and safety equipment must be made available to site workers during the soil/fill disturbance works on site. Site contractors are expected to wear 'standard' PPE for typical excavation/earthworks tasks (e.g., safety boots, overalls, hi-viz vests, hard hats, safety glasses etc). In addition, as a precautionary measure, workers who must directly handle soil/fill should wear nitrile gloves to prevent dermal contact with the soils.

Refer to Section 7.3 below for specific PPE/RPE considerations for soil disturbance in areas where asbestos/ACM has been identified.

5.1.2 Personal Hygiene

Site personnel will be made aware of the importance of personal hygiene. Direct skin contact with potentially impacted soil/fill and dust should be avoided as a precautionary measure but if contact does occur it shall be washed off as soon as possible. The following general measures will be implemented during the excavation works:

- ✧ Establish a designated eating area at the site. No eating/drinking/smoking is allowed outside of this area;
- ✧ Hands and other exposed parts of the body are to be washed prior to entering the designated eating area and on leaving the site. Water must be available on site for hand washing; and,
- ✧ Any protective gloves worn must be removed prior to eating, drinking, or smoking, and disposed of appropriately.

5.2 Erosion and Sediment Controls

There is the potential for contaminated sediment to be mobilised when entrained in stormwater during the soil/fill disturbance works. Therefore, prior to the commencement of any soil/fill disturbance activities at the site, appropriate erosion and sediment controls shall be constructed and confirmed to be operational. These controls shall be prepared in general accordance with Auckland Council Guidance Document 2016/005 (GD05) '*Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*' and the Ministry for the Environment publication '*Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions*'.

The controls shall be sufficient to avoid, remedy or mitigate the discharge of sediments (potentially contaminated or otherwise) across the site boundary or, in-line with best practises, these controls may include but not be limited to:

- ✧ Stabilised entranceway and vehicle wheel wash;
- ✧ Staging of earthworks;
- ✧ Catchpit protection;
- ✧ Silt fences; and,
- ✧ The use of mulch and geotextiles.

In addition to these controls, the following shall apply:

- ✧ As far as is practicable, all stormwater shall be contained within the work area boundaries (i.e. directed back into the work site), and allowed to soak back into the ground;
- ✧ Dust suppressive water applications at the site must be managed to ensure that sediment does not flow beyond the boundaries of the work area;

- ∴ Erosion and sediment controls shall be checked regularly to ensure that they are in good working condition. Control measures shall be upgraded/modified where necessary (along with the approval of the SQEP/PDP); and,
- ∴ Daily tidying-up of the work area shall be completed to minimise the potential for any leaching or erosion of excavated material by wind or water.

5.3 Dust Control

As a result of generally low concentrations of contaminants being present in surface and near-surface soils at the site, and in order to minimise dust as a general nuisance, all soil disturbance undertaken during the remediation works is to be carried out in such a way that the generation of dust is kept to the minimum practicable. As a prudent approach, and to avoid dust nuisance during the soil disturbance works, this will be achieved by:

- ∴ Advising all site workers of the need to minimise dust by the responsible operation of machinery;
- ∴ Maintaining a water supply onsite (e.g. hose and garden sprinkler, water truck, etc.) for the dampening down of soils on a regular basis, particularly during hot and dry, and windy periods;
- ∴ Avoid the spreading of soil beyond the defined site boundary via vehicle movements by the implementation of a wheel wash and daily tidying up; and,
- ∴ Suspending dust generating activities when dust control measures become ineffective due to increased wind speed.

The objective of these measures is to prevent visible dust emissions beyond the work area boundary. Dust control measures shall comply with the MfE, AC Technical Publication No. 152 (TP152; ARC, 2002) and the MfE publication '*Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions*' guidance documents.

Refer to Section 7.3 below for specific requirements for dust/asbestos fibre control during soil disturbance in areas where ACM has been identified.

5.4 Plant and Machinery

All plant and machinery working within the excavation areas onsite shall remain within these areas throughout the duration of the works. Any plant or machinery being removed offsite that has been in contact with potentially contaminated soil/fill (including truck wheels) shall be washed clean within the footprint of the remediation areas prior to removal.

The Contractor shall ensure that any wash-down water is diverted back into the excavation pits, to ensure that no potentially contaminated water or water containing contaminated sediment leaves the site.

For specific decontamination requirements for plant working within the lead impacted soil areas and areas where ACM has been identified refer to Section 7.3 below.

6.0 On-site Stormwater Retention Pond

No samples have been collected during the PSI/DSI investigation from the water or sediment present within the pond. This material will therefore need to be sampled and compared to applicable guidelines to determine appropriate disposal options of these.

7.0 Lead-Impacted-Soil Removal

Lead impacted soils were identified during the DSI surrounding the Track Manager's residence. The anticipated remedial area of lead contaminated soil comprises the 'known' and 'inferred' remediation areas shown on Figure 1, to be excavated to a depth of approximately 0.3 m bgl or natural ground (whichever is shallower). The known extent of soil requiring removal is anticipated to extent to 3 m on the north-eastern and north-western side of the house and to the property boundary on the south-eastern side of the house. The inferred extent of soil requiring removal from the southwestern side of the residence is anticipated to extent to 5 m. The areas will be marked out by a SQEP prior to removal of these soils. Resultant material removed from the site to a landfill licensed to receive material of this character (i.e. concentrations of lead in soil ranging from 268 – 647 mg/kg). It is anticipated that the indicative total volume of lead impacted material requiring offsite disposal is 221 m³ (rough measure).

The remedial process is expected to follow that indicated in Section 3.4.

The following site management procedures and controls relating to the lead-impacted-soils are to be followed and implemented during the remediation of this part of the site.

Note: The HSWA (Asbestos) requires an asbestos assessment comprising an asbestos management survey or pre-demolition survey to be conducted for all dwellings and associated structures (within the proposed rezoning area) that were constructed before January 1, 2000, to identify the location, area and class of any ACM associated with the building/s. The Track Manager's House falls within this timeframe, and if demolition of this building is required under the proposed development works, this pre-demolition survey for asbestos will be required. It is recommended that the survey and any required removals occurs prior to the excavation of the surrounding impacted soils can commence.

7.1 Personal Protective Equipment

The Contractor shall ensure that all personnel working with or encountering contaminated soil are wearing standard PPE as mentioned in Section 5.1.1 above.

The soil to be excavated and removed, depending on contaminant concentrations, may be hazardous to workers and/or other receptors in the site vicinity. The use of dust masks may be required in addition to the above-mentioned standard PPE if, in the opinion of the SQEP, there is potential for the dust generation and inhalation of contaminated dust during the remedial works.

7.2 Handling and Stockpiling of Soil

In known areas of contaminants special controls need to be applied to prevent cross contamination of contaminated and 'clean' areas. In general, and as far as practicable, contaminated soil shall be loaded directly into covered trucks for off-site disposal to an approved facility. Trucks and other contractor vehicles shall not drive across contaminated areas prior to, or during, the removal of the contaminated soil and should remain on stabilised areas where possible. Truck wheels shall be cleaned as necessary prior to egress from the site to prevent tracking of soil onto public roads.

In the event that the stockpiling of contaminated soil is required, stockpiles should remain within contamination areas, or on a geotextile (or similar) fabric barrier to demarcate between contaminated and 'clean'. If stockpiles are to be left in place for a prolonged period of time, where the ingress of stormwater and generation of dust is likely to occur, stockpiles should be covered with a pinned geotextile fabric or impervious material such as polythene.

7.3 Decontamination Procedures

All plant working within a contamination area shall remain within the area for the duration of the works. Any plant being removed off-site or out of contaminated areas (that has been in contact with the contaminated soils from the remedial excavation) shall be washed clean prior to moving to avoid cross-contamination. The Contractor shall ensure that any wash down water is diverted back into the excavation pits.

8.0 Asbestos-Impacted-Soil Removal and BRANZ Controls

Fragments of ACM were confirmed as present in test pit TP07 during the DSI. The soil was visually assessed to comply with BRANZ criteria of <0.01% w/w asbestos as ACM for a residential site; and, no asbestos (as ACM or as asbestos fines/fibrous asbestos (AF/FA)) was detected in the soil sample collected from the associated soils ('TP7_1.7'). As such this sample was also compliant with the relevant guideline in the BRANZ criteria of <0.001% w/w asbestos as AF/FA.

The remedial process is expected to follow that indicated in Section 3.4. PDP recommends they are present in an observatory role during the excavation of fill material from this area to screen and assess the amount of asbestos/ACM present in this area. The indicative possible extent of this material is within a 10 m radius of TP7 and between an approximate depth of 0.6 m – 2.9 m bgl (based on field observations during the DSI). It is anticipated that the indicative volume of fill material containing ACM could be up to 181 m³ (rough measure) in this area.

The following sub-sections detail the specific site controls relating to ACM and asbestos-impacted-soils that are required to be undertaken during the remedial works at the site. In the case, that ACM is encountered in greater quantities than observed during the previous investigations, provisions of the Unexpected Discovery section (Section 9.0) will be triggered in line with BRANZ guidelines.

8.1 Asbestos-Impacted-Soil Management Using BRANZ Guidelines

The BRANZ Guidelines are applicable for the management of sites with asbestos-in-soil impacts. Although the identification of ACM and subsequent asbestos-in-soil sample results comply with the BRANZ criteria for a residential site, additional controls are required during the active disturbance of these soils. The controls required would currently be linked to those of 'Unlicensed Asbestos Works' under BRANZ Guidelines Figure 1 – Decision Flowchart for work involving asbestos in soil.

This level of asbestos-in-soils does not require Worksafe notification (discussed further below) or licensed contractors but does require the lead Contractor to act as a Competent Person with respect to asbestos management – having the skills and experience required to identify and safely manage ACM and/or asbestos in soils. Disturbance of these soils will also require several additional conditions to be met during the site works including:

- ∴ PPE and RPE requirements (refer Section 7.3), dust suppression, and decontamination facilities (refer to BRANZ Guidelines Table 6 – Primary mitigation control requirements for work involving asbestos); and,
- ∴ Visual vehicle assessment for demobilisation from the site completed by a SQEP/Competent Person, truck lining/wrapping depending on receiving landfill requirements, closed cabs in excavator/truck and standard air conditioning (refer BRANZ Guidelines Table 7 – Vehicle decontamination requirements).

8.2 WorkSafe Notification

A WorkSafe NZ notification for the removal of the identified level of asbestos in soils is not required. However, it is possible that further asbestos will be identified during excavation of soil/fill within this area, or other areas, of the site. Discovery of greater quantities (i.e. >10 m² of total asbestos across the site) of ACM will require the excavation works to be halted until WorkSafe is notified, and a Licensed Asbestos Removalist is engaged.

It is therefore recommended, that the project team consider appointing a Licensed Asbestos Removalist to support the project and provide advance notification to WorkSafe before the commencement of excavations to prevent delay to programme in the event of additional asbestos/ACM discovery.

8.3 PPE, RPE and Asbestos Fibre Controls

Asbestos specific PPE required by the site workers involved with the excavation of these soils; however, it is identified within the BRANZ Guidelines (Table 6) that this requirement can be removed if asbestos air monitoring (in line with the methods in the *Approved Code of Practise for the Management and Removal of Asbestos* (ACOP; Worksafe, 2016)) can demonstrate asbestos below 'trace level' (<0.01 fibres/mL). PDP will advise around this requirement during the site works.

Precautionary PPE/RPE recommended to be kept on site should include (but not be limited to):

- ∴ Disposable coveralls rated type 5, category 3, nitrile gloves, steel toe capped gumboots or safety footwear with disposable overshoes.
- ∴ Disposable P2 dust mask.

Additionally, the following should be adhered to for the excavation of asbestos-impacted soils:

- ∴ Demarcation in this case should include a physical barrier to prevent non-essential workers from entering or walking through the area;
- ∴ Signage notifying workers of the asbestos hazard should be attached to the physical barrier;
- ∴ Appropriate decontamination area should be setup at the one entry/exit point for the works, and all workers should use this as the only entry/exit point for the works area;
- ∴ Only essential workers, wearing the appropriate PPE/RPE should enter the work area;
- ∴ Soils within the demarcated area should be dampened down with a variable rate spray nozzle (or similar approved alternative). Consideration of water flow rates should be given to provide enough water to prevent dust (which could potentially contain asbestos fibres) from escaping from the demarcated area, but not so much as to generate active run-off from the works area. This process should be ongoing throughout the excavation and removal of the asbestos impacted fill.
- ∴ Above controls would also further apply to any areas of temporarily stockpiled soils. Particular attention should be given to the location (if required) to avoid cross contamination of 'clean' areas of the site.
- ∴ Appropriate vehicular access (i.e., for cartage trucks, etc) should be planned by the Site Supervisor to best allow the wrapping and loading of trucks without them moving across asbestos-impacted soils and potentially cross-contaminating 'clean' areas of the site (washing of truck wheels and visual inspection should be undertaken by the Site Supervisor).

9.0 Soil Management Processes

The following should be considered prior to disposal:

- ∴ Prior approval from the intended fill disposal facilities will be required before mobilisation to site – this will include whether cartage trucks need to be wrapped and/or covered; and,
- ∴ All off-site soil disposal movements shall be tracked by the Site Supervisor using landfill weighbridge receipts and disposal truck registration plates. These receipts shall be retained as proof of appropriate disposal, to be provided to the PDP.

9.1 Disposal of Site Soils

9.1.1 Lead Impacted Soils

Lead-impacted-soil (refer Figure 1 for extent) will require disposal to a landfill licensed to accept soil/fill with the concentrations of lead as identified in the previous soil sample results (ranging from 268 – 647 mg/kg). These materials are likely suitable for disposal at a contaminated fill landfill.

9.1.2 Asbestos Impacted Soils

Where asbestos impacted soil/fill may require disposal; it is anticipated that this soil/fill will require disposal to a landfill licensed to accept soil/fill containing ACM. This should be confirmed with the intended receiving fill facility prior to disposal and may require additional characterisation via analytical sampling.

9.1.3 Stormwater Retention Pond Surface Water and Sediments

No samples were collected from the existing stormwater retention pond during the PSI/DSI investigation. Sampling of the sediment and surface water is recommended to inform suitable disposal facilities if required.

9.1.4 Other Site Soils

Where other site soil/fill may require disposal and based on various low-level detections of PAHs, and concentrations of heavy metals that exceed natural background levels, it is anticipated that this soil/fill will be suitable for disposal at a Managed Fill facility licensed to accept the identified concentrations of contaminants. This should be confirmed with the intended receiving fill facility prior to disposal and may require additional characterisation via analytical sampling.

9.2 Re-Use of Site Soils

The remainder of site soil/fill material (outside of the lead remediation area) report results which comply with guidelines protective of human and environmental health, and in the context of future residential site use, may be re-used onsite where required (subject to meeting other geotechnical, earth-working, and resource consent requirements).

9.3 Imported Fill Materials

Any imported fill materials are required to be sourced from sites which have not had/do not have HAIL activities undertaken on them and/or where material can be demonstrated to meet the definition of 'cleanfill' in the AUP-OP. Any material not sourced from non-certified cleanfill site may require additional testing or certification to confirm the material meets the 'cleanfill' definition prior to being accepted and used on site.

The Contractor shall be responsible for communicating their intention to import material to the site to PDP, who can advise on whether additional testing of this material is required. A record should be kept (e.g. truck docket) of all imported fill material used on site.

10.0 Discovery of Unexpected Contamination

Due to the DSI sample locations being undertaken at selected locations on the site, it is possible that there could be areas of contamination at the site that have not been identified during the DSI. All site workers shall be informed regarding the procedures to be followed if unexpected contamination is discovered during site works.

Typical indicators of soil/fill contamination may include but not be limited to:

- ∴ Stained or discoloured soils (possibly black, blue, grey or green staining);
- ∴ The presence of refuse, including putrescible waste and household rubbish;
- ∴ Petroleum hydrocarbon or solvent odours/vapours; and,
- ∴ Chemical containers/drums.

If visual or olfactory indicators of contamination are encountered, then the following actions must be taken:

1. Excavation works in that area shall cease immediately and the site supervisor must be contacted;
2. Note: In the event of an uncontrolled discharge of contaminants all practicable steps to contain the discharge and prevent further discharge while not compromising the health of site workers shall be taken;
3. The area of concern must be fenced/barricaded/isolated/covered to prevent other site workers from entering the area until an assessment of the potential contamination can be undertaken by PDP;
4. PDP shall be contacted immediately to determine the appropriate course of action; and,
5. Advice on the required sampling and / or remedial actions for the potential contamination will be provided by PDP.

In the event that the scale or nature of an Unexpected Contamination issue encountered onsite differs significantly from the existing site information, AC will be informed and the suitability of the controls and procedures in this RAP/CSMP will be assessed by PDP. Further controls may be necessary to ensure that health, safety, and environmental issues are managed appropriately. Any consent conditions relating specifically to Unexpected Contamination discovery must be complied with.

11.0 Site Validation

11.1 Validation Sampling

Soil sample results from the DSI sampling have largely confirmed the extent of the required remedial excavations and are expected to be able to be used as future 'pre-validation samples'.

Where the remedial extent is currently 'indicative' (shown on Figure 1 by dashed lines), it is proposed that visual inspection and validation sampling (if required) will be carried out in accordance with the MFE *Contaminated Land Management Guidelines No.5 – Site Investigation and Analysis of Soils* (MfE, 2021b), and BRANZ guidelines to confirm that the sites remedial goals have been met (refer to Section 3.0). Consideration will be given to sampling the base and walls of the remedial excavation footprint.

11.2 Reporting

As part of the anticipated resource consent conditions requiring a Site Validation Reporting (SVR) for these works (as recommended in the PSI/DSI), the following information will be collected and provided to PDP for each 'stage' or 'season' of the earthworks:

1. Remedial area extent, and the total volume of soil/fill removed from site;
2. Results and further information for any Unexpected Contamination investigations and sampling undertaken;
3. Details of the results of validation sampling or visual validation inspection completed at the site;
4. Details of the contaminant concentrations and location of any contaminated soil/fill remaining at the site (if any);
5. Records of soil/fill disposal, including copies of all disposal manifest forms, weighbridge dockets; and,
6. Records of any imported fill material.

12.0 References

- Auckland Council, 2016. Auckland Unitary Plan (AUP) – Operative in Part.
- Auckland Council, 2016. Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region (GD05).
- Auckland Regional Council, 2002. Technical Publication 152 – Assessing Discharges of Contaminants Into Air.
- ACOP, 2016. WorkSafe New Zealand, Code of Practice for the Management and Removal of Asbestos.
- BRANZ, 2017. BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.
- HSWA, 2015. Health and Safety at Work Act.
- HSWA (Asbestos), 2016. Health and Safety at Work (Asbestos) Regulations.
- MfE, 2001. Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions. Ministry for the Environment.
- MfE, 2011. Hazardous Activities and Industries List (HAIL) October 2011. Ministry for the Environment.
- MfE, 2021a. Contaminated Land Management Guidelines No. 1. Reporting on Contaminated Sites in New Zealand. Ministry for the Environment.
- MfE, 2021b. Contaminated Land Management Guidelines No. 5. Site Investigation and Analysis of Soils. Ministry for the Environment.
- NES-CS, 2011. Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.
- PDP, 2023. *Preliminary and Detailed Site Investigation – Remuera Precinct – 79 Ladies Mile, Remuera, Auckland*. Pattle Delamore Partners Limited.

13.0 Limitations

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Fletcher Residential Limited and others not directly contracted by PDP for the work including Auckland Racing Club, Lander Geotechnical Consultants Limited and Initia Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of Fletcher Residential Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

This document has been prepared based on the sampling investigations completed by PDP on 29 March and 6 to 7 May 2021 and the results from laboratory analyses or field data gathered by PDP. The site conditions as described in this document have been interpreted from, and are subject to, this information and its limitations and accordingly PDP does not represent that its interpretation accurately represents the full site conditions.

The laboratory test results provide an approximation of the concentration of the tested analytes and are subject to the inherent limitations of the laboratory techniques used for the tests.

This assessment is limited to collection and analysis of soil samples from discrete sampling locations. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distance away from the specific points of sampling.

Soil volumes are indicative only and the actual volume of impacted materials may be more or less than indicated.

The information contained within this document applies to sampling undertaken on the dates stated in this document, or if none is stated, the date of this document. With time, the site conditions and environmental standards may change. Accordingly, the reported assessment and conclusions are not guaranteed to apply at a later date.

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Yours faithfully

PATTLE DELAMORE PARTNERS LIMITED

Prepared by



Myra Belkot

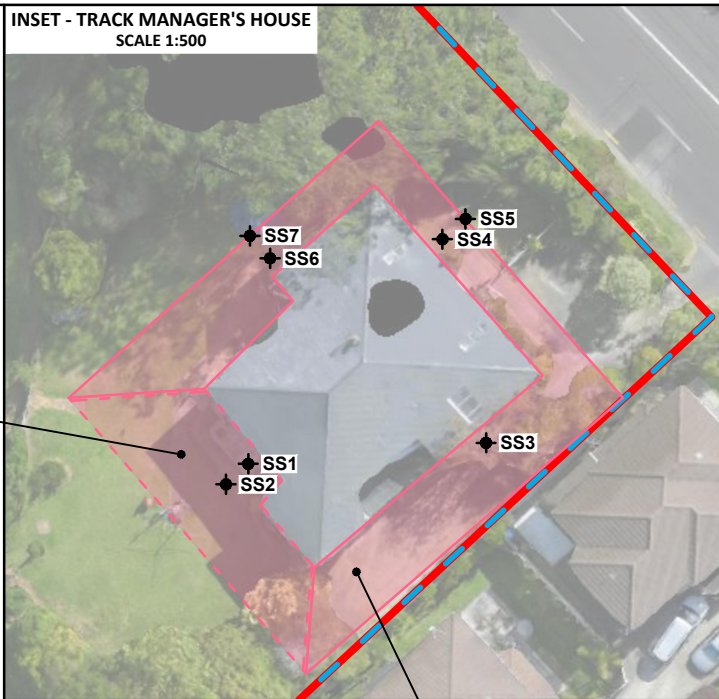
Environmental Scientist

Reviewed and approved by



Natalie Webster

Technical Director – Contaminated Land



GENERAL NOTE:
DUE TO THE RESOLUTION OF SAMPLES COLLECTED DURING THE DSI PHASE OF THE WORKS, IT IS POSSIBLE THAT THERE COULD BE AREAS OF CONTAMINATION AT THE SITE THAT HAVE NOT BEEN IDENTIFIED DURING THE DSI. THESE WILL BE COVERED WITH AN 'UNEXPECTED DISCOVERY' PROTOCOL WITHIN THE SITE MANAGEMENT PLAN/REMEDIAL ACTION PLAN DOCUMENT.

INFERRED REMEDIATION AREA:
ASBESTOS - TBC
> 10m RADIUS FROM TEST PIT TO BE INSPECTED DURING REMOVAL
INFERRED DEPTH 0.6m - 2.9m

EXISTING POND:
NO SAMPLES WERE TAKEN DURING THE PSI/DSI INVESTIGATION

KNOWN REMEDIATION AREA:
INFERRED DEPTH 0.3m

KEY:

	TEST PIT LOCATION (EXCAVATED PDP, MAY 2021)
	SOIL SAMPLE LOCATION AND DEPTH (m)
	SURFACE SAMPLE LOCATION (SAMPLED PDP, MAY 2021)
	MACHINE BOREHOLE WITH SOAKAGE TEST LOCATION (DRILLED INITIA, OCT 21)
	HAND AUGER BOREHOLE LOCATION (DRILLED LANDER, MAR 2021)
	MACHINE BOREHOLE LOCATION (DRILLED LANDER, APR 2021)
	HAND AUGER BOREHOLE LOCATION (DRILLED LANDER, MAR 2021, SAMPLED PDP, MAR 2021)
	MACHINE BOREHOLE LOCATION (DRILLED LANDER, APR 2021, SAMPLED PDP, APR 2021)
	SITE INVESTIGATION AREA
	PROPERTY BOUNDARY ¹

SOURCE:
1. TOPOGRAPHICAL SURVEY INFORMATION (WIG.dwg) AND DRONE IMAGE SUPPLIED BY HG, RECEIVED 23/03/2021.
2. LANDER HAND AUGER AND MACHINE BOREHOLE LOCATIONS DERIVED FROM J01706_210409_SIPan.pdf, SUPPLIED BY LANDER GEOTECHNICAL.
3. INITIA MACHINE BOREHOLE LOCATIONS DERIVED FROM 1218-001-001 REV D.pdf, SUPPLIED BY INITIA GEOTECHNICAL SPECIALISTS.



0 10 20 30 40 50m
SCALE 1:1,250 (A3)

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NO. REVISION		DATE

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FIGURE
FIGURE 1: REMEDIAL AREAS AND SAMPLING LOCATION PLAN
PROJECT
REMEDIAL ACTION PLAN AND CONTAMINATED SITE MANAGEMENT PLAN - REMUERA PRECINCT, ELLERSLIE RACECOURSE, AUCKLAND