

Appendix J – Land Contamination Report prepared by 4Sight Consultants



LAND. PEOPLE. WATER.

Preliminary Site Investigation (PSI) & Detailed Site Investigation (DSI) Report

SH24 Matamata Industrial Plan Change and
Future Subdivision

For Veros Ltd

November 2021

REPORT INFORMATION AND QUALITY CONTROL

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EXECUTIVE SUMMARY

4Sight Consulting Ltd (4Sight) has been engaged by Veros Ltd ('the Client') to undertake a Combined Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) at 194 SH24, Matamata (herein referred to as 'the Property'). This investigation has focused on the area of the Property proposed for industrial plan change and future subdivision ('the Site').

The objectives of the Combined PSI & DSI are to determine whether an activity or industry listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) is being, has been, or is likely to have been conducted at the Site, to determine concentrations of contaminants in soil through targeted sampling, and to assess potential implications for the proposed future industrial subdivision under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE, 2011), and the Waikato Regional Plan (WRP).

This Combined PSI & DSI included reviewing the Site's history, soil sampling, and field observations. The key findings are:

- Prior to the early 1940's the Site was in pasture and used for pastoral production, after which the Site was used for equine purposes from circa 1950's to circa 2013 followed by crop production (asparagus and oats) until present;
- Several small farm sheds were present across the Site from the early 1940's, while a dwelling was present in the northeast of the Site prior to the early 1940's and removed prior to the early 2000's. A second dwelling was constructed in the north of the Site at a time prior to the mid 1960's, and still remains present onsite at the time of this investigation;
- A farm building and adjoining animal pen was present in the west of the Site from prior to the early 1940's with various expansions until removal circa 1990. An area of intensive animal grazing was identified in the southeast from prior to the early 1940's to the mid 1960's;
- Two surface depressions were identified near the western boundary of the Property and one in the centre of the Site from 1943 to prior to the mid 1960's. A fourth depression was identified near the centre of the Site from circa early 1980's to circa 1990. None of these were visible during the Site walkover;
- Soil disturbance / earthworks were identified to have occurred in the southeast of the Property from circa 1990;
- At the time of the Site walkover, a large pile of treated fence posts and timber was identified in the southeast of the Property, and a large stockpile of sand and smaller stockpiles of fill material sourced from roadworks on SH24 were also identified in this area;
- A change in development plans following the Site investigation has led to some features investigated being outside of the Site boundary (two former depressions, stockpiles of material and large pile of treated fence posts);
- Soil sampling involved the collection of 42 soil samples from 18 targeted locations at depths between 0.0-1.0 meters (m) below ground level (bgl) and two bulk samples of fibre cement sheeting were collected from where potential asbestos containing material (PACM) was identified around the halo of the vat room and shed. The results identified:
 - The concentrations of heavy metals detected in all samples analysed were below the NESCS Soil Contaminant Standards (SCS) for the commercial / industrial outdoor worker (unpaved) land use scenario, and below the adopted National Environmental Protection Measure (NEPM) criteria for nickel and zinc;
 - Heavy metal concentrations exceeded typical background concentrations in several samples, while arsenic exceeded Waikato Regional Council (WRC) Cleanfill Criteria beneath a large pile of treated fence posts and timber, and within the former intensive animal grazing area;
 - A range of polycyclic aromatic hydrocarbon (PAH) compounds were detected in the composite sample SH24-03 taken from fill material (sourced from beneath SH24), with total PAH at 0.5 mg/kg;
 - 4,4'-DDE and 4,4'-DDT were detected in samples SH24-06 and SH24-07 at the location of the former intensive animal grazing. Total DDT isomer concentrations at these locations were 0.1 mg/kg and 0.19 mg/kg respectively, below the WRC Cleanfill criteria (0.7 mg/kg);

- Fibre cement sheet sample Bulk-02 was confirmed to contain chrysotile (white asbestos), collected from the ground at the northern side of the vat room; and
- No asbestos was detected in any of the soil samples submitted for analysis.
- Using a multiple lines of evidence approach it is considered unlikely that HAIL activity A8 'Livestock dip or spray race operations' at the location of the area of intensive animal grazing applies to the area on the following basis:
 - No structures have been identified within historic aerials that indicate a dipping or spray race operation;
 - No structures were identified during sampling activities which extended up to 0.5 m bgl within the area of concern. Additionally, tilling has routinely been conducted across the Site which has mixed topsoil to a depth of 0.5 m bgl. As the whole of this area has historically been tilled this indicates that the potential for buried structures associated with dip activities to be highly unlikely; and
 - The concentrations of OCP's identified only slightly exceeded laboratory detection limits and were well below WRC regional background levels.
- Soil sampling confirmed that ACM associated with the farm buildings is considered highly unlikely to have impacted soils in the vicinity of the vat room;
- Although soil samples were not collected or analysed from the four former depressions at the Site and Property, soils at the locations of each of the depressions were visually investigated with no fill material or indicators of contamination identified at any of these locations; and
- Based on the above set of criteria, and that all soil sampling analytical results were below the adopted human health criteria, it is considered highly unlikely that HAIL activity I has occurred at the Site ('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'). This is on the basis that hazardous substances need to be present in sufficient quantity to present a risk to human health or the environment, and there was no evidence of this.

Based on the findings of this Combined PSI & DSI, the following recommendations are made:

- This Combined PSI & DSI has confirmed that soils across the Site are suitable for the proposed industrial land use and future subdivision and are considered highly unlikely to present a risk to human health or the environment;
- The NESCS does not apply to the Site as it does not meet the definition of subclause 5(7), specifically there is no evidence of HAIL activities at the Site;
- Minor ACM fragments on surface soils at the northern side of the vat room should be removed by a licenced asbestos removalist or competent person. Prior to the demolition of the vat room and other farm buildings an asbestos demolition survey should be undertaken to identify all potential ACM present within the buildings;
- No contamination has been identified as part of this investigation that presents a risk to the environment or human health requiring remediation, therefore it is considered that the contaminated land rules within Section 5.3 of the WRP do not apply to the Site.

1 INTRODUCTION

4Sight Consulting Ltd (4Sight) has been engaged by Veros Ltd ('the Client') to undertake a Combined Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) at 194 SH24, Matamata (herein referred to as 'the Property'). This investigation has focused on the area of the Property proposed for industrial plan change and future subdivision ('the Site').

The objective of the Combined PSI & DSI is to determine whether an activity or industry listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) is being, has been, or is likely to have been conducted at the Site, to determine concentrations of contaminants in soil through targeted sampling, and to assess potential implications for the proposed future industrial subdivision under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE, 2011), and the Waikato Regional Plan (WRP).

Consideration of the NESCS is required for the activities of subdivision, change of land use and soil disturbance on pieces of land that have been subject to any activities or industries listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL).

Land covered in the NESCS is defined in regulation 5(7) as:

A piece of land that is described by one of the following:

- a) An activity or industry described in the HAIL is being undertaken on it;*
- b) An activity or industry described in the HAIL has been undertaken on it;*
- c) It is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.*

This Combined PSI & DSI report has been prepared in general accordance with Ministry for Environment (MfE) Contaminated Land Management Guidelines No.1 Reporting on Contaminated Sites in New Zealand (Revised 2021) (CLMG No. 1).

1.1 Scope of Works

The scope of this Combined PSI & DSI has included the following:

- A review of selected publicly available information for the Site, including council files and historical aerial photographs, and an owner interview to determine whether or not any activities or industries on the HAIL are, have been, or might have been undertaken on the Site;
- Site inspection to visually assess the presence of any activities or industries listed on the HAIL or evidence of potential contamination;
- Targeted collection of 42 soil samples from 18 locations across the Site;
- Analysis of selected soil samples for contaminants of potential concern (CoPC) and associated with the historic use of the Site; and
- An overall assessment of the applicability of the NESCS and WRP.

2 SITE DETAILS

The Site is located in Matamata and details of the Site are provided in Table 1. The location of the Site is shown in Figure 1.

Table 1. Address and Site Information

| Site Address | Legal Description | Area (ha) |
|--------------------|----------------------------|-----------|
| 194 SH24, Matamata | Lot 200 DP 548170 (937553) | 41 |

2.1 Land Use – Current and Proposed

The Matamata-Piako District Council (MPDC) District Plan illustrates that the Site is currently zoned as Rural. The Site is currently utilised for crop production, and a gully forms the south-eastern section of the Site. It is understood that a industrial plan change and subsequent subdivision is proposed for 41 hectares of land at the Site, which will include a swale around the boundary and through the western section of the Site, but excludes a stormwater pond in the southeast. The plans prepared to support the plan change are presented as Appendix A.

Surrounding land uses are generally pastoral farmland, with the Matamata Refuse Transfer Station east of the Site and commercial / industrial facilities northwest of the Site on land zoned industrial.

2.2 Environmental Features

2.2.1 Geology

The Institute of Geological and Nuclear Sciences (GNS) 1:250,000 online geological map shows the regional geology consists of Late Pleistocene river deposits containing cross-bedded pumice sand, silt and gravel with interbedded peat.

The very eastern section of the Site in the gully consists of Holocene river deposits described as alluvial gravel, sand, silt, mud and clay with local peat; includes modern river beds.

The S-map online soils database indicates that soils across the Site are generally Otorohanga *f*, a typical orthic allophanic soil type. Soil texture is identified to be loamy, deep, moderately well drained, high available water and high phosphate retention.

2.2.2 Topography

Topography data accessed through the Waikato Regional Council (WRC) Contours map identifies the Site as generally flat and approximately 60 m above sea level (asl). The topography falls away in the southwest of the Site into the gully to approximately 43 m asl.

2.2.3 Hydrology

The closest surface water body is the Mangawhero Stream located southeast of the Property, approximately 70 m southeast of the Site.

2.2.4 Hydrogeology

A search of the WRC groundwater map identified four groundwater bores on the Site, as presented in Table 2. Six other groundwater bores are present within 500 m of the Site, ranging from 9.10 to 20.0 m depth.

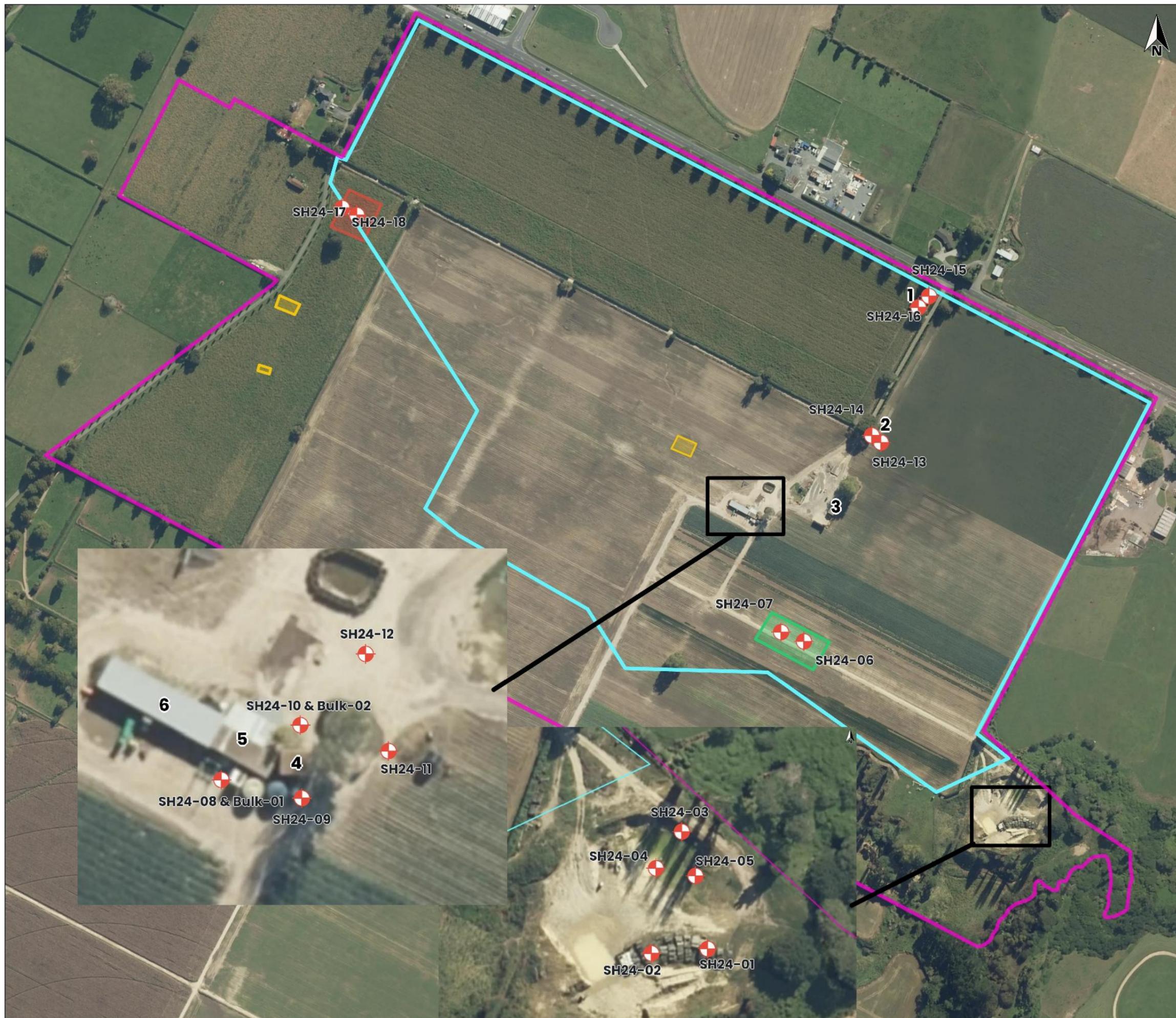
Table 2. Nearby Groundwater Bores and Water Take Consents

| Bore No. | Consent Ref. | Address | Distance & Direction from Site | Bore Details |
|----------|--------------|-----------------|--------------------------------|---|
| 64_939 | - | 0 TAURANGA ROAD | Onsite (north) | Depth: 6.0 m Screen depth: 3.3 m Diameter: 100 mm |

| | | | | |
|---------|---|-----------------|--------------------|---|
| 64_36 | - | 0 TAURANGA ROAD | Onsite (northeast) | Depth: 15.50 m Screen depth: - Diameter: 100 |
| 72_6680 | - | 0 TAURANGA ROAD | Onsite (west) | Depth: 73.50 m Screen depth: 65.50 m Diameter: 300 mm |
| 72_8022 | - | 0 TAURANGA ROAD | Onsite (southwest) | Depth: 24.00 m Screen depth: 18.00 m Diameter: 50 mm |

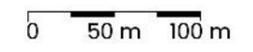
Additionally, a Geotechnical Investigation Report (GIR) was undertaken by CMW Geosciences Ltd in August 2021 (CMW Geosciences Ltd, 2021). Section 5.4 of the report identifies shallow perched groundwater 2.7 to 4.8 m below ground level (m bgl), below which groundwater lies between approximately 12.2 to 14.9 m bgl.

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Legend

- 1. Dwelling
- 2. Stock Loading Yards
- 3. Implement Shed
- 4. Vat Room
- 5. Shed
- 6. Four Bay Lean To
- 📍 Approximate Soil Sampling Locations
- 🟪 Property Boundary
- 🟩 Site Boundary
- 🟡 Former Depression
- 🟢 Former Intensive Grazing
- 🏠 Former Farm Building and Adjoining Animal Pen Area



LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by **Datanest.earth**

| | | |
|---|---------------|--------------------------|
| Title: Site and Soil Sampling Locations | | |
| Client: Veros Ltd | | |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | Figure No: 1 Size: A3 |
| Date: 18-10-2021 | Checked: AG | |
| Proj No: 9062 | Scale: 1:5169 | Version: Final |

3 SITE HISTORY

To understand the history of the Site and particularly the nature and location of any potentially contaminating activities, a review of selected publicly available information for the Site was undertaken. This included searches of:

- MPDC Property File;
- WRC Landuse Information Register (LUIR);
- Selected historical aerial photographs available through Google® Earth™ and Retrolens;
- Hazardous Substances and Incidents report provided by the Environmental Protection Agency (EPA); and
- An onsite walkover and interview with the current Site manager.

3.1 Council Records

3.1.1 Property File Review

The Property File was request and received from MPDC on 1 September 2021. The Property File identified a number a resource and building consents associated with the Property and Site, and are summarised as follows:

- Resource Consent (RC) 101.2016.11205.9 & 10 and 06.2016.11205.1 (dated 18/01/2021): To subdivide the Site and Property from a larger land holding;
- Building Consent (BC) 2010.719 (dated 07/09/2010): To construct a 4 Bay Lean To (centre of the Site);
- Building Permit (BP) I3536 (dated 10/04/1978): To erect a vat room (centre of the Site). Building plans identified slats to be constructed of wood or asbestos; and
- BP G77201 (dated 07/10/1975): To construct a carport (location unknown).

3.1.2 WRC LUIR Request

A search of the LUIR, maintained by WRC, was requested and results were provided on 31 August 2021 and can be found in Appendix B. The LUIR provides a detailed register of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. The response indicated that the Site is associated with a wider HAIL area and appears on the LUIR with a classification of ‘Unverified HAIL – no sampling’ due to current land use for HAIL activity ‘A10. Persistent pesticide bulk storage or use’ associated with Kaimai Fresh Limited.

3.1.3 Hazardous Substances and Incidents Report

The Environmental Protection Agency (EPA) maintained a list of reported hazardous substance incidents over the period July 2006 – December 2011. A review of the EPA register over this period, accessed August 2021, identified no incidents at the Site or within a 200 m radius of the Site.

3.2 Aerial Photographs

Historical aerial photographs were reviewed and sourced from Retrolens and Google® Earth™. These are described in Table 3 and can be found in Appendix C.

Table 3. Aerial Photography Summary

| Year | Reference | Observations |
|------|------------------------------|--|
| 1943 | Retrolens (black & white) | Site: The Site is generally in pasture. A dwelling is present in the northeast of the Site, with two farm sheds in the centre and small farm structures / sheds are present in the east, south, centre and west of the Site. A small farm building and adjoining animal pen is present in the west (half of which extends |

| | | |
|------|------------------------------|---|
| | | <p>onto the Site) and an area of intensive animal grazing is present in the southeast.</p> <p>Property: The south-eastern section of the Property forms a gully and two depressions are present in the west.</p> <p>Offsite: Site surroundings are pastoral, with a gully forming the eastern Site boundary.</p> |
| 1966 | Retrolens (black & white) | <p>Site: A dwelling has been developed in the north of the Site, and a shed in the east. An access track has been developed in the eastern section of the Site leading to the two farm sheds in the centre. Farm structures / sheds identified across the Site are no longer visible. The intensive grazing in the southeast has reverted back to pasture. Trees have been planted at selected locations across the Site.</p> <p>Property: Both depressions in the west are no longer visible.</p> <p>Offsite: Rural residential dwellings have been developed north of the Site, and some earthworks have occurred east of the Site. Industrial development to the northwest.</p> |
| 1974 | Retrolens (black & white) | <p>Site: The farm building and adjoining animal pen area in the west has increased in size and appears more intensive.</p> <p>Property: Same as above for Site.</p> <p>Offsite: Part of the gully to the east of the Site has been filled. Further industrial development to the northwest.</p> |
| 1981 | Retrolens (black & white) | <p>Site: A depression is present in the centre of the Site.</p> <p>Property: No significant change.</p> <p>Offsite: Further earthworks east of the Site have been undertaken.</p> |
| 1990 | Retrolens (black & white) | <p>Site: The depression in the centre is no longer visible. The farm building and adjoining animal pen area in the west has been removed, and one of the farm sheds in the centre has been removed.</p> <p>Property: Earthworks have encroached in the very east of the Property.</p> <p>Offsite: Further earthworks east of the Site have been undertaken.</p> |
| 2003 | Google Earth (colour) | <p>Site: The dwelling in the northeast has been removed.</p> <p>Property: No significant change.</p> <p>Offsite: No significant change.</p> |
| 2013 | Google Earth (colour) | <p>Site: Cropping has occurred in the very west of the Site. The majority of the trees have been removed from the Site (illustrated by circular patches of soil disturbance and soil disturbance associated with vehicle movements), and appear to have been burnt in piles within the centre and in the northeast of the Site. The farm shed in the centre of the Site has been replaced.</p> <p>Property: Cropping has occurred in the very west of the Property. Soil disturbance is occurring in the southeast of the Property.</p> <p>Offsite: No significant change.</p> |

| | | |
|------|------------------|---|
| 2016 | LINZ (colour) | <p>Site: The entire Site has been subject to cropping activities (three different cropping areas identified).</p> <p>Property: Cropping activities are occurring on the Property.</p> <p>Offsite: Site surroundings have been subject to cropping.</p> |
| 2021 | LINZ (colour) | <p>Site: No significant change.</p> <p>Property: No significant change.</p> <p>Offsite: No significant change.</p> |

3.3 Site Walkover

An initial Site visit was undertaken by 4Sight staff on 1 September 2021. Photos of the Site visit are presented in Appendix D and the Site location and features are presented in Figure 1. The following observations were made during the Site walkover and inspection:

- The Site is currently in use for asparagus an oat production, with majority (90%) of the Site being tilled soil associated with these activities;
- A dwelling was present in the north of the Site (feature 1), adjacent the road front. The dwelling was constructed of wooden boards with a corrugated iron roof. Potential asbestos containing material (PACM) was identified on the dwelling as soffits, identified to be in good condition. Some minor damage to exterior paint was also identified on the dwelling;
- The centre of the Site contained some wooden stock loading yards (feature 2), with a concrete slab base and an external wooden step parallel to the run;
- North of the wooden stock loading yards was a pile of tree branches;
- An implement shed (feature 3) was present south of the wooden stock loading yards, constructed of corrugated iron. This contained miscellaneous materials associated with the Site use (i.e. wooden bins and bags of phosphorus fertiliser stacked on wooden pallets). Several wood bins were stacked on the western side of the shed, with an intermediate bulk container (IBC) containing phosphoric acid;
- A small concrete water trough was present west of the implement shed, with burnt rubbish contained within;
- A vat room (feature 4) was identified west of the implement shed. The exterior displayed toxic and flammable warning signs, and contained a range of fungicides (difenoconazole containing) on a concrete floor in good condition. Empty fungicide bottles were stored directly outside the vat room;
- Fibre cement sheeting (PACM) was identified on the exterior of the vat room, with broken fragments on the ground across a small area (~2 m²) on the northern side;
- A shed (feature 5) was present directly west of the vat room, containing several small (500ml-5L) bottles of motor oil, on a concrete floor in good condition, while a portable sprayer and small bags of herbicide were also present. This shed also contained small wooden holding pens;
- Fibre cement sheeting (PACM) was identified on the southern side of the shed, with minor broken fragments on the ground;
- A four bay corrugated iron Lean To (feature 6) was attached to the shed, containing machinery associated with the cropping land use (i.e. tractors with sprayers);
- A small effluent pond was present north of the four bay Lean To;
- The south eastern corner of the Site contained a large stockpile of sand, and four small piles of gravelly fill material were present on the northern side of the sand stockpile; and
- The southern side of the large stockpile of sand was identified to be lower than the surrounding ground level. Several large piles of treated fence posts and timber were identified in this area, covering an area of 40 m x 10 m (approximately 400 m²).

3.4 Interview

A discussion with the existing Site manager Matt Carnachan was undertaken and identified the following:

- The Site has a history of dairy farming until circa 1950's, followed equine use till circa 2013 and cropping (asparagus and oats) from this time to present;
- Matt was not aware of any burn piles or farm dumping; and
- The large sand stockpile in the southeast of the Site was identified to be sourced from excavated material south of the pile, while the small piles of fill material were sourced from beneath the SH24 running parallel the northern boundary of the Site associated with road works undertaken over the last few years.

3.5 Site History Summary

Based on a review of publicly available information in relation to the history of the Site, the following can be summarised:

- Prior to the early 1940's the Site was in pasture and used for pastoral production, after which the Site was used for equine purposes from circa 1950's to circa 2013 followed by crop production (asparagus and oats) until present;
- Two depressions were identified near the western boundary of the Site and one in the centre of the Site from 1943 to prior to the mid 1960's. A fourth depression was identified near the centre of the Site from circa early 1980's to circa 1990;
- A farm building and adjoining animal pen area was present in the west of the Site from prior to the early 1940's with various expansions until removal circa 1990;
- Several small farm sheds were present and removed across the Site over the period of time of available information, while a dwelling was present in the northeast of the Site prior to the early 1940's and removed prior to the early 2000's;
- A dwelling was constructed in the north of the Site at a time prior to the mid 1960's, and still remains present onsite;
- Two farm sheds were constructed near the centre of the Site prior to the early 1940's, with one being removed circa 1990;
- Soil disturbance / earthworks were identified to have occurred in the southeast of the Site circa 1990; and
- At the time of the Site walkover, a large pile of treated fence posts and timber were stored in the south-east of the Site, while a large stockpile of sand and smaller piles of fill material (reportedly sourced from beneath SH24) were present in this area.

3.6 HAIL Assessment

Based on a review of the available information for the Site, and from the interview and Site walkover, the following potential HAIL activities have been undertaken:

- A8: *'Livestock dip or spray race operations'* associated with former intensive animal grazing in the south east and former farm building and adjoining animal pen area in the west; and
- 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'* associated with:
 - Two former depressions identified in the west and two in the centre of the Site;
 - Impact to soil from lead and asbestos at the location of the dwelling in the north of the Site;
 - Current wooden loading docks, which may have been used for the treatment of stock;
 - Broken PACM fragments on the ground at the location of the vat room and shed;
 - Former shed in the centre of the Site;
 - Fill material in the south-east of the Site; and

- Large piles of treated fence posts and timber in the south-east of the Site.

The HAIL activity A10: *'Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds'* is considered unlikely to have been undertaken at the Site, as the period of crop production identified (circa 2013-present) post-dates the use of persistent pesticide application in New Zealand. Furthermore, spray products identified at the Site are not persistent and are phosphate/sulphate based.

Any potential impacts (if present) associated with the potential degradation of historic building materials (lead based paint and ACM) and removal of the former dwelling and minor small sheds identified across the Site in the review of historic aerial photographs are considered highly unlikely to present a risk in light of the proposed industrial zoning and future subdivision, on the basis of the highly disturbed/mixed nature of the soils at the Site associated with tilling for cropping at the Site.

3.7 Initial Conceptual Site Model

An initial conceptual site model (CSM) has been prepared and is present below in Table 4. A CSM provides a detailed description of the identified potential sources, pathways and receptors, and a qualitative assessment of complete or potentially complete source-pathway-receptor (SPR) linkages. A risk is only present if there is a complete SPR linkage. The CSM detailed in Table 4 is based on the results of the background review only, and is intended to guide and inform the soil sampling and analysis.

Table 4: Initial Conceptual Site Model

| Source | Pathway | Receptor | Human Health & Environmental | Discussion | SPR Linkage |
|--------------------------------------|---|----------------------------------|------------------------------|---|--|
| Heavy metals in Soils | Direct contact, inhalation and/or ingestion | Maintenance / excavation Workers | Human Health | The background review of available information and initial Site walkover identified a number of potentially contaminating activities associated with the historic use of the Site. These activities were not generally identified to be widespread, but may however have the potential to result in the presence of various contaminants in soil, such as heavy metals, PAH, OCPs and asbestos. | Potentially Complete Determination of whether the SPR linkage is complete requires soil sampling and analysis to assess the concentrations of contaminants in soil, and a risk assessment to determine the potential risk to human health and the environment. |
| | | Site users | | | |
| Leaching to groundwater and/or river | Groundwater / River | Environmental | | | |
| PAH in Soils | Direct contact, inhalation and/or ingestion | Maintenance / excavation Workers | Human Health | | |
| | | Site users | | | |
| Leaching to groundwater and/or river | Groundwater/River | Environmental | | | |
| OCPs in Soils | Direct contact, inhalation and/or ingestion | Maintenance / excavation Workers | Human Health | | |
| | | Site users | | | |
| Leaching to groundwater and/or river | Groundwater/River | Environmental | | | |

| Source | Pathway | Receptor | Human Health & Environmental | Discussion | SPR Linkage |
|----------|--------------------------------------|----------------------------------|------------------------------|------------|-------------|
| Asbestos | Leaching to groundwater and/or river | Maintenance / excavation Workers | Environmental | | |
| | | Site users | | | |

4 SITE INVESTIGATION

4.1 Soil Sampling

On 13 October 2021, a total of 42 soil samples were collected from 18 locations across the Site at depths between 0.0-1.0 m bgl (refer to Figure 1 and Table 5). The targeted soil sampling was undertaken in general accordance with the Contaminated Land Guidelines No.5 Site Investigation and Analysis of Soils (MfE, 1999, revised 2021). The methodology for the soil sampling is set out below.

The rationale for sampling locations and an analytical suite of heavy metals, organochlorine pesticides (OCPs), polycyclic aromatic hydrocarbons (PAH), and asbestos is based on activities at the Site as identified in Section 3.6 above. Assuming a similar source material for the large sand stockpile and smaller piles of fill material in the southeast of the Site, 12 of the samples from these locations were composited into three composite samples (4:1) by the laboratory prior to analysis.

It should be noted that soil sample locations were based on initial development plans provided and a change of development plans has led to some soil sample locations outside of the Site boundary.

4.1.1 Sampling Methodology

The following methodology was adopted during the soil sampling works:

- A stainless-steel spade and hand auger were used to collect soil samples from 18 locations identified as SH24-01 to SH24-18 from depths ranging between 0.0-1.0 m bgl;
- Two bulk samples of fibre cement sheeting were collected from two locations around the halo of the vat room and shed;
- A clean pair of nitrile gloves were worn to place the soil sample within the sample jars, and bulk PACM samples in 200 micron bags to limit the potential for cross-contamination;
- Samples were placed in laboratory provided clean sample jars/bags and identified with a unique sample identifier, which was documented on the sample label; sample log; and chain of custody form;
- All soil samples were placed in an ice-cooled storage box (i.e. Chilly Bin) immediately after collection and transported under chain of custody documentation to the analytical laboratory;
- All field sampling equipment was decontaminated prior to use at each soil sample location to limit the potential for cross-contamination. Decontamination of field equipment involved: wash with clean potable water; scrubbing in a detergent solution (Decon® 90) and potable water; and a final rinse in clean water; and

The samples were transported under full Chain of Custody documentation to RJ Hill Laboratories, Hamilton. The soils were analysed as per the analytical schedule in Table 5. Sampling locations are presented in **Error! Reference source not found..**

Table 5. Soil Sampling Details and Laboratory Analytical Schedule

| Sample ID | Depth (m bgl) | Activity/Location | Soil Type | Lab Analysis |
|---------------------|---------------|------------------------------|-----------|--------------|
| Soil Samples | | | | |
| SH24-01 | 0.0-0.1 | Treated fence posts / timber | Grey sand | Arsenic |
| | 0.3 | | | Hold cold |
| SH24-02 | 0.0-0.1 | | Grey sand | Arsenic |
| | 0.3 | | | Hold cold |

| | | | | |
|--------------------------------------|---------|-----------------------------------|---------------------------------|---|
| SH24-03 (composite of a, b, c, d) | 0.0-0.3 | Fill material (from beneath road) | Brown sand with bark and gravel | Heavy metals, PAH, asbestos (semi-quantitative method) |
| SH24-04 (composite of a, b, c, d) | 0.0-1.0 | Sand stockpile | Brown sand with silt | Heavy metals, PAH |
| SH24-05 (composite of a, b, c, d) | 0.0-1.0 | | Brown sand with silt | Heavy metals, PAH |
| SH24-06 | 0.0-0.1 | Former intensive animal grazing | Brown sandy silt topsoil | Heavy metals, OCPs, asbestos (semi-quantitative method) |
| | 0.5 | | Light brown clayey silt | Hold cold |
| SH24-07 | 0.0-0.1 | | Brown sandy silt topsoil | Heavy metals, OCPs |
| | 0.5 | | Light brown clayey silt | Hold cold |
| SH24-08 | 0.0-0.1 | Shed (southern side) | Brown sand | Lead, asbestos (semi-quantitative method) |
| | 0.3 | | Brown sand | Hold cold |
| SH24-09 | 0.0-0.1 | Vat room (southern side) | Brown sand | Hold cold |
| | 0.3 | | Intermixed brown sand and silt | Hold cold |
| SH24-10 | 0.0-0.1 | Vat room (northern side) | Brown sand | Lead, asbestos (semi-quantitative method) |
| | 0.15 | | Dark brown sand with gravel | Hold cold |
| SH24-11 | 0.0-0.1 | Former shed | Brown gravelly sand | Lead, asbestos (semi-quantitative method) |
| SH24-12 | 0.0-0.1 | Former shed | Brown gravelly sand | Lead, asbestos (semi-quantitative method) |
| SH24-13 | 0.0-0.1 | Wooden stock loading yards (east) | Brown sand | Heavy metals, OCPs |
| SH24-14 | 0.0-0.1 | | Brown silty sand | Hold cold |

| | | | | |
|----------------------------------|--------------|--|--------------------------------------|---|
| | 0.15 | Wooden stock loading yards (west) | Grey sand with gravel | Hold cold |
| SH24-15 | 0.0-0.1 | Dwelling (northern side) | Sandy silt topsoil | Lead, asbestos (semi-quantitative method) |
| | 0.2 | | Brown sand | Hold cold |
| SH24-16 | 0.0-0.1 | Dwelling (southern side) | Brown sand | Hold cold |
| | 0.2 | | Brown sand with gravel | Hold cold |
| SH24-17 | 0.0-0.1 | Former farm building and adjoining animal pen area | Brown sandy silt topsoil with gravel | Heavy metals, OCPs, asbestos (semi-quantitative method) |
| | 0.25 | | Light brown clayey silt with gravel | Hold cold |
| SH24-18 | 0.0-0.1 | Former farm building and adjoining animal pen area | Brown sandy silt topsoil with gravel | Heavy metals, OCPs, asbestos (semi-quantitative method) |
| | 0.25 | | Light brown clayey silt with gravel | Hold cold |
| Bulk Fibre Cement Samples | | | | |
| Bulk-01 | Soil surface | Shed (southern side) | Fibre cement sheeting fragment | Asbestos in bulk material |
| Bulk-02 | | Vat room (northern side) | | |

4.1.2 QA/QC

Standard field quality assurance protocols were followed. All tools used for sampling were decontaminated and washed between samples to remove the risk of cross contamination. Nitrile gloves were also used and disposed of between each sample. Samples were analysed by Hill Laboratories, a New Zealand accredited laboratory (by International Accreditation NZ). Their primary quality standard is NZS/ISO/IEC 17025:2005 which incorporates the aspects of ISO 9000 relevant to testing laboratories. Refer to the laboratory analysis report in Appendix E for further information on accreditation.

4.1.3 Sampling Observations

Photos of the Site and typical soil profile are presented in Appendix D. The following soil characteristics and observations are described below:

Sample location SH24-01 and SH24-02:

- 0.0-0.25 m bgl: grey sand;
- 0.25 m bgl: coarser grey sand;

Sample location SH24-03:

- Small stockpiles with brown sand, bark, some gravel and concrete.

Sample location SH24-04 and SH24-05:

- Large brown sand stockpile.

Sample location SH24-06 and SH24-07:

- 0.0-0.5 m bgl: brown sandy silt topsoil;
- 0.5 m bgl: light brown clayey silt.

Sample location SH24-08:

- 0.0-0.5 m bgl: brown sand.

Sample location SH24-09:

- 0.0-0.25 m bgl: brown sand;
- 0.25 m bgl: brown silty sand.

Sample location SH24-10:

- 0.0-0.15 m bgl: brown sand;
- 0.15 m bgl: dark brown sand with gravel.

Sample location SH24-11 and SH24-12:

- 0.0-0.1 m bgl: brown gravelly sand, gravel refusal at depth .

Sample location SH24-13:

- 0.0-0.15 m bgl: brown sand, gravel refusal at depth.

Sample location SH24-14:

- 0.0-0.15 m bgl: brown silty sand;
- 0.15 m bgl: grey sand with gravel.

Sample location SH24-15:

- 0.0-0.2 m bgl: brown sandy silt topsoil;
- 0.2 m bgl: brown sand.

Sample location SH24-16:

- 0.0-0.2 m bgl: brown sand;
- 0.2 m bgl: brown sand.

Sample location SH24-17 and SH24-18:

- 0.0-0.25 m bgl: brown sandy silt topsoil with gravel;
- 0.25 m bgl: light brown clayey silt with gravel.

PACM was identified in direct contact with soil on the northern side of the vat room and southern side of the shed and no other visual or olfactory signs of contamination were present.

Although not sampled, soils at the locations of the four former depressions were investigated via hand auger excavation. No fill material or refuse was identified at any of the former depression locations and soil characteristics are described as:

- 0.0-0.5 m bgl: brown sandy silt topsoil;
- 0.5-0.7 m bgl: light brown clayey silt; and
- 0.7 m bgl light brown sandy silt.

4.2 Evaluation Criteria

The soil sample results have been screened against the following criteria:

- NESCS Soil Contaminant Standards (SCS) using the 'Commercial/industrial' land use scenario. This is consistent with the proposed land use;

- Australian National Environmental Protection (Assessment of Site Contamination) Measure (NEPM) – commercial/industrial health investigation level (adopted for nickel and zinc in accordance with the hierarchy of CLMG No.2 in the absence of published SCS in the NESCS);
- Ministry for the Environment (MfE – revised 2011) Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand (MfE Petroleum Guidelines) – All Pathways Criteria for the commercial/industrial land use and Maintenance/excavation workers using values for sand soil type. These guidelines are a composite of the limiting (or lowest value) acceptance criteria concentrations drawn from the following:
 - The inhalation, soil ingestion, dermal and produce ingestion pathway criteria; and
 - Criteria developed to be protective of subsurface maintenance/excavation workers (based on soil ingestion, dermal absorption and inhalation exposure pathways).
- Background concentrations for heavy metals (95% upper limit) as presented on the WRC website. These values are used as a guideline for typical naturally occurring concentrations in the Waikato Region;
- WRC Cleanfill Criteria. These criteria were selected to provide guidance on suitable offsite disposal options, if required; and
- New Zealand Guidelines for Assessing and Managing Asbestos in Soil (GAMAS) 2017, using the commercial and industrial land use scenario for ACM and the ‘all’ land use scenario for asbestos fines and fibrous asbestos.

4.3 Results

A summary of the laboratory results is presented in Table 6. The full results are contained in the laboratory analysis report provided in Appendix E. The following is noted:

- The concentrations of heavy metals detected in all samples analysed were below the NESCS SCS for the commercial / industrial outdoor worker (unpaved) land use scenario, and below the adopted NEPM criteria for nickel and zinc;
- Heavy metals exceeded background concentrations in several samples:
 - Arsenic in samples SH24-01_100 (26 mg/kg) and SH24-02_100 (43 mg/kg) at the location of the large pile of treated fence posts and timber exceeded WRC Cleanfill criteria (17 mg/kg) and therefore background concentrations;
 - Arsenic in sample SH24-06_100 (26 mg/kg) also exceeded WRC Cleanfill criteria at the location of the former intensive animal grazing. Cadmium and zinc in this sample and Arsenic, cadmium and zinc in sample SH24-07_100 also exceeded background levels at this former intensive animal grazing area;
 - Zinc in sample SH24-13_100 exceeded background levels at the wooden stock loading yards;
 - Lead in sample SH24-15_100 exceeded background levels at the current dwelling;
 - Cadmium in sample SH24-17_100 exceeded background levels at the farm building and adjoining animal pen area.
- A range of PAH compounds were detected in the composite sample SH24-03 taken from fill material (from beneath the road), with total PAH at 0.5 mg/kg;
- 4,4'-DDE and 4,4'-DDT were detected in samples SH24-06 and SH24-07 at the location of the former intensive animal grazing. Total DDT isomers were also detected at 0.1 mg/kg and 0.19 mg/kg respectively, below the WRC Cleanfill criteria (0.7 mg/kg);
- No asbestos was detected in any of the soil samples submitted for analysis; and
- Fibre cement sheet sample Bulk-02 was confirmed to contain chrysotile (white asbestos), collected from the ground at the northern side of the vat room.

5 CONCEPTUAL SITE MODEL

A conceptual site model (CSM – Table 7) provides a detailed description of the identified potential sources, pathways and receptors, and a qualitative assessment of complete or potentially complete source-pathway-receptor (SPR) linkages. A risk is only present if there is a complete SPR linkage. The CSM detailed in Table 7 is not intended to be an exhaustive assessment of all potential SPR linkages. The CSM has been developed based on available information, any omissions are not indicative of no risk.

Table 7. Conceptual Site Model

| Source | Pathway | Receptor | Human Health & Environmental | Discussion | SPR Linkage |
|------------------------------------|---|---------------------|------------------------------|---|--|
| Heavy metals in Soils | Direct contact, inhalation and/or ingestion | Site users | Human Health | Heavy metals in all soil samples are below the NESCS SCS for the commercial/industrial outdoor worker (unpaved) land use scenario and NEPM guidelines for nickel and zinc. | Incomplete Concentrations of heavy metals do not exceed the NESCS assessment criteria for the proposed Site use (commercial / industrial land use). |
| | Leaching to groundwater and/or river | Groundwater / River | Environmental | No assessment of groundwater or leachable concentration of heavy metals has been undertaken (by Toxicity Characteristic Leaching Procedure (TCLP). The closest surface water body is the Mangawhero Stream located in the southeast of the Property, approximately 70 m southeast of the Site. The depth of shallow groundwater is likely to be < 10 m bgl. | Highly Unlikely Although no sub-surface samples were analysed for heavy metals, all heavy metals are not considered to be at levels which pose a risk to environmental receptors. Additionally, heavy metals typically bind to soil and are generally considered immobile in shallow soils; therefore, the potential for offsite discharge is considered highly unlikely. It is considered unlikely that concentrations of heavy metals pose a leachable risk to groundwater or nearby surface water bodies. |
| Organochlorine Pesticides in Soils | Direct contact, inhalation and/or ingestion | Site users | Human Health | 4,4'-DDE and 4,4'-DDT (and therefore total DDT Isomers) were detected at the former intensive animal grazing area in the southeast of the Site, below the adopted human health assessment criteria. | Incomplete Concentrations of OCPs do not exceed the adopted human health criteria. |

| Source | Pathway | Receptor | Human Health & Environmental | Discussion | SPR Linkage |
|---|---|---------------------|------------------------------|---|---|
| | Groundwater / River | Environmental | Environmental | No groundwater / surface water monitoring has been undertaken as part of these works. However, low concentrations in soil while not indicative of no risk to groundwater would indicate that the likelihood or risk to groundwater / surface water is low. | Highly Unlikely Total DDT Isomers detected at the former intensive animal grazing area (0.1 mg/kg and 0.19 mg/kg) were well below WRC Cleanfill criteria (0.7 mg/kg), and therefore are considered highly unlikely to be at concentrations that would pose a leachable risk to groundwater / nearby surface water bodies. |
| Polycyclic aromatic Hydrocarbons in Soils | Direct contact, inhalation and/or ingestion | Site users | Human Health | PAH was identified in fill material (from beneath the road) in the southeast of the Site, below the adopted human health assessment criteria. | Incomplete Concentrations of PAH do not exceed the adopted human health criteria. |
| | Leaching to groundwater and/or river | Groundwater / River | Environmental | No groundwater / surface water monitoring has been undertaken as part of these works. However, low concentrations in soil while not indicative of no risk to groundwater would indicate that the likelihood or risk to groundwater / surface water is low. | Highly Unlikely The concentrations of PAHs are below the WRC Cleanfill criteria and therefore are considered highly unlikely to be at concentrations that would pose a leachable risk to groundwater / nearby surface water bodies. |
| Asbestos in Soils | Inhalation | Site Users | Human Health | Although asbestos was detected in a fibre cement sheet fragment (located north of the vat room), asbestos was not detected in any of the soil samples analysed. | Incomplete No asbestos was detected in soil. |

6 DISCUSSION

A review of historic aerial photographs identified an area of intensive animal grazing in the southeast of the Site from prior to the early 1940's to the mid 1960's. Heavy metals (arsenic, cadmium and zinc) were identified above background levels at this location (with arsenic exceeding WRC Cleanfill criteria in one surface sample) while DDT Isomers were also detected. Based on the detection of OCP's within that particular area it has been identified that there may be residual contamination in shallow soils from historic pesticide treatment of animals, however utilising a multiple lines of evidence approach it is considered unlikely that HAIL activity A8: *'Livestock dip or spray race operations'* applies to the area on the following basis:

- No structures have been identified within historic aerials that indicate a dipping or spray race operation;
- No structures were identified during sampling activities which extended up to 0.5 m bgl within the area of concern. Additionally, tilling has routinely been conducted across the Site which has mixed topsoil to a depth of 0.5 m bgl. As the whole of this area has historically been tilled this indicates that the potential for buried structures associated with dip activities to be highly unlikely; and
- The concentrations of OCP's identified only slightly exceeded laboratory detection limits and were well below WRC regional background levels.

Fibre cement sheet fragments were confirmed to contain chrysotile (white asbestos) in a small discrete area on the ground directly north of the vat room at the Site associated with some minor damage/degradation to the vat room cladding. A soil sample collected in the general vicinity of the ACM fragments did not detect asbestos. Due to the number of ACM fragments, the amount of damage to the buildings and the soil sampling results soils are considered highly unlikely present a risk to human health associated with the proposed industrial landuse and development. It is recommended that an asbestos survey undertaken prior to demolition of the vat room and shed (if required), and any fragments are removed by a licenced asbestos removalist or competent person along with any other ACM identified within the buildings.

Arsenic was identified to exceed WRC Cleanfill criteria in the two soil samples collected from beneath the large area of treated fence posts / timber in the southeast of the Site and is considered to be associated with this activity. However, the concentrations at these locations were well below the adopted human health criteria. Furthermore, arsenic also exceeded WRC Cleanfill criteria in a soil sample collected from fill material near this area reportedly sourced from the nearby road.

Although soil samples were not collected or analysed from the four former depressions at the Site, soils at the locations of each of the depressions were investigated via hand auger excavation and no fill material or refuse was identified at any of these locations.

All activities investigated are not considered to meet the definition of HAIL activity 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'* on the basis of visual observations and all soil sampling analytical results were below the adopted human health criteria, therefore not present in sufficient quantity that it could be a risk to human health or the environment.

This assessment has determined that the risk to human health associated with the proposed industrial subdivision is highly unlikely. As no HAIL activities have been identified at the Site, the NESCS does not apply to the Site as it does not meet the definition of subclause 5(7). No contamination has been identified as part of this investigation that presents a risk to the environment or human health requiring remediation, therefore it is considered that the contaminated land rules within Section 5.3 of the WRP do not apply to the Site.

7 CONCLUSIONS

4Sight Consulting Ltd (4Sight) has been engaged by Veros Ltd ('the Client') to undertake a Combined Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) at 194 SH24, Matamata (herein referred to as 'the Property'). This investigation has focused on the area of the Property proposed for industrial plan change and future subdivision ('the Site').

The objectives of the Combined PSI & DSI are to determine whether an activity or industry listed on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) is being, has been, or is likely to have been conducted at the Site, to determine concentrations of contaminants in soil through targeted sampling, and to assess potential implications for the proposed future industrial subdivision under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) (MfE, 2011), and the Waikato Regional Plan (WRP).

This Combined PSI & DSI included reviewing the Site's history, soil sampling, and field observations. The key findings are:

- Prior to the early 1940's the Site was in pasture and used for pastoral production, after which the Site was used for equine purposes from circa 1950's to circa 2013 followed by crop production (asparagus and oats) until present;
- Several small farm sheds were present across the Site from the early 1940's, while a dwelling was present in the northeast of the Site prior to the early 1940's and removed prior to the early 2000's. A second dwelling was constructed in the north of the Site at a time prior to the mid 1960's, and still remains present onsite at the time of this investigation;
- A farm building and adjoining animal pen was present in the west of the Site from prior to the early 1940's with various expansions until removal circa 1990. An area of intensive animal grazing was identified in the southeast from prior to the early 1940's to the mid 1960's;
- Two surface depressions were identified near the western boundary of the Property and one in the centre of the Site from 1943 to prior to the mid 1960's. A fourth depression was identified near the centre of the Site from circa early 1980's to circa 1990. None of these were visible during the Site walkover;
- Soil disturbance / earthworks were identified to have occurred in the southeast of the Property from circa 1990;
- At the time of the Site walkover, a large pile of treated fence posts and timber was identified in the southeast of the Property, and a large stockpile of sand and smaller stockpiles of fill material sourced from roadworks on SH24 were also identified in this area;
- A change in development plans following the Site investigation has led to some features investigated being outside of the Site boundary (two former depressions, stockpiles of material and large pile of treated fence posts);
- Soil sampling involved the collection of 42 soil samples from 18 targeted locations at depths between 0.0-1.0 meters (m) below ground level (bgl) and two bulk samples of fibre cement sheeting were collected from where potential asbestos containing material (PACM) was identified around the halo of the vat room and shed. The results identified:
 - The concentrations of heavy metals detected in all samples analysed were below the NESCS SCS for the commercial / industrial outdoor worker (unpaved) land use scenario, and below the adopted NEPM criteria for nickel and zinc;
 - Heavy metal concentrations exceeded typical background concentrations in several samples, while arsenic exceeded Waikato Regional Council (WRC) Cleanfill Criteria beneath a large pile of treated fence posts and timber, and within the former intensive animal grazing area;
 - A range of polycyclic aromatic hydrocarbon (PAH) compounds were detected in the composite sample SH24-03 taken from fill material (sourced from beneath SH24), with total PAH at 0.5 mg/kg;
 - 4,4'-DDE and 4,4'-DDT were detected in samples SH24-06 and SH24-07 at the location of the former intensive animal grazing. Total DDT isomer concentrations at these locations were 0.1 mg/kg and 0.19 mg/kg respectively, below the WRC Cleanfill criteria (0.7 mg/kg);
 - No asbestos was detected in any of the soil samples submitted for analysis; and

- Fibre cement sheet sample Bulk-02 was confirmed to contain chrysotile (white asbestos), collected from the ground at the northern side of the vat room.
- Using a multiple lines of evidence approach it is considered unlikely that HAIL activity A8 ‘Livestock dip or spray race operations’ at the location of the area of intensive animal grazing applies to the area on the following basis:
 - No structures have been identified within historic aerials that indicate a dipping or spray race operation;
 - No structures were identified during sampling activities which extended up to 0.5 m bgl within the area of concern. Additionally, tilling has routinely been conducted across the Site which has mixed topsoil to a depth of 0.5 m bgl. As the whole of this area has historically been tilled this indicates that the potential for buried structures associated with dip activities to be highly unlikely; and
 - The concentrations of OCP’s identified only slightly exceeded laboratory detection limits and were well below WRC regional background levels.
- Soil sampling confirmed that ACM associated with the farm buildings is considered highly unlikely to have impacted soils in the vicinity of the vat room, with the exception of a very small area directly beneath ACM fragments;
- Although soil samples were not collected or analysed from the four former depressions at the Site and Property, soils at the locations of each of the depressions were visually investigated with no fill material or indicators of contamination identified at any of these locations; and
- Based on the above set of criteria, and that all soil sampling analytical results were below the adopted human health criteria, it is considered highly unlikely that HAIL activity I has occurred at the Site (*‘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’*). This is on the basis that hazardous substances need to be present in sufficient quantity to present a risk to human health or the environment, and there was no evidence of this.

Based on the findings of this Combined PSI & DSI, the following recommendations are made:

- This Combined PSI & DSI has confirmed that soils across the Site are suitable for the proposed industrial land use and future subdivision and are considered highly unlikely to present a risk to human health or the environment;
- The NESCS does not apply to the Site as it does not meet the definition of subclause 5(7), specifically there is no evidence of HAIL activities at the Site;
- Minor ACM fragments on surface soils at the northern side of the vat room should be removed by a licenced asbestos removalist or competent person. Prior to the demolition of the vat room and other farm buildings an asbestos demolition survey should be undertaken to identify all potential ACM present within the buildings;
- No contamination has been identified as part of this investigation that presents a risk to the environment or human health requiring remediation, therefore it is considered that the contaminated land rules within Section 5.3 of the WRP do not apply to the Site.

7.1 SQEP Statement

I Aaron Graham of 4Sight Consulting Limited certify that this PSI meets the requirements of the NESCS because it has been:

- Reviewed by a suitably qualified and experienced practitioner (SQEP);
 - Evidence of my qualifications as a SQEP include the completion of a Post Graduate Diploma in Environmental Science and 13 years of experience in environmental management, eight of which specialising in contaminants land management.
- The report has been prepared in general accordance with CLMG No. 1 (revised 2021).

This Combined PSI & DSI has stated that the provisions of the NESCS do not apply to the Site.

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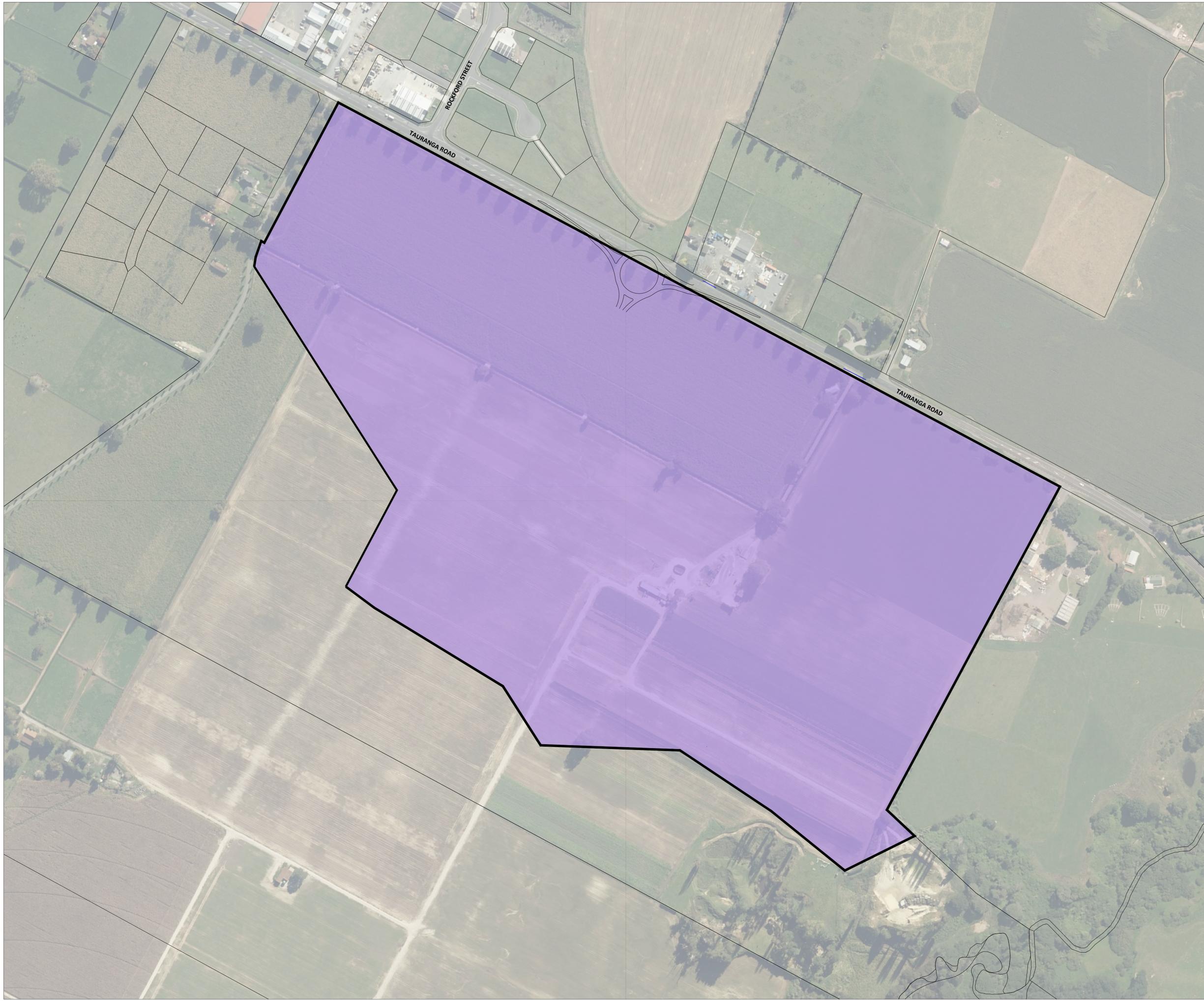
LIMITATIONS

This document does not include any assessment or consideration of potential health and safety issues under the Health and Safety at Work Act 2015. 4Sight Consulting has relied upon information provided by the Client and other third parties to prepare this document, some of which has not been fully verified by 4Sight Consulting. This document may be transmitted, reproduced or disseminated only in its entirety.

From a technical perspective, the subsurface environment at any Site may present substantial uncertainty. It is a heterogeneous, complex environment, in which small subsurface features or changes in geologic conditions can have substantial impacts on water, vapour and chemical movement. 4Sight Consulting's professional opinions are based on its professional judgement, experience, and training. This document was prepared based on information provided by others. Should additional information become available, this report should be updated accordingly.

Appendix A:

Plans



Key.

 Plan Change Boundary

 Proposed General Industrial Zone
(41.4 Hectares)

| Rev | Date | Issued for | Drawn |
|-----|----------|-------------|-------|
| D | 22.10.21 | Information | TM |
| C | 21.10.21 | Information | TM |
| B | 19.10.21 | Information | TM |
| A | 11.10.21 | Information | TM |



Calcutta Matamata

Client

Employment Zone

Job Name

Structure Plan

Drawing Title

CL-02

Drawing Number

D

Revision



Scale 1:4000 @ A3 1:2000 @ A1

Appendix B:

LUIR

Aaron Graham

From: Guy Sowry <Guy.Sowry@waikatoregion.govt.nz>
Sent: Tuesday, 31 August 2021 11:14 am
To: Jarrod Hall
Subject: Land Use Information Register enquiry 0 Tauranga Road, Matamata (REQ177504)
LUI11961

Dear Jarrod

Thank you for your enquiry regarding information the Waikato Regional Council may hold relating to potential contamination at the property indicated below:

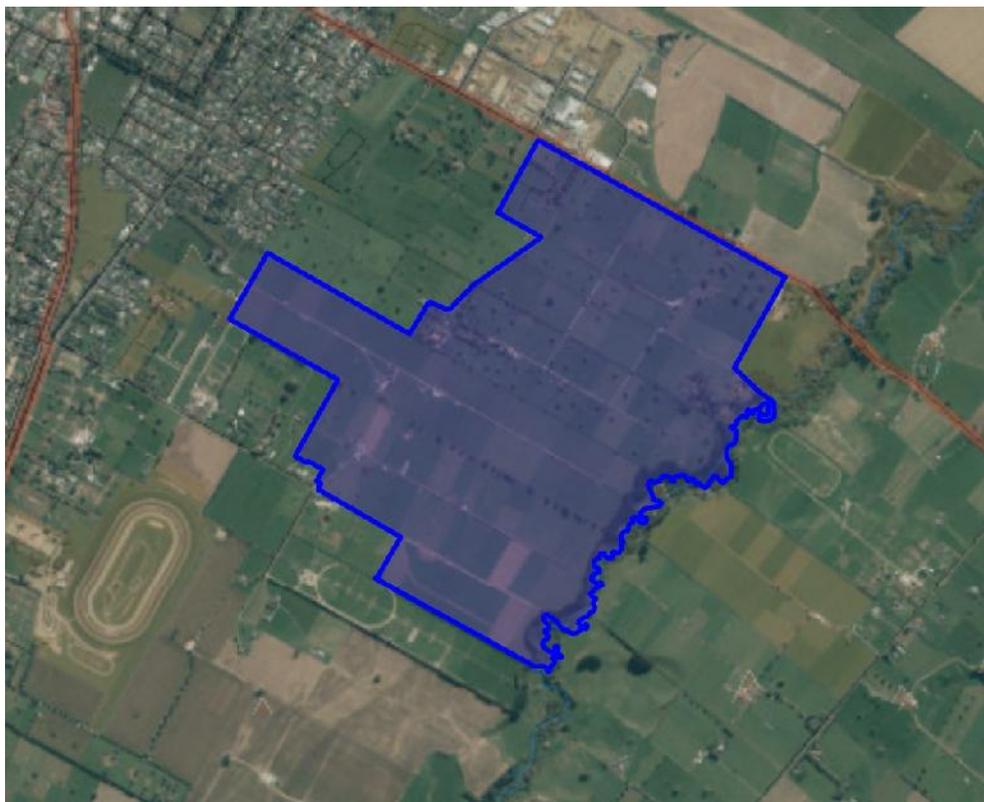
0 Tauranga Road, Matamata: Lot 11 DP 548170 Lot 200 DP 548170 (VRN 05320/139/31)



Background: The Waikato Regional Council maintains a register of properties known to be contaminated on the basis of chemical measurements, or potentially contaminated on the basis of past land use. This register (called the Land Use

Information Register) is still under development and should not be regarded as comprehensive. The 'potentially contaminated' category is gradually being compiled with reference to past or present land uses that have a greater than average chance of causing contamination, as outlined in the Ministry for the Environment's Hazardous Activities and Industries List (HAIL): <http://www.mfe.govt.nz/sites/default/files/hazards/contaminated-land/is-land-contaminated/hazardous-activities-industries-list.pdf>

This property: I can confirm that this site **does** appear on the Land Use Information Register as part of a wider site as identified by the area shaded blue on the map below:



The area outlined by blue above appears on the Land Use Information Register as **LUI11961** with a classification of 'Unverified HAIL – no sampling' due to current land use for HAIL activity 'A10. Persistent pesticide bulk storage or use' associated with Kaimai Fresh Limited.

This site is included on the register for land use information only; we do not hold soil investigation reports regarding the presence or otherwise of hazardous substances in the soil.

District Councils: Our records are not integrated with those of territorial authorities, so it would also be worth contacting the Matamata Piako District Council to complete your audit of Council records if you have not already done so. In general, information about known contaminated land will be included on a property LIM produced by the territorial authority.

Rural Land Considerations: Examples of sites that are "more likely than not" to have soil contamination (HAIL sites) include timber treatment activities, service stations and/or petroleum storage, panel beaters, spray painters, etc. Whilst pastoral farming is not included on this list, typical farming activities of horticulture, sheep dipping, chemical storage, petroleum storage and workshops are; but are more difficult to identify and may not be as well represented on the Land Use Information Register. Therefore, individuals interested in pastoral land may be interested in completing further investigations in accordance with Ministry for the Environment Guidelines prior to land purchase and/or development.

Additional Information: Please note that:

- Significant use of lead-based paint on buildings can, in some cases, pose a contamination risk; the use of lead-based paint is not recorded on the Land Use Information Register.
- Buildings in deteriorated or derelict condition which contain asbestos can result in asbestos fibres in soil; the use of asbestos in building materials is not recorded on the Land Use Information Register.
- The long term, frequent use of superphosphate fertilisers can potentially result in elevated levels of cadmium in soil; the use of superphosphate fertiliser is not recorded on the Land Use Information Register.
- We are not currently resourced to fully incorporate historic aerial photographs in our region-wide assessment of HAIL activities. A significant proportion of the Crown historical aerial image archive for the Waikato region is available to view free of charge at <http://retrolens.nz/>. We recommend this resource is consulted for any HAIL assessment.
- Due to the large volume of enquiries being received, we may not be able to respond to your enquiry as quickly as previously. We are resourced to meet 20 day response times as per LGOIMA, but endeavour to respond more quickly when workload permits. If your enquiry is urgent, please note this first in your enquiry and we will do our best to assist.

Please feel free to contact me if you have any further queries on this matter. For any new enquiries or requests for information please continue to use the [Request for Service form](#) for 'Contaminated Land/HAIL.'

Kind regards

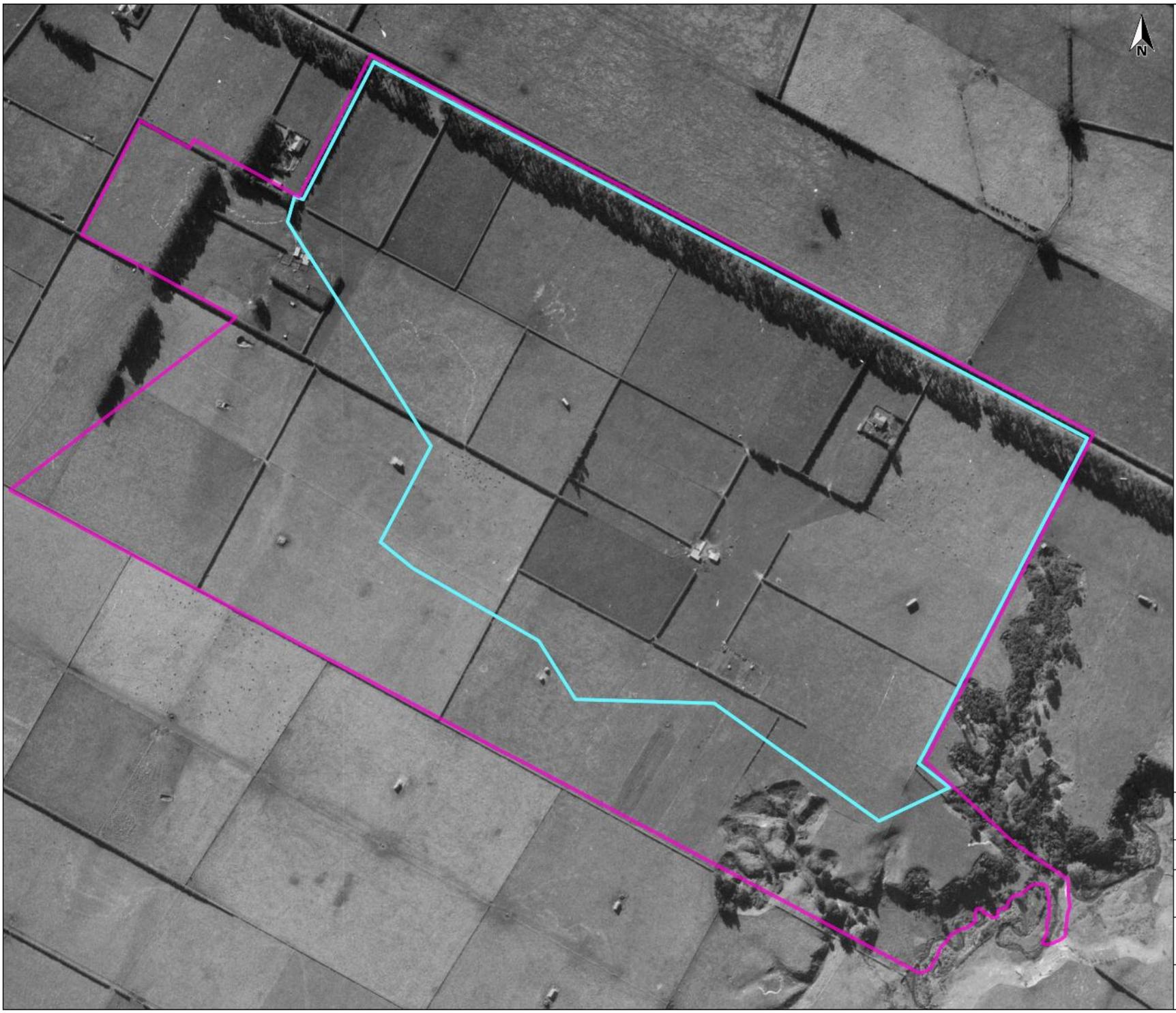
Guy

Guy Sowry | CONTRACTOR | Land and Soil, Science and Strategy
 WAIKATO REGIONAL COUNCIL | Te Kaunihera ā Rohe o Waikato
 P: +6478592839
 F: facebook.com/waikatoregion
 Private Bag 3038, Waikato Mail Centre, Hamilton, 3240

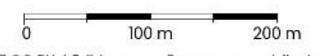
This email message and any attached files may contain confidential information, and may be subject to legal professional privilege. If you have received this message in error, please notify us immediately and destroy the original message. Any views expressed in this message are those of the individual sender and may not necessarily reflect the views of Waikato Regional Council. Waikato Regional Council makes reasonable efforts to ensure that its email has been scanned and is free of viruses, however can make no warranty that this email or any attachments to it are free from viruses.

Appendix C:

Historic Aerial Photographs



- Legend**
- Property Boundary
 - Site Boundary



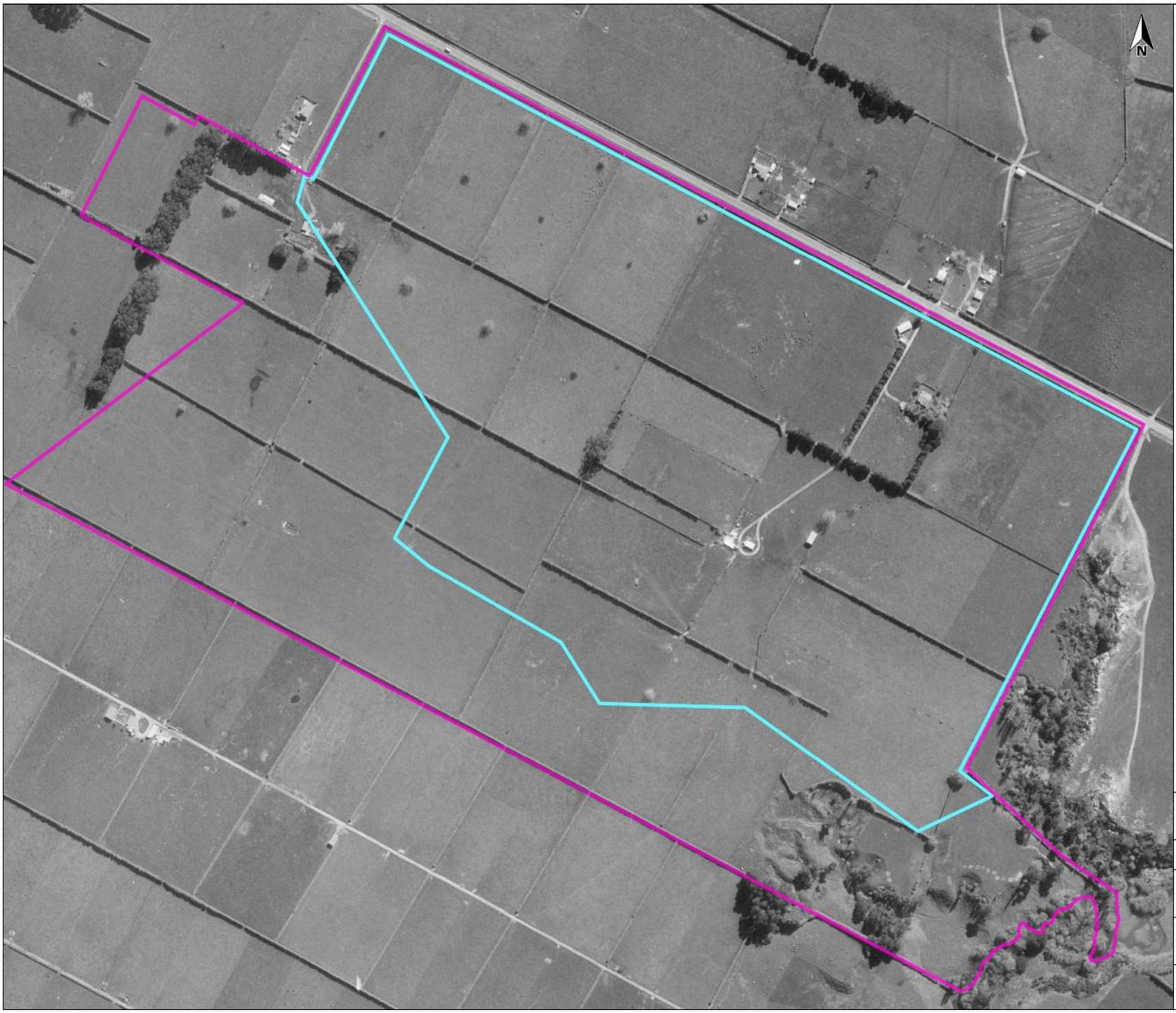
LINZ CC BY 4.0 © Imagery Basemap contributors



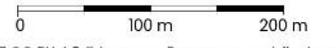
Produced by **Datanest.earth**

Title: Aerial Photograph of the Site Taken in 1943

| | | |
|---|---------------|-----------------------------|
| Client: Veros Ltd | | Figure No: 1943 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:7532 | |



- Legend**
- Property Boundary
 - Site Boundary



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Produced by **Datanest.earth**

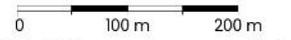
Title: Aerial Photograph of the Site Taken in 1966

| | | |
|---|---------------|--------------------|
| Client: Veros Ltd | | Figure No: 1966 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Size: A4 |
| Proj No: 9062 | Scale: 1:7174 | Version: Final |



Legend

- Property Boundary
- Site Boundary



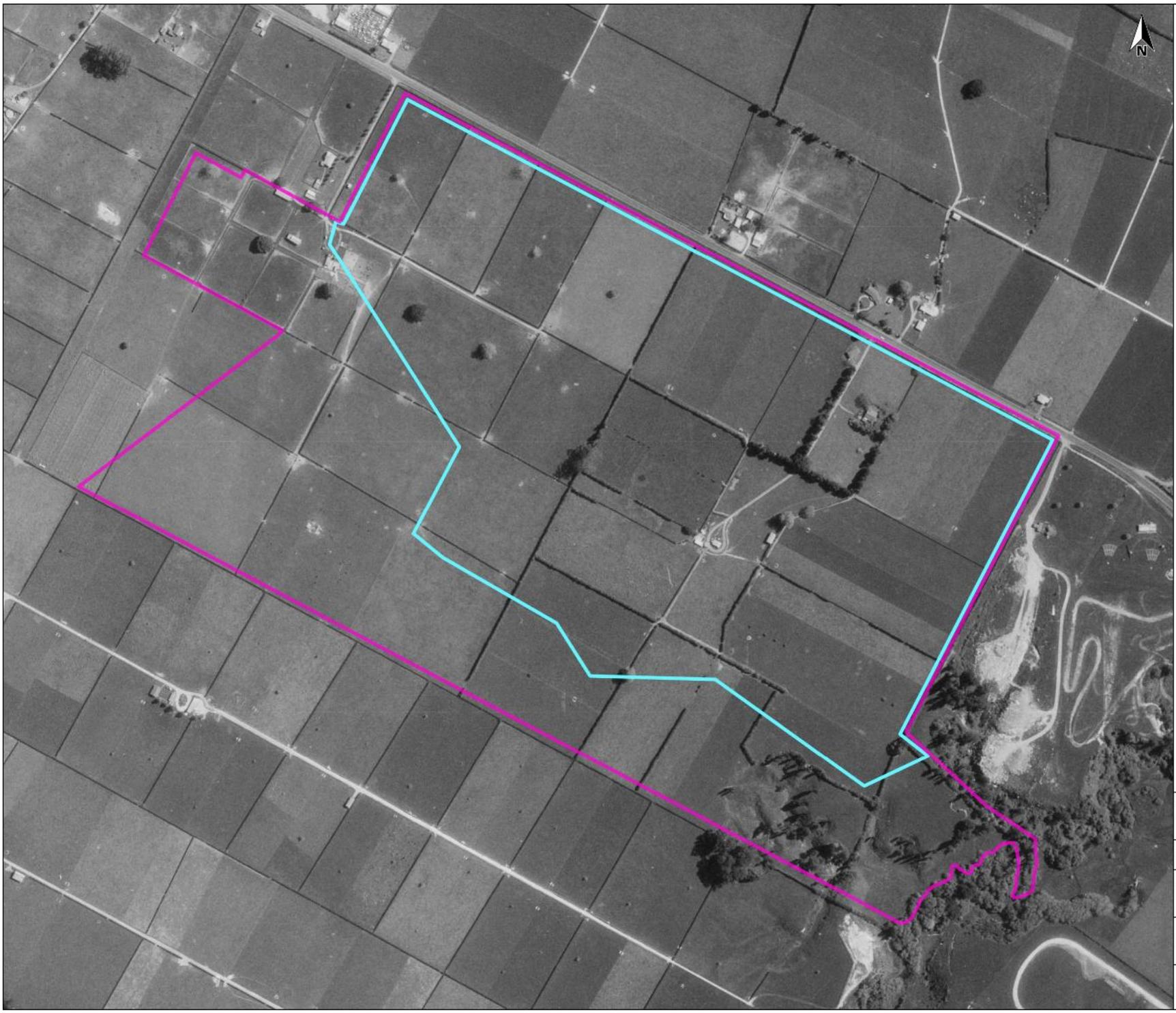
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by **Datanest.earth**

Title: Aerial Photograph of the Site Taken in 1974

| | | |
|---|---------------|--------------------------------|
| Client: Veros Ltd | | Figure No: 1974 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:8608 | |



Legend

- Property Boundary
- Site Boundary



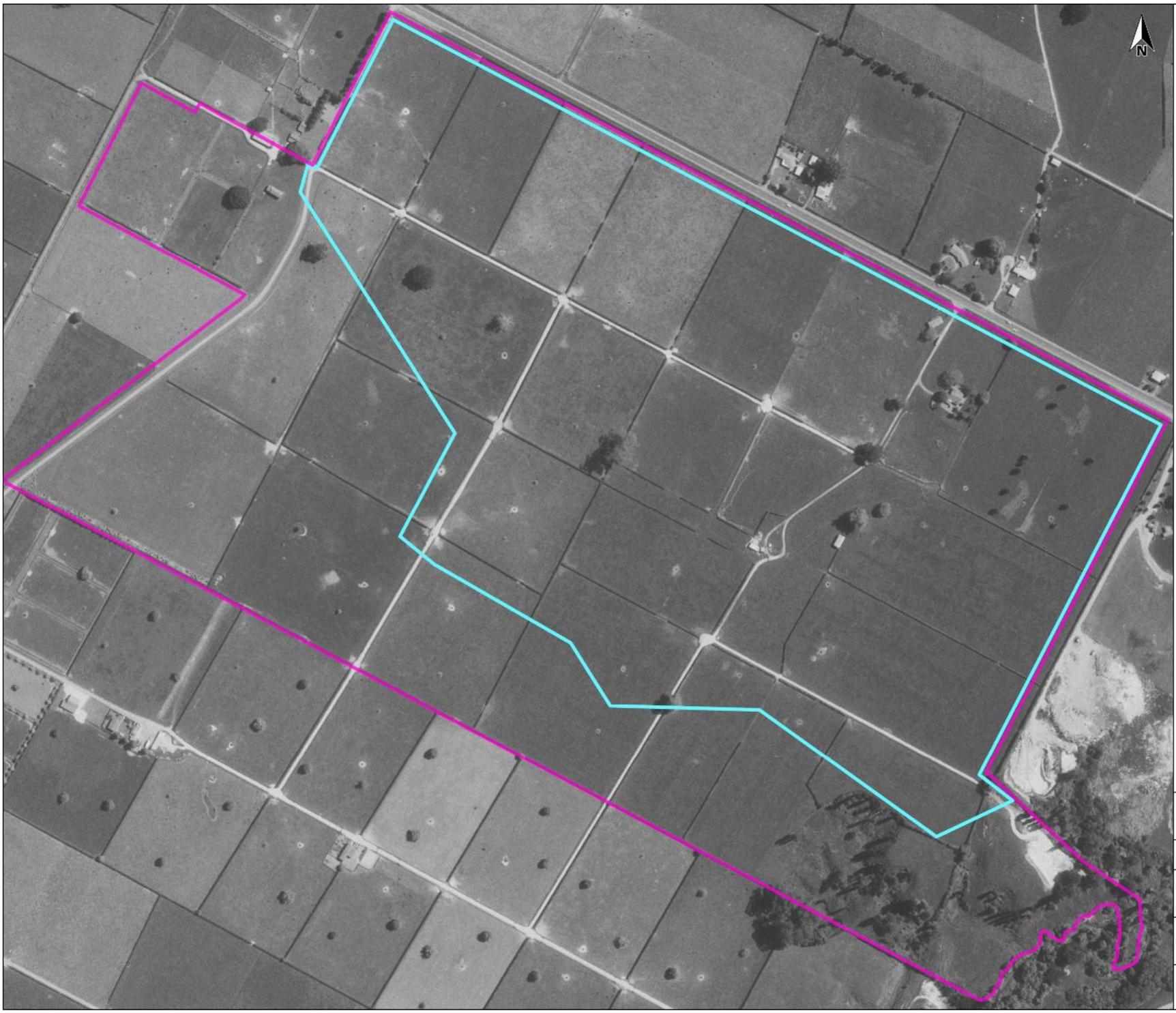
LINZ CC BY 4.0 © Imagery Basemap contributors



Produced by **Datanest.earth**

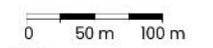
Title: Aerial Photograph of the Site Taken in 1981

| | | |
|---|---------------|--------------------|
| Client: Veros Ltd | | Figure No: 1981 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Size: A4 |
| Proj No: 9062 | Scale: 1:8329 | Version: Final |



Legend

- Property Boundary
- Site Boundary



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Produced by **Datanest.earth**

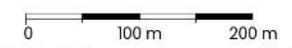
Title: Aerial Photograph of the Site Taken in 1990

| | | |
|---|---------------|--------------------------------|
| Client: Veros Ltd | | Figure No: 1990 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:7000 | |



Legend

- Property Boundary
- Site Boundary



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Produced by **Datanest.earth**

Title: Aerial Photograph of the Site Taken in 1995

| | | |
|---|---------------|-----------------------------|
| Client: Veros Ltd | | Figure No: 1995 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:8400 | |



Legend

- Property Boundary
- Site Boundary



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Produced by **Datanest.earth**

Title: Aerial Photograph of the Site Taken in 2003

| | | |
|---|----------------|-----------------------------|
| Client: Veros Ltd | | Figure No: 2003 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | |
| Proj No: 9062 | Scale: 1:7500 | |
| | Version: Final | |



Legend

- Property Boundary
- Site Boundary



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Produced by **Datanest.earth**

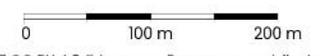
Title: Aerial Photograph of the Site Taken in 2013

| | | |
|---|---------------|-----------------------------|
| Client: Veros Ltd | | Figure No: 2013 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:7500 | |



Legend

- Property Boundary
- Site Boundary



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Produced by **Datanest.earth**

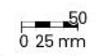
Title: Aerial Photograph of the Site Taken in 2016

| | | |
|---|---------------|-----------------------------|
| Client: Veros Ltd | | Figure No: 2016 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:7500 | |



Legend

- Property Boundary
- Site Boundary



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Produced by **Datanest.earth**

Title: Aerial Photograph of the Site Taken in 2021

| | | |
|---|---------------|--------------------------------|
| Client: Veros Ltd | | Figure No: 2021 Size: A4 |
| Project: SH24 Matamata Industrial Subdivision PSI | Drawn: JH | |
| Date: 18-10-2021 | Checked: AG | Version: Final |
| Proj No: 9062 | Scale: 1:2682 | |

Appendix D:

Site Photographs



Photo 1: Western section of the Site looking east



Photo 2: Stock loading yards



Photo 3: Implement shed



Photo 4: Vat room



Photo 5: ACM fragments on the north side of the vat room



Photo 6: Shed to the west of the vat room



Photo 7: Dwelling in the north of the Site.



Photo 8: Large piles of treated fence posts / timber



Photo 9: Small stockpiles of fill material from beneath the road



Photo 10: Large stockpile of sand material

Appendix E:

Laboratory Analytical Reports



Certificate of Analysis

Page 1 of 4

| | | | | |
|-----------------|--|--------------------------|---------------|------|
| Client: | 4Sight Consulting Limited | Lab No: | 2735407 | SPV1 |
| Contact: | Jarrold Hall C/- 4Sight Consulting Limited DX BOX HP40007 Tauranga 3112 | Date Received: | 14-Oct-2021 | |
| | | Date Reported: | 20-Oct-2021 | |
| | | Quote No: | 97403 | |
| | | Order No: | 9062 | |
| | | Client Reference: | SH24 Matamata | |
| | | Submitted By: | Jarrold Hall | |

Sample Type: Soil

| Sample Name: | SH24-01_100 | SH24-02_100 | SH24-06_100 | SH24-07_100 | SH24-08_100 |
|--------------|-------------|-------------|-------------|-------------|-------------|
| | 13-Oct-2021 | 13-Oct-2021 | 13-Oct-2021 | 13-Oct-2021 | 13-Oct-2021 |
| Lab Number: | 2735407.1 | 2735407.3 | 2735407.17 | 2735407.19 | 2735407.21 |

Individual Tests

| | | | | | | |
|---------------------------|----------------|----|----|----|----|-----|
| Dry Matter | g/100g as rcvd | - | - | 64 | 67 | - |
| Total Recoverable Arsenic | mg/kg dry wt | 26 | 43 | - | - | - |
| Total Recoverable Lead | mg/kg dry wt | - | - | - | - | 7.0 |

Heavy Metals, Screen Level

| | | | | | | |
|----------------------------|--------------|---|---|------|------|---|
| Total Recoverable Arsenic | mg/kg dry wt | - | - | 26 | 10 | - |
| Total Recoverable Cadmium | mg/kg dry wt | - | - | 0.51 | 0.63 | - |
| Total Recoverable Chromium | mg/kg dry wt | - | - | 6 | 5 | - |
| Total Recoverable Copper | mg/kg dry wt | - | - | 16 | 21 | - |
| Total Recoverable Lead | mg/kg dry wt | - | - | 14.5 | 12.8 | - |
| Total Recoverable Nickel | mg/kg dry wt | - | - | 4 | 4 | - |
| Total Recoverable Zinc | mg/kg dry wt | - | - | 78 | 100 | - |

Organochlorine Pesticides Screening in Soil

| | | | | | | |
|---------------------|--------------|---|---|---------|---------|---|
| Aldrin | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| alpha-BHC | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| beta-BHC | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| delta-BHC | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| gamma-BHC (Lindane) | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| cis-Chlordane | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| trans-Chlordane | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| 2,4'-DDD | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| 4,4'-DDD | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| 2,4'-DDE | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| 4,4'-DDE | mg/kg dry wt | - | - | 0.050 | 0.090 | - |
| 2,4'-DDT | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| 4,4'-DDT | mg/kg dry wt | - | - | 0.046 | 0.092 | - |
| Total DDT Isomers | mg/kg dry wt | - | - | 0.10 | 0.19 | - |
| Dieldrin | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Endosulfan I | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Endosulfan II | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Endosulfan sulphate | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Endrin | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Endrin aldehyde | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Endrin ketone | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Heptachlor | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Heptachlor epoxide | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Hexachlorobenzene | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |
| Methoxychlor | mg/kg dry wt | - | - | < 0.016 | < 0.015 | - |



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

| Sample Type: Soil | | | | | | |
|---|---------------------|----------------------------|----------------------------|--|--|--|
| | Sample Name: | SH24-10_100 13-Oct-2021 | SH24-11_100 13-Oct-2021 | SH24-12_100 13-Oct-2021 | SH24-13_100 13-Oct-2021 | SH24-15_100 13-Oct-2021 |
| | Lab Number: | 2735407.25 | 2735407.27 | 2735407.28 | 2735407.29 | 2735407.32 |
| Individual Tests | | | | | | |
| Dry Matter | g/100g as rcvd | - | - | - | 85 | - |
| Total Recoverable Lead | mg/kg dry wt | 17.9 | 6.0 | 7.2 | - | 50 |
| Heavy Metals, Screen Level | | | | | | |
| Total Recoverable Arsenic | mg/kg dry wt | - | - | - | 3 | - |
| Total Recoverable Cadmium | mg/kg dry wt | - | - | - | < 0.10 | - |
| Total Recoverable Chromium | mg/kg dry wt | - | - | - | 6 | - |
| Total Recoverable Copper | mg/kg dry wt | - | - | - | 5 | - |
| Total Recoverable Lead | mg/kg dry wt | - | - | - | 3.1 | - |
| Total Recoverable Nickel | mg/kg dry wt | - | - | - | < 2 | - |
| Total Recoverable Zinc | mg/kg dry wt | - | - | - | 112 | - |
| Organochlorine Pesticides Screening in Soil | | | | | | |
| Aldrin | mg/kg dry wt | - | - | - | < 0.012 | - |
| alpha-BHC | mg/kg dry wt | - | - | - | < 0.012 | - |
| beta-BHC | mg/kg dry wt | - | - | - | < 0.012 | - |
| delta-BHC | mg/kg dry wt | - | - | - | < 0.012 | - |
| gamma-BHC (Lindane) | mg/kg dry wt | - | - | - | < 0.012 | - |
| cis-Chlordane | mg/kg dry wt | - | - | - | < 0.012 | - |
| trans-Chlordane | mg/kg dry wt | - | - | - | < 0.012 | - |
| 2,4'-DDD | mg/kg dry wt | - | - | - | < 0.012 | - |
| 4,4'-DDD | mg/kg dry wt | - | - | - | < 0.012 | - |
| 2,4'-DDE | mg/kg dry wt | - | - | - | < 0.012 | - |
| 4,4'-DDE | mg/kg dry wt | - | - | - | < 0.012 | - |
| 2,4'-DDT | mg/kg dry wt | - | - | - | < 0.012 | - |
| 4,4'-DDT | mg/kg dry wt | - | - | - | < 0.012 | - |
| Total DDT Isomers | mg/kg dry wt | - | - | - | < 0.07 | - |
| Dieldrin | mg/kg dry wt | - | - | - | < 0.012 | - |
| Endosulfan I | mg/kg dry wt | - | - | - | < 0.012 | - |
| Endosulfan II | mg/kg dry wt | - | - | - | < 0.012 | - |
| Endosulfan sulphate | mg/kg dry wt | - | - | - | < 0.012 | - |
| Endrin | mg/kg dry wt | - | - | - | < 0.012 | - |
| Endrin aldehyde | mg/kg dry wt | - | - | - | < 0.012 | - |
| Endrin ketone | mg/kg dry wt | - | - | - | < 0.012 | - |
| Heptachlor | mg/kg dry wt | - | - | - | < 0.012 | - |
| Heptachlor epoxide | mg/kg dry wt | - | - | - | < 0.012 | - |
| Hexachlorobenzene | mg/kg dry wt | - | - | - | < 0.012 | - |
| Methoxychlor | mg/kg dry wt | - | - | - | < 0.012 | - |
| | Sample Name: | SH24-17_100 13-Oct-2021 | SH24-18_100 13-Oct-2021 | Composite of SH24-03a, SH24-03b, SH24-03 and cSH24-03d | Composite of SH24-04a, SH24-04b, SH24-04 and cSH24-04d | Composite of SH24-05a, SH24-05b, SH24-05 and cSH24-05d |
| | Lab Number: | 2735407.36 | 2735407.38 | 2735407.40 | 2735407.41 | 2735407.42 |
| Individual Tests | | | | | | |
| Dry Matter | g/100g as rcvd | 78 | 84 | 78 | 83 | 71 |
| Heavy Metals, Screen Level | | | | | | |
| Total Recoverable Arsenic | mg/kg dry wt | 6 | 4 | 5 | 5 | 5 |
| Total Recoverable Cadmium | mg/kg dry wt | 0.26 | 0.19 | < 0.10 | < 0.10 | < 0.10 |
| Total Recoverable Chromium | mg/kg dry wt | 6 | 5 | 7 | 6 | 5 |
| Total Recoverable Copper | mg/kg dry wt | 17 | 11 | 10 | 9 | 8 |
| Total Recoverable Lead | mg/kg dry wt | 11.0 | 6.5 | 5.7 | 16.2 | 9.8 |
| Total Recoverable Nickel | mg/kg dry wt | 3 | 2 | 3 | 5 | 3 |
| Total Recoverable Zinc | mg/kg dry wt | 49 | 39 | 43 | 35 | 30 |
| Organochlorine Pesticides Screening in Soil | | | | | | |
| Aldrin | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| alpha-BHC | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |

| Sample Type: Soil | | | | | | |
|---|----------------------------|----------------------------|--|--|--|---------|
| Sample Name: | SH24-17_100 13-Oct-2021 | SH24-18_100 13-Oct-2021 | Composite of SH24-03a, SH24-03b, SH24-03 and cSH24-03d | Composite of SH24-04a, SH24-04b, SH24-04 and cSH24-04d | Composite of SH24-05a, SH24-05b, SH24-05 and cSH24-05d | |
| Lab Number: | 2735407.36 | 2735407.38 | 2735407.40 | 2735407.41 | 2735407.42 | |
| Organochlorine Pesticides Screening in Soil | | | | | | |
| beta-BHC | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| delta-BHC | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| gamma-BHC (Lindane) | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| cis-Chlordane | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| trans-Chlordane | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| 2,4'-DDD | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| 4,4'-DDD | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| 2,4'-DDE | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| 4,4'-DDE | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| 2,4'-DDT | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| 4,4'-DDT | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Total DDT Isomers | mg/kg dry wt | < 0.08 | < 0.07 | - | - | - |
| Dieldrin | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Endosulfan I | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Endosulfan II | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Endosulfan sulphate | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Endrin | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Endrin aldehyde | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Endrin ketone | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Heptachlor | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Heptachlor epoxide | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Hexachlorobenzene | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Methoxychlor | mg/kg dry wt | < 0.013 | < 0.012 | - | - | - |
| Polycyclic Aromatic Hydrocarbons Screening in Soil* | | | | | | |
| Total of Reported PAHs in Soil | mg/kg dry wt | - | - | 0.5 | < 0.3 | < 0.4 |
| 1-Methylnaphthalene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| 2-Methylnaphthalene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| Acenaphthylene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| Acenaphthene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| Anthracene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| Benzo[a]anthracene | mg/kg dry wt | - | - | 0.015 | < 0.012 | < 0.014 |
| Benzo[a]pyrene (BAP) | mg/kg dry wt | - | - | 0.059 | < 0.012 | < 0.014 |
| Benzo[a]pyrene Potency Equivalency Factor (PEF) NES* | mg/kg dry wt | - | - | 0.09 | < 0.03 | < 0.04 |
| Benzo[a]pyrene Toxic Equivalence (TEF)* | mg/kg dry wt | - | - | 0.09 | < 0.03 | < 0.04 |
| Benzo[b]fluoranthene + Benzo[j] fluoranthene | mg/kg dry wt | - | - | 0.051 | < 0.012 | < 0.014 |
| Benzo[e]pyrene | mg/kg dry wt | - | - | 0.041 | < 0.012 | < 0.014 |
| Benzo[g,h,i]perylene | mg/kg dry wt | - | - | 0.074 | < 0.012 | < 0.014 |
| Benzo[k]fluoranthene | mg/kg dry wt | - | - | 0.021 | < 0.012 | < 0.014 |
| Chrysene | mg/kg dry wt | - | - | 0.019 | < 0.012 | < 0.014 |
| Dibenzo[a,h]anthracene | mg/kg dry wt | - | - | 0.014 | < 0.012 | < 0.014 |
| Fluoranthene | mg/kg dry wt | - | - | 0.030 | < 0.012 | < 0.014 |
| Fluorene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| Indeno(1,2,3-c,d)pyrene | mg/kg dry wt | - | - | 0.047 | < 0.012 | < 0.014 |
| Naphthalene | mg/kg dry wt | - | - | < 0.07 | < 0.06 | < 0.07 |
| Perylene | mg/kg dry wt | - | - | 0.019 | < 0.012 | < 0.014 |
| Phenanthrene | mg/kg dry wt | - | - | < 0.013 | < 0.012 | < 0.014 |
| Pyrene | mg/kg dry wt | - | - | 0.037 | < 0.012 | < 0.014 |

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

| Sample Type: Soil | | | |
|--|--|---------------------------|--|
| Test | Method Description | Default Detection Limit | Sample No |
| Environmental Solids Sample Drying* | Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%. | - | 1, 3, 17, 19, 21, 25, 27-29, 32, 36, 38, 40-42 |
| Environmental Solids Sample Preparation | Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation May contain a residual moisture content of 2-5%. | - | 1, 3, 21, 25, 27-28, 32 |
| Total of Reported PAHs in Soil | Sonication extraction, GC-MS analysis. In-house based on US EPA 8270. | 0.03 mg/kg dry wt | 40-42 |
| Heavy Metals, Screen Level | Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required. | 0.10 - 4 mg/kg dry wt | 17, 19, 29, 36, 38, 40-42 |
| Organochlorine Pesticides Screening in Soil | Sonication extraction, GC-ECD analysis. Tested on as received sample. In-house based on US EPA 8081. | 0.010 - 0.06 mg/kg dry wt | 17, 19, 29, 36, 38 |
| Polycyclic Aromatic Hydrocarbons Screening in Soil* | Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270. | 0.002 - 0.05 mg/kg dry wt | 40-42 |
| Dry Matter (Env) | Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550. | 0.10 g/100g as rcvd | 17, 19, 29, 36, 38, 40-42 |
| Total Recoverable digestion | Nitric / hydrochloric acid digestion. US EPA 200.2. | - | 1, 3, 21, 25, 27-28, 32 |
| Total Recoverable Arsenic | Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2. | 2 mg/kg dry wt | 1, 3 |
| Total Recoverable Lead | Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2. | 0.4 mg/kg dry wt | 21, 25, 27-28, 32 |
| Benzo[a]pyrene Potency Equivalency Factor (PEF) NES* | BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment. | 0.002 mg/kg dry wt | 40-42 |
| Benzo[a]pyrene Toxic Equivalence (TEF)* | Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo(a)anthracene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997). | 0.002 mg/kg dry wt | 40-42 |

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 18-Oct-2021 and 20-Oct-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental



Certificate of Analysis

Page 1 of 2

| | | | | |
|-----------------|--|--------------------------|------------------------|-------|
| Client: | 4Sight Consulting Limited | Lab No: | 2736757 | A2Pv1 |
| Contact: | Jarrold Hall C/- 4Sight Consulting Limited DX BOX HP40007 Tauranga 3112 | Date Received: | 15-Oct-2021 | |
| | | Date Reported: | 18-Oct-2021 | |
| | | Quote No: | 97403 | |
| | | Order No: | 9062 | |
| | | Client Reference: | SH24 Matamata | |
| | | Add. Client Ref: | Date sampled: 13/10/21 | |
| | | Submitted By: | Jarrold Hall | |

Sample Type: Building Material

| Sample Name | Lab Number | Sample Category* | Sample Weight on receipt (g) | Asbestos Presence / Absence | Description of Asbestos in Non Homogeneous Samples |
|-------------|------------|------------------|------------------------------|---|--|
| Bulk-01 | 2736757.1 | Fibre Cement | 13.77 | Asbestos NOT detected. Organic fibres detected. | N/A |
| Bulk-02 | 2736757.2 | Fibre Cement | 16.33 | Chrysotile (White Asbestos) detected. Organic fibres detected. | N/A |

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
 - Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
 - ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
 - ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
 - Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
 - Trace - Trace levels of asbestos, as defined by AS4964-2004.
- For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Building Material

| Test | Method Description | Default Detection Limit | Sample No |
|---|--|-------------------------|-----------|
| Asbestos in Bulk Material | | | |
| Sample Category* | Assessment of sample type. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington. | - | 1-2 |
| Sample Weight on receipt | Sample weight. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington. | 0.01 g | 1-2 |
| Asbestos Presence / Absence | Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 204 Thorndon Quay, Wellington. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples. | 0.01% | 1-2 |
| Description of Asbestos in Non Homogenous Samples | Form, dimensions and/or weight of asbestos fibres present. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples. | - | 1-2 |



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These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 18-Oct-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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A handwritten signature in blue ink, appearing to read 'Danielle Carter', with a horizontal line underneath.

Danielle Carter BSc, PGDipSci, MSc
Laboratory Technician - Asbestos



Certificate of Analysis

Page 1 of 3

| | | | | |
|-----------------|--|--------------------------|---------------|-------|
| Client: | 4Sight Consulting Limited | Lab No: | 2736759 | A2Pv1 |
| Contact: | Jarrold Hall C/- 4Sight Consulting Limited DX BOX HP40007 Tauranga 3112 | Date Received: | 15-Oct-2021 | |
| | | Date Reported: | 20-Oct-2021 | |
| | | Quote No: | 97403 | |
| | | Order No: | 9062 | |
| | | Client Reference: | SH24 Matamata | |
| | | Submitted By: | Jarrold Hall | |

Sample Type: Soil

| Sample Name: | SH24-03 13-Oct-2021 | SH24-06_100 13-Oct-2021 | SH24-08_100 13-Oct-2021 | SH24-10_100 13-Oct-2021 | SH24-11_100 13-Oct-2021 |
|--|------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Lab Number: | 2736759.1 | 2736759.4 | 2736759.8 | 2736759.12 | 2736759.14 |
| Asbestos Presence / Absence | Asbestos NOT detected. | Asbestos NOT detected. | Asbestos NOT detected. | Asbestos NOT detected. | Asbestos NOT detected. |
| Description of Asbestos Form | - | - | - | - | - |
| Asbestos in ACM as % of Total Sample* | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 |
| Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample* | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 |
| Asbestos as Fibrous Asbestos as % of Total Sample* | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 |
| Asbestos as Asbestos Fines as % of Total Sample* | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 | % w/w < 0.001 |
| As Received Weight | g 592.3 | g 603.7 | g 630.5 | g 666.8 | g 952.1 |
| Dry Weight | g 477.1 | g 385.0 | g 534.9 | g 552.8 | g 871.6 |
| Moisture | % 19 | % 36 | % 15 | % 17 | % 8 |
| Sample Fraction >10mm | g dry wt 67.5 | g dry wt < 0.1 | g dry wt < 0.1 | g dry wt 6.8 | g dry wt 267.0 |
| Sample Fraction <10mm to >2mm | g dry wt 135.1 | g dry wt 16.9 | g dry wt 74.8 | g dry wt 55.8 | g dry wt 230.6 |
| Sample Fraction <2mm | g dry wt 274.0 | g dry wt 367.0 | g dry wt 459.9 | g dry wt 489.7 | g dry wt 372.8 |
| <2mm Subsample Weight | g dry wt 50.1 | g dry wt 58.4 | g dry wt 57.4 | g dry wt 51.7 | g dry wt 55.8 |
| Weight of Asbestos in ACM (Non-Friable) | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 |
| Weight of Asbestos as Fibrous Asbestos (Friable) | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 |
| Weight of Asbestos as Asbestos Fines (Friable)* | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 | g dry wt < 0.00001 |

| Sample Name: | SH24-12_100 13-Oct-2021 | SH24-15_100 13-Oct-2021 | SH24-17_100 13-Oct-2021 | SH24-18_100 13-Oct-2021 | |
|--|----------------------------|----------------------------|----------------------------|----------------------------|---|
| Lab Number: | 2736759.15 | 2736759.16 | 2736759.20 | 2736759.22 | |
| Asbestos Presence / Absence | Asbestos NOT detected. | Asbestos NOT detected. | Asbestos NOT detected. | Asbestos NOT detected. | - |
| Description of Asbestos Form | - | - | - | - | - |
| Asbestos in ACM as % of Total Sample* | % w/w < 0.001 | - |
| Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample* | % w/w < 0.001 | - |
| Asbestos as Fibrous Asbestos as % of Total Sample* | % w/w < 0.001 | - |
| Asbestos as Asbestos Fines as % of Total Sample* | % w/w < 0.001 | - |
| As Received Weight | g 853.0 | g 466.8 | g 633.4 | g 730.4 | - |
| Dry Weight | g 813.6 | g 315.6 | g 492.6 | g 604.1 | - |
| Moisture | % 5 | % 32 | % 22 | % 17 | - |



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| Sample Type: Soil | | | | | | |
|--|----------------------------|----------------------------|----------------------------|----------------------------|-----------|---|
| Sample Name: | SH24-12_100 13-Oct-2021 | SH24-15_100 13-Oct-2021 | SH24-17_100 13-Oct-2021 | SH24-18_100 13-Oct-2021 | | |
| Lab Number: | 2736759.15 | 2736759.16 | 2736759.20 | 2736759.22 | | |
| Sample Fraction >10mm | g dry wt | 153.1 | < 0.1 | 55.8 | 14.5 | - |
| Sample Fraction <10mm to >2mm | g dry wt | 271.5 | 27.4 | 86.9 | 98.4 | - |
| Sample Fraction <2mm | g dry wt | 387.6 | 287.1 | 349.0 | 490.4 | - |
| <2mm Subsample Weight | g dry wt | 53.9 | 55.0 | 56.0 | 58.9 | - |
| Weight of Asbestos in ACM (Non-Friable) | g dry wt | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | - |
| Weight of Asbestos as Fibrous Asbestos (Friable) | g dry wt | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | - |
| Weight of Asbestos as Asbestos Fines (Friable)* | g dry wt | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | - |

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Please refer to the **BRANZ New Zealand Guidelines for Assessing and Managing Asbestos in Soil.**
<https://www.branz.co.nz/asbestos>

The following assumptions have been made:

1. Asbestos Fines in the <2mm fraction, after homogenisation, is evenly distributed throughout the fraction
2. The weight of asbestos in the sample is unaffected by the ashing process.

Results are representative of the sample provided to Hill Laboratories only.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

| Sample Type: Soil | | | |
|---|---|-------------------------|----------------------------|
| Test | Method Description | Default Detection Limit | Sample No |
| Individual Tests | | | |
| Wgt of Asbestos as Asbestos Fines in <10mm >2mm Fraction* | Measurement on analytical balance, from the <10mm >2mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. | 0.00001 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| New Zealand Guidelines Semi Quantitative Asbestos in Soil | | | |
| As Received Weight | Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. | 0.1 g | 1, 4, 8, 12, 14-16, 20, 22 |
| Dry Weight | Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. | 0.1 g | 1, 4, 8, 12, 14-16, 20, 22 |
| Moisture | Sample dried at 100 to 105°C. Calculation = (As received weight - Dry weight) / as received weight x 100. | 1 % | 1, 4, 8, 12, 14-16, 20, 22 |
| Sample Fraction >10mm | Sample dried at 100 to 105°C, 10mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. | 0.1 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| Sample Fraction <10mm to >2mm | Sample dried at 100 to 105°C, 10mm and 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. | 0.1 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| Sample Fraction <2mm | Sample dried at 100 to 105°C, 2mm sieve, measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. | 0.1 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| Asbestos Presence / Absence | Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples. | 0.01% | 1, 4, 8, 12, 14-16, 20, 22 |

| Sample Type: Soil | | | |
|--|--|-------------------------|----------------------------------|
| Test | Method Description | Default Detection Limit | Sample No |
| Description of Asbestos Form | Description of asbestos form and/or shape if present. | - | 1, 4, 8, 12, 14-16, 20, 22 |
| Weight of Asbestos in ACM (Non-Friable) | Measurement on analytical balance, from the >10mm Fraction. Weight of asbestos based on assessment of ACM form. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.00001 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| Asbestos in ACM as % of Total Sample* | Calculated from weight of asbestos in ACM and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.001 % w/w | 1, 4, 8, 12, 14-16, 20, 22 |
| Weight of Asbestos as Fibrous Asbestos (Friable) | Measurement on analytical balance, from the >10mm Fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.00001 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| Asbestos as Fibrous Asbestos as % of Total Sample* | Calculated from weight of fibrous asbestos and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.001 % w/w | 1, 4, 8, 12, 14-16, 20, 22 |
| Weight of Asbestos as Asbestos Fines (Friable)* | Measurement on analytical balance, from the <10mm Fractions. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.00001 g dry wt | 1, 4, 8, 12, 14-16, 20, 22 |
| Asbestos as Asbestos Fines as % of Total Sample* | Calculated from weight of asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.001 % w/w | 1, 4, 8, 12, 14-16, 20, 22 |
| Combined Fibrous Asbestos + Asbestos Fines as % of Total Sample* | Calculated from weight of fibrous asbestos plus asbestos fines and sample dry weight. New Zealand Guidelines for Assessing and Managing Asbestos in Soil, November 2017. | 0.001 % w/w | 1, 4, 8, 12, 14-16, 20, 22 |

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed on 20-Oct-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

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Rhodri Williams BSc (Hons)
Technical Manager - Asbestos

