



## **Appendix C**

### **Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI) Reports**



**Soil Contamination Risk  
Preliminary and Detailed Site Investigation Report  
and Remediation Action Plan**

**1/487 & 2/487 Weedons Road,  
Rolleston**

September 2024



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## QUALITY CONTROL AND CERTIFICATION SHEET

**Client:** Your Section

**Date of Issue:** 19 September 2024

**Report written by:**

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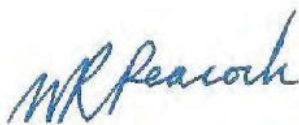
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## 1 Executive Summary

The subject site comprises two rural residential lots located at 1/487 and 2/487 Weedons Road, Rolleston, Canterbury. It is proposed to rezone the site to allow residential development. This will enable future change in use, subdivision and potential disturbance of soils. Therefore, an assessment under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESC) is required. It is also noted that Momentum Environmental Ltd (MEL) is obligated to consider the requirements of Section 10 (4) of the Health and Safety at Work (Asbestos) Regulations 2016. This report details the work undertaken to assess the risks.

The Preliminary Site Investigation (PSI) portion of this investigation identified two confirmed or likely Hazardous Activities and Industries List (HAIL) activities on the subject site and determined there may be a risk to human health from contaminated soils. It was recommended that a Detailed Site Investigation be undertaken on the identified risk areas. The identified confirmed or likely HAIL activities were:

- Potential use of persistent pesticides on a historical apple orchard, current walnut orchard, an area of other horticultural activities and within a potentially unused commercial greenhouse (HAIL A10).
- Potential heavy metal contamination within potential former and current burn areas (HAIL I).

Soil sampling was undertaken on the 03 and 04 September 2024. The soil sampling identified seven current or former burn areas contaminated with arsenic above 'residential 10% produce' SGVs. The arsenic exceedances range from 22mg/kg to 1,120mg/kg compared with the 'residential 10% produce' SGV of 20mg/kg. One burn area also exceeds the 'residential 10% produce' SGV for lead with a result of 250mg/kg compared with the 'residential 10% produce' SGV of 210mg/kg. Given the mode of contamination this is likely limited to the top 100-150mm of soils. The contaminated areas have not been delineated.

It is recommended that the identified contaminated areas be remediated prior to the change of use or development of each area. It is also recommended that further investigation of the potential burn areas on 2/487 Weedons Road that could not be XRF tested or sampled during this investigation be undertaken when rural residential use of this property ceases. Of the untested/unsampled potential burn areas, BP3 is considered the most likely to be contaminated as the waste pile contained items of non-green waste and it has been present for at least 4 years. Delineation of the identified contaminated areas could occur at the same time to better inform remediation volumes. Equally, delineation could occur during the remediation process with the use of a portable XRF.

The current proposed remediation methodology is excavation and disposal off-site to an approved disposal facility. Following remediation, a Site Validation Report is required to be produced and provided to Selwyn District Council and ECan.

The remainder of the subject site is considered suitable for residential use with no further investigations required.

At the time of writing this report, resource consent for subdivision and change of use is required under the NESC as a 'restricted discretionary' activity due to the presence of soil contamination above the applicable standards in Regulation 7. The current estimated remediation volumes are below permitted thresholds, therefore, the soil disturbance associated with remediation of the two contaminated areas can be carried out as a permitted activity.

## 2 Objectives of the Investigation

This report has been prepared in general accordance with the Ministry for the Environment's (MfE) "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand, revised 2021" (CLMG) and the New Zealand Guidelines for Assessing and Managing Asbestos in Soils, November 2017 (NZ GAMAS). This report includes all requirements for a Preliminary and Detailed Site Investigation Report and a Remediation Action Plan.

The objective of this investigation is to:

- Collect and assess information from multiple sources to understand past and current land uses.
- Describe the physical and environmental features of the site to understand potential pathways and receptors.
- Establish whether an activity or industry described in the Hazardous Activities and Industries List (HAIL) is being, has been, or is more likely than not to have been undertaken on the site.
- Assess whether there is any risk to potential receptors that would warrant further investigation.
- Collect and analyse site information, including soil sampling and testing, to determine the extent and type of any contamination present.
- Provide remediation or site management recommendations to the client based on the results of the investigation.

## 3 Scope of Work Undertaken

The scope of the work undertaken has included:

- Obtaining and review of Environment Canterbury (ECan) data from the Listed Land Use Register (LLUR).
- Search of Land Information New Zealand (LINZ) orchard database.
- Review of relevant historical aerial photographs.
- Review of relevant historical certificates of title (CTs).
- Review of Selwyn District Council (SDC) property files.
- Designing a sampling and analysis plan based on the identified contaminant risks.
- On site soil sampling and laboratory testing.
- Analysis of results against applicable soil guidelines values (SGVs).
- Preparation of this report in accordance with MfE guidelines.



## 4 Site Identification

The subject site is located at 1/487 and 2/487 Weedons Road, Rolleston, Canterbury as shown on the plan in **Figure 1** below. The subject site is legally described as Lot 2 and Lot 3 DP 47839 and has a total area of approximately 8.6614ha.

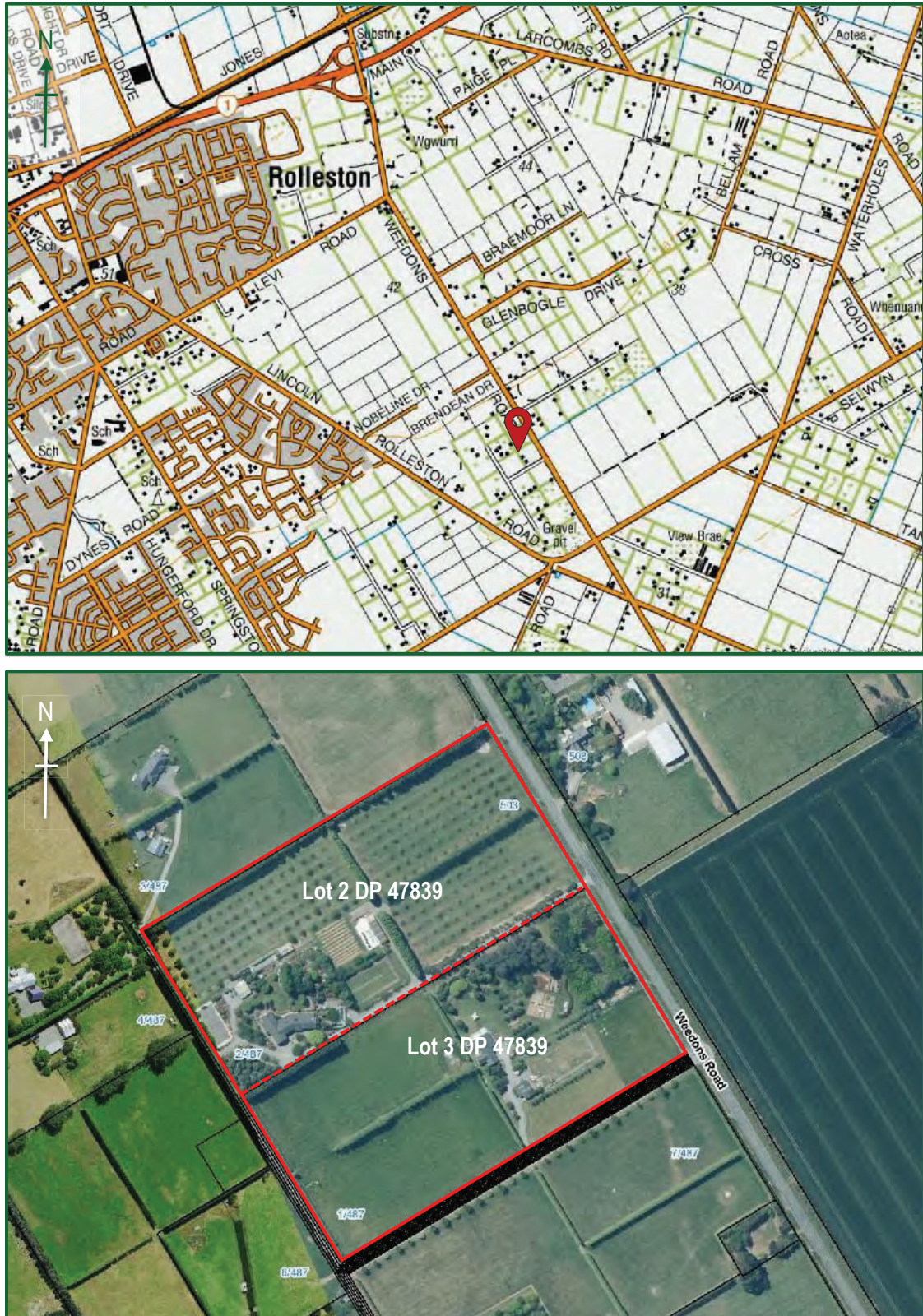


Figure 1 – Location Plan

## 5 Proposed Site Use

It is proposed to rezone the site to allow residential development. This will enable future change in use, subdivision and potential disturbance of soils.

## 6 Site Description

### 6.1 Environmental Setting

**Table 1 – Environmental Information**

<b>Topography</b>	The subject site is generally flat land.
<b>Geology</b>	The ECan GIS database describes the soils at the subject site as Templeton deep silt. Nearby and onsite bore logs indicate that topsoils are underlain by layers of silty gravel, sandy gravel and gravel.
<b>Soil Trace Elements</b>	According to the ECan GIS database, natural concentrations of trace elements for the site are those of the 'Regional, Recent' soil group.
<b>Groundwater</b>	The subject site lies over the unconfined and semiconfined gravel aquifer system. Groundwater levels recorded onsite bore logs are between 10.9m and 12.54m deep. The direction of groundwater flow is generally in a south-easterly direction.
<b>Surface Water</b>	A water race runs along the opposite side of Weedons Road.

### 6.2 Site Layout and Current Site Uses

Both properties have a rural residential use.

1/487 Weedons Road contains a dwelling within an established garden on the northern quarter of the property. A large shed/workshop and two smaller animal shelters/chicken coops are present on the eastern quarter of the property. The remainder of the property is pastoral farmland.

2/487 Weedons Road contains a dwelling within an established garden on the southern quarter of the property. The curtilage area includes a garage/sleepout, another ancillary building, tennis court, swimming pool and a greenhouse. The majority of the rest of the property is a walnut orchard with one small area planted with blueberry bushes. A farm shed is present within the horticultural part of the property.

### 6.3 Surrounding Land Uses

The surrounding land is similar rural residential land.

### 6.4 Geotechnical Investigations

At the time of writing no geotechnical investigations were made available to Momentum Environmental Ltd (MEL).

## 7 Historical Site Use

### 7.1 Previous Site Ownership and Use

Historical Certificates of Title (CTs) were reviewed with the following relevant ownership information outlined below. No occupations of concern were identified.

03 August 1897	George Troll, farmer
26 May 1903	William McMeekan, farmer
27 March 1907	Ellen Page, spinster



06 July 1909	Walter Wright, farmer
01 July 1922	William Henry Peter Sowden, farmer
19 June 1933	Duncan Gillanders, farmer
22 November 1945	Ian Thomas Reid, farmer
11 February 1977	Ian Thomas Reid, farmer, John walker Allan, farmer and The Trustees Executors and Agency Company of New Zealand
11 September 1984	Northern Spy Orchards Ltd, Target Orchard Ltd, Green Leaf Orchard Ltd, City Side Orchard Ltd, Ellesmere Orchard Ltd, Paparua Orchard Ltd, Export Apples Ltd, Orchard Ride Ltd, Long Acre Orchard Ltd, Big Pick Orchard Ltd and Red Apple Orchard Ltd

#### **1/487 Weedons Road**

22 October 1985	City Side Orchard Ltd
09 July 1999	Northwest Farm Ltd
23 April 2002	Dean James Aitken, Edith Lorraine Aitken and William Gavin Hayes
13 February 2006	Edith Lorraine Aitken and Lindsay James Officer
11 March 2008	Edith Lorraine Aitken and Bevin Ian Godfrey
24 April 2015	Aaron Michael Kenny and Sarah Lee Meehan
24 April 2024	Your Section Ltd

#### **2/487 Weedons Road**

22 October 1985	Green Leaf Orchard Ltd
09 July 1999	Northwest Farm Ltd
05 April 2000	Lindsay James Officer and Laura Elizabeth Revill
07 May 2021	Aidan Robert Boniface and Joanne Margaret Boniface

Note that some of the older information was of poor quality and difficult to follow, therefore the accuracy of the spelling of names and dates is not guaranteed. Copies of the historical CTs are included in **Appendix A**.

## **7.2 District Authority Records**

The subject site is currently zoned Inner Plains in the operative Selwyn District Plan. It is zoned General Rural Zone in the proposed Selwyn District Plan.

#### **1/487 Weedons Road**

Property files were provided by Selwyn District Council (SDC) on 27 August 2024. The files included the following permits and consents:

- A building consent issued on 31 July 2002 to relocate a commercial glasshouse onto the subject site. with a boiler house.
- A building consent issued on 22 November 2002 to erect a dwelling and garage.
- A building consent issued on 23 December 2002 to erect a boiler house to heat the commercial glasshouse. The boiler was to be fuelled from a coal bunker via an automated auger. However, the building consent was later amended and the boiler house was changed to be a workshop and shed only. The records indicate that the boiler was removed to facilitate this amendment, however, it is unclear whether the boiler was ever used as it indicates the 'proposed commercial hydroponics greenhouse venture is now not a viable option' which suggests the horticultural activities had not yet commenced.

**BC 020952 - BOILER HOUSE - AMENDMENTS****Proposal:**

Due to a change in family circumstances the proposed commercial hydroponics greenhouse venture is now not a viable option and a decision on what is to be done with the greenhouse is still to be made. However, it is intended that the existing boiler house constructed under Building Consent 020952 (issued in 2002) will be converted into a workshop/store and the attached coal bunker into a garden shed. To this end it is intended that the following work be carried out as an amendment to the existing building consent:

**Figure 2 – Snip from property file**

- Building consent issued on 12 December 2006 for dwelling alterations (conversion of garage to bedroom).
- Building consent issued on 23 October 2013 for dwelling alterations (fire damage reinstatement).
- Building consent issued on 13 June 2016 for dwelling alterations.
- Building consent issued on 22 December 2023 to install a solid fuel heater.

**2/487 Weedons Road**

Property files were provided by Selwyn District Council (SDC) on 04 September 2024. The files included the following permits and consents:

- Building consent issued on 10 November 2000 to erect a hay shed.
- Building consent issued on 02 February 2001 to erect a dwelling.
- Building consent issued on 23 June 2004 for alterations to a farm building to add a workroom, car port, ablution facilities and a solid fuel heater.
- Building consent issued on 09 September 2004 to erect an implement shed.
- Building consent issued on 19 January 2009 to construct a swimming pool.

**7.3 Regional Council Records**

The subject site is listed on the Listed Land Use Register (LLUR) as part of a larger site for activities and industries as per the 'Hazardous Activities and Industries List' (HAIL). Site 118904, which includes the subject site, is listed for HAIL activity 'A10 – Persistent pesticide bulk storage or use'. An orchard was developed around 1984, with 1994 aerial photographs used to define the extent of planting. The listed site is categorised as 'Verified HAIL has not been investigated'.

One nearby site is also listed:

- 6/487 Weedons Road is listed as 'Site 235788', also for HAIL activity 'A10 – Persistent pesticide bulk storage or use'. This was part of the same orchard as Site 118904. However, this part of the orchard is listed as 'Yet to be reviewed' as investigations have been undertaken but not yet reviewed by ECan. Part of this site was investigated by Pattle Delamore Partners Ltd (PDP) in June 2019. This site was also investigated by MEL in March 2024. The investigations found no heavy metal or organochlorine pesticide (OCP) contamination that would pose a risk to human health or the environment from the former orchard use. A burn area contaminated with heavy metals above 'residential 10% produce' SGVs was identified and broadly delineated. The identified contaminated area is approximately 75m south-west of the subject site. This listed site is considered highly unlikely to pose a risk of migration of contaminants to the subject site.

The ECan GIS database shows two active bores on the subject site, used for domestic and stockwater supply. The nearest active well is M36/1914 used for irrigation, located approximately 10m south-west of the subject site.

The ECan GIS database shows an active resource consent for the subject site to discharge pool backwash water to land. Within a 100m radius of the subject site there are active resource consents to discharge domestic sewage tank effluent into ground, and to take and use groundwater.

#### 7.4 LINZ Records

The LINZ Orchard layer shows there is a listed orchard on part of 2/487 Weedons Road. There are other nearby orchards as shown in blue on the plan below.



Figure 3 – LINZ Plan

#### 7.5 Review of Historical Aerial Photographs

A total of eleven historical aerial photographs have been sourced from ECan GIS database to assess the historical use of the subject site. Copies of the aerial photographs used are included in **Appendix C**.

- The earliest available aerial photograph is from **1942** and shows the subject site is in pasture. The surrounding area is similar pastoral farmland.
- The next available aerial photograph is from **1961**. There are no significant changes to the subject site. A dwelling has been constructed approximately 145m south-east of the subject site.
- The **1974** aerial photograph shows no significant changes to the subject site. Horticultural activities appear to be occurring beyond the subject site to the north-east. A dwelling is also now present beyond the subject site to the north-east.
- The **1982** aerial photograph shows no significant changes to the subject site or surrounding area.



- The **1994** aerial photograph shows an orchard has been planted on the subject site and the surrounding land on the south-west side of Weedons Road. Sheds, most likely the orchard yard area, are now present beyond the subject site to the south-west. The horticultural activities to the north-east appear to have ceased.
- The **2000** aerial photograph shows the orchard has been removed from one quarter of 2/487 Weedons Road. There are three potential burn areas visible on this paddock. The orchard has also been removed from the land to the south-west of the subject site. This area has been developed for rural residential use.
- The **2005** aerial photograph shows most of the orchard has been removed from the north-east half of 1/487 Weedons Road. Two structures are now present on 1/487 Weedons Road, one is the dwelling and the other the boiler house/workshop described in the property file. A garden is being established around the dwelling. A bare area of soils is present in the expected location of the glasshouse suggesting the glasshouse has been removed or is not yet fully built. A new area of trees appears to have been planted on the northern corner of 1/487 Weedons Road. A dwelling, sheds and garden have been established on the southern quarter of 2/487 Weedons Road. Trees are still present on the remaining paddocks of 2/487 Weedons Road. However, these are more spaced out than the previous aerials suggesting either some trees have been removed or the orchard has been replanted. Land to the north-west and south-east has also been developed for rural residential use.
- The **2012** aerial photograph shows possible burn areas at the north-east end of the former glasshouse location on 1/487 Weedons Road. Another possible burn area is visible on the northern corner of 2/487 Weedons Road and on the northern corner of the western paddock on this property. More of the orchard has been removed from the surrounding land.
- The **2016** aerial photograph shows the orchard has been removed from the south-west half of 1/487 Weedons Road. Nine potential burn areas are visible within these two cleared paddocks.
- The latest aerial photograph is dated **2020**. It shows a possible burn area is present to the south-west of the dwelling on 1/487 Weedons Road. An area of possible soil disturbance is present near the north-east boundary of 1/487 Weedons Road. Horticultural activities appear have ceased on part of 2/487 Weedons Road to the north-east of the dwelling. Another possible burn area is present on the western corner of the northern paddock of 2/487 Weedons Rd. There are no significant changes to the surrounding land.

## 8 Site Inspection

A site inspection was conducted on 03 September 2024 to identify any other potential sources of contamination not identified by the desktop portion of this investigation.

### 1/487 Weedons Road

The dwelling is a modern timber clad structure with a metal roof set within an established garden that includes raised vegetable beds and a domestic greenhouse. At the rear of the dwelling was a circle of bare soils with some ash, shown as BP13 on the Sample Location Plan in **Appendix D**. No other potential sources of contamination were identified around the dwelling or residential curtilage area.



Photo 1 – Dwelling on 1/487 Weedons Rd



Photo 2 – Domestic greenhouse



Photo 3 – Raised vege beds



Photo 4 – Potential burn area BP13

To the south-east of the dwelling is a workshop/shed with a lean-to woodshed on its south-west side and a lean-to hay shed on its south-east end. The workshop/shed has a concrete floor and is understood to be the former boiler house that was likely never used as a boiler house. A concrete coal bunker remains within the lean-to hay shed. No evidence that coal storage has occurred was observed.



Photo 5 – workshop/shed with lean-to woodshed



Photo 6 – Lean-to hay shed with concrete block coal bunker at back

The former greenhouse area is now a grassed paddock. A burn area (BP14) is present within this paddock. Charred metal and timber items are present within a raised pile of ash.





**Photo 7 – Former greenhouse area**



**Photo 8 – Burn area BP14**

The area of possible soil disturbance noted on the latest aerial near the north-east boundary of the property was observed to be a firewood processing area. This use is considered highly unlikely to pose a risk of contamination and no sampling of this area was considered necessary.



**Photo 9 – Firewood processing area**

### **2/487 Weedons Road**

The residential curtilage area includes a modern dwelling, garage/sleepout, greenhouse and another ancillary building. A tennis court and swimming pool are also present. Inside the greenhouse, plants are being grown in a raised bed or pots inside the greenhouse. This was considered highly unlikely to pose a risk of contamination of the soils. An area of organic matter and ash was present at the end of the greenhouse, it was unclear whether this was a compost heap or a burn area (BP6). An ivy-covered mound of soils is present at the end of the tennis court. XRF testing of this mound detected no heavy metals above expected background levels. It is considered most likely that this soil was sourced from the property, from excavations during the development of the property for rural residential use.





Photo 10 – Dwelling on 2/487 Weedons Rd



Photo 11 – Garage/sleepout



Photo 12 – Ancillary building



Photo 13 – Raised bed inside greenhouse



Photo 14 – Compost heap/burn area BP6



Photo 15 – Ivy covered mound

Beyond the residential curtilage area is a farm building. Most of the floor is concrete, the bay without a concrete floor is being used as a woodshed. The area around the building is mainly gravel and appears to be being used for sorting walnuts and processing firewood. The majority of the property is planted with a walnut orchard. A number of piles of tree trimmings are present within the orchard area, three of these align with potential burn areas observed on the aerial photographs (BP2, BP3 and BP4). The majority of the waste piles contained only green waste so the likelihood of contamination of the underlying soils is considered to be low. Only BP3 contained non-green waste items including possible treated timber. As this burn area has been present since at least 2020 it is considered likely that the underlying soils are contaminated. Storage of items relating to an events business is occurring on the



northern quarter of 2/487 Weedons Road. The items include marquee parts (scaffolding, canvas, flooring), seats, and decorations. The items are considered unlikely to pose a risk of contamination of the underlying soils.



Photo 16 – Farm building



Photo 17 – Walnut sorting equipment and firewood



Photo 18 – Walnut orchard



Photo 19 – Green waste pile (BP1)



Photo 20 – Waste pile including non-green waste (BP3)



Photo 21 – Storage of event business equipment

An area of possible horticultural activities was observed on the aerial photographs at the rear of the farm building. Part of this area is currently planted with blueberries. The rest is now grassed and no horticultural activities are occurring.





Photo 22 – Blueberry area



Photo 23 – Grassed former horticultural area

Following the site inspection, the current owner of 2/487 Weedons Road was queried about the sprays used on the walnut orchard and blueberry area. Aidan Boniface advised that they have used small quantities of Glufosinate-ammonium around the blueberries to keep weeds down, no sprays have been used on the walnut trees. No other sprays have been used since they took ownership in 2021.

## 9 Preliminary Risk Assessment

### 9.1 Potential HAIL Uses

The Hazardous Activities and Industries List (HAIL) compiled by The Ministry for the Environment include the following categories (*in italics*) that could be associated with the historical uses of the site with a summary of the risk of these activities having been carried out on the site.

#### A – Chemical manufacture, application and bulk storage

*10. Persistent pesticide bulk storage or use, including sport turfs, market gardens, orchards, glasshouses or spray sheds*

The owners of the subject site between 1984 and 1999 were apple orchard companies. Aerial photographs show the subject site was planted as orchard from at least 1994. The apple orchard was progressively removed from the subject site from the early 2000's onwards. Persistent pesticides may have been used on the subject site during this time. Given the era of the apple orchard, the use of organochlorine pesticides (OCPs) is considered highly unlikely, however, has been included as a contaminant of concern out of an abundance of caution. Contaminants of concern include heavy metals and organochlorine pesticides (OCPs).

A commercial greenhouse was likely relocated onto 1/487 Weedons Road in 2002. However, it does not appear that it was ever used and it has since been removed from the property. If the greenhouse was operational, sprays including heavy metals and organonitrogen and organophosphorus pesticides (ONOPs) may have been used. Given the time since these potential activities, it is considered highly unlikely that any significant ONOP contamination remains.

A walnut orchard was planted on 2/487 Weedons Road between 2000 and 2005. Intensive use of sprays on nut orchards is not common practice and the current owner (since 2021) has indicated they have not used any sprays on the walnuts. However, the use of sprays prior to 2021 cannot be ruled out. Contaminants of concern include heavy metals.

Part of 2/487 Weedons Road appears to have had a horticultural use different from the surrounding walnut orchard from 2005 onwards. At the time of the site inspection, blueberries were planted on one half of this area and the other half was grassed. The current owner has indicated small amounts of Glufosinate-ammonium have been used around the blueberries to keep the weeds down. Glufosinate-ammonium has a soil half-life of 8-23 days and is not considered to be persistent. Potentially organonitrogen and organophosphorus pesticides (ONOPs) may have been used on this area prior to 2021 but given the time passed it is considered highly unlikely that any significant ONOP contamination remains.

**H - Any land that has been subject to the migration of hazardous substances from adjacent land in sufficient quantity that it could be a risk to human health or the environment**

The orchard previously present on the subject site also extended onto adjacent land. Possible horticultural activities beyond the subject site to the north-east were observed on aerials from 1974 until 1994. It is considered highly unlikely that migration of contaminants to the subject site from other parts of the orchard area or the horticultural activities to the north-east would be distinguishable from any contamination on the subject site from its own horticultural uses.

**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**

There is no evidence of any buildings or structures being present on the subject site prior to 2000. No evidence of asbestos containing building materials (ACM) in a deteriorated state was observed during the site inspection. It is considered highly unlikely that soil contamination from lead-based paint products or asbestos containing materials exists on the subject site in sufficient quantities that would pose a risk to human health.

Multiple possible burn areas were observed on aerial photographs from 2000 onwards and during the site inspection. The majority of these burn areas were likely associated with clearing areas of former orchard. As such the material burnt was most likely green waste. However, the burning of non-green waste cannot be ruled out which could have caused contamination of the underlying soils. Contaminants of concern include heavy metals.

An ivy-covered mound of soils is present at the end of the tennis court on 2/487 Weedons Road. XRF testing of this mound detected no heavy metals above expected background levels. This mound of soil is not considered to be a potential source of soil contamination. HAIL I is not considered to apply to this mound of soil.

## **9.2 Preliminary NESCS Assessment**

In relation to the NESCS, Regulation 5(7) states that land is considered to be covered if an activity or industry described in the HAIL is being undertaken; has been undertaken; or is more likely than not to have been undertaken on it. Regulation 6 describes the methods for determining this. Method 6(3) is to rely on a Preliminary Site Investigation. The 'NESCS Users Guide' indicates the test for 'more likely than not' is whether there is more than a 50 percent likelihood of the HAIL having occurred.

The table below states the likelihood of each HAIL identified in **Section 9.1** above:

**Table 2 – Preliminary NESCS Assessment**

<b>HAIL Category</b>	<b>6(3)a - Is being undertaken</b>	<b>6(3)b – has been undertaken</b>	<b>6(3)c – likelihood of having been undertaken (if not confirmed)</b>
A10 – Persistent pesticide bulk storage or use	-	-	More likely than not
H – migration of contaminants	-	-	Highly unlikely
I – Any other land (lead paint & asbestos from buildings)	-	-	Highly unlikely
I – Any other land (burn areas)	Yes	-	More likely than not

### 9.3 Preliminary Conceptual Site Model

The following preliminary conceptual site model (CSM) indicates potentially complete exposure pathways associated with the identified risks at the site. The locations of the risk areas are shown on **Figure 3** below.

**Table 3 – Preliminary Conceptual Site Model**

<b>Conceptual Site Model</b>				
<b>Source</b>	<b>Pathways</b>		<b>Receptor</b>	<b>Exposure Pathway Status</b>
<ul style="list-style-type: none"> <li>Potential use of persistent pesticides on historical apple orchard, current walnut orchard, area of other horticultural activities and within a commercial greenhouse.</li> <li>Potential heavy metal contamination within possible former burn areas and current burn areas.</li> </ul>	<b>Human</b>	Dermal contact, ingestion and inhalation through soil contact	Current and future site occupiers and workers involved in soil disturbance activities.	Potentially complete
		Infiltration through soils to groundwater	Groundwater is assumed to be 10.9-12.54m deep at the site	Likely incomplete due to separation distance.
	<b>Ecological</b>	Surface runoff to waterways	Water race on opposite side of Weedons Road	Likely incomplete

Based on the NESCS assessment and the preliminary CSM above, the NESCS does apply to the site. It is recommended that a Detailed Site Investigation, in terms of the Ministry for the Environment's Contaminated Land Management Guidelines, be undertaken on the identified risk areas prior to development. These areas are shown on the Risk Area Plan below. Due to their small sizes, the approximate locations of the potential/known burn areas are simply marked with a yellow cross.





Figure 4 – Risk Area Plan (yellow 'X' for potential former and current burn areas)

## 10 Sampling and Analysis Plan

### 10.1 Sampling Design

The proposed use for the subject site is residential. For the purpose of designing a sampling plan the subject site has been considered as one exposure area with overlapping risk areas. The specifics of the sample design strategy are included in **Table 4** below.

**Table 4 – Sampling Design Strategy**

<b>Contaminants of concern</b>	<b>Apple orchard risk area</b> – Heavy metals, OCPs <b>Walnut orchard risk area</b> – Heavy metals <b>Other horticultural risk area</b> – Heavy metals <b>Greenhouse risk area</b> – Heavy metals, ONOPs <b>Burn areas</b> – Heavy metals.
<b>Media to be sampled</b>	Soils

<b>Number of sample locations</b>	<p><b>Apple orchard/walnut orchard/other horticultural/greenhouse risk areas –</b> Contamination linked to horticultural uses is likely to be diffuse. Therefore, systematic or grid sampling of these areas is considered appropriate.</p> <p>During use as an apple orchard the subject site was divided into 8 paddocks by shelterbelts. Three of the 8 apple orchard paddocks had the trees removed in the early 2000s. Due to the short duration of the orchard activities and the time passed since the orchard was present, these areas are considered to be at a lower risk of significant contamination. Two sample locations per paddock is considered appropriate to assess the contamination from the former orchard on these three former paddocks. However, there are overlapping risk areas which also require assessment. Therefore, these three former paddocks will be sampled as follows:</p> <ul style="list-style-type: none"> <li>• Lower risk orchard paddock 1 – southern corner of 2/487 Weedons Road which includes the more recent 'other horticultural risk area'. One sample location to be placed within the residential curtilage area representing the former apple orchard use only. To also assess the 'other horticultural risk area', one sample location will be centrally placed within the blueberry growing area and one sample location to be centrally placed within the adjacent other former horticultural area.</li> <li>• Lower risk orchard paddock 2 – northern corner of 1/487 Weedons Road has no other potential sources of contamination. Two sample locations evenly distributed across this former paddock area.</li> <li>• Lower risk orchard paddock 3 – eastern corner of 1/487 Weedons Road includes the possible commercial greenhouse area. Two sample locations to be evenly distributed across this paddock ensuring that one location lies within the greenhouse area.</li> </ul> <p>The remaining 5 orchard paddocks continued to have an orchard use until more recently (either remaining planted with apple trees until the 2010s or planted with walnuts in the early 2000s to the present day). This increases the risk of a more significant build up of persistent pesticides. Four sample locations per paddock will be evenly distributed across these 5 paddocks.</p> <p><b>Burn Areas –</b> A judgemental sampling strategy will be used with one sample location per burn area, sample locations to be guided by XRF screening. If the potential burn area aligns with a grid sample location described above, then the soils will be sampled as described for the grid sample location.</p>
<b>Depth of samples</b>	<p><b>Apple orchard/walnut orchard/other horticultural/greenhouse risk areas –</b> Given the likely source of contamination and proposed use for the subject site, surface and near surface (250mm) samples are considered appropriate. Deeper samples may also be taken at other sample locations if buried contamination is suspected based on observations during sampling.</p> <p><b>Burn Areas –</b> given the mode of contamination, surface samples are considered appropriate.</p>
<b>Testing Methodology</b>	<p><b>Apple orchard/walnut orchard/other horticultural/greenhouse risk areas –</b> All surface samples will be analysed for seven heavy metals. All surface samples will be analysed for OCPs as seven laboratory composite samples. The three surface samples from the 'other horticultural' and greenhouse risk areas</p>

	<p>will be analysed for ONOPs as one laboratory composite sample. Analysis of the deeper samples and/or individual samples will occur if the initial results indicate possible contaminant concentrations of concern.</p> <p><b>Burn Areas</b> – soil samples from locations where XRF screening identifies heavy metal concentrations of concern will be analysed for seven heavy metals to confirm the XRF readings. Where the XRF readings indicate no elevated heavy metals are present the soil samples will be held cold. Samples from former potential burn areas not XRF tested as they aligned with grid sample locations will be analysed as per the horticultural risk areas described above.</p>
<b>Field Sampling Technique</b>	Samples to be taken by hand using a stainless-steel spade, trowel or fresh disposable nitrile gloves.
<b>XRF Testing Procedure</b>	3-4 XRF tests will be performed across each burn area. A soil sample will be taken at the location with the highest XRF readings in each burn area.

## 10.2 Soil Guideline Values

Human health soil contaminant standards for a group of 12 priority contaminants were derived under a set of five land-use scenarios and are legally binding under The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NESCS). These standards have been applied where applicable. The regulations describe these as Soil Contaminant Standards. For contaminants other than the 12 priority contaminants, the hierarchy as set out in the Ministry for the Environment Contaminated Land Management Guidelines No 2 has been followed. These are generally described as Soil Guideline Values. For simplicity, this report uses the terminology Soil Guideline Values (SGV) when referring to the appropriate soil contaminant standard or other derived value from the hierarchy. For soil, guideline values are predominantly risk based, in that they are typically derived using designated exposure scenarios that relate to different land uses. For each exposure scenario, selected pathways of exposure are used to derive guideline values. These pathways typically include soil ingestion, inhalation and dermal adsorption. The guideline values for the appropriate land use scenario relate to the most critical pathway.

The land-use scenario applicable for the site is 'residential 10% produce'. The 'commercial/industrial outdoor worker' land use scenario has been applied as a proxy for workers involved in disturbing soils activities.

The adopted trigger values used to determine need for assessment of ecological receptors (including stormwater disposal areas) also referred to as Ecological Guideline Values (EGVs) are the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (online) – Sediment GV-high (ANZWQ) multiplied by 3.

For comparison of site concentrations against expected background levels the following published concentrations will be used:

- Heavy metal concentrations will be assessed against the expected background levels as published in *Background Concentrations in Canterbury soils*, Tonkin and Taylor, July 2007.
- Organochlorine pesticide concentrations will be assessed against the concentrations published in *Ambient Concentrations of Selected Organochlorine in Soils*, Buckland, Ellis and Salter, 1998.

### 10.3 Quality Assurance and Quality Control

Field quality assurance measures as described in Section 4.3.1 of the “Contaminated Land Management Guidelines No 5: Site Investigation and Analysis of Soils, revised 2021” (CLMG) are to be followed. These include using trained staff, choosing appropriate sample containers, accurate and individual labelling and recording of locations, completing appropriate laboratory chain of custody forms, chilling of samples as appropriate and timely delivery to laboratories. All non-disposable sampling equipment should be decontaminated between samples using Decon 90 and rinsed with tap water. All samples are to be submitted to IANZ accredited laboratories. Quality control to ensure freedom from sample cross-contamination is to be measured by the appropriate use of duplicate and rinsate blank samples.

### 10.4 XRF Quality Assurance Measures

The current NZ XRF use guidelines (Ministry for the Environment. 2024. *Field use of X-ray fluorescence spectroscopy for investigation of contaminated soils*. Wellington) are to guide the use of the XRF for this investigation.

The XRF to be used is an Olympus Vanta M-Series with a 50KV tube. The manufacturer’s instructions are to be followed in the use of the device. All users are to be trained and licensed to operate the XRF.

Standard reference materials and a blank are to be tested prior to each day’s testing and compared with expected results. Blank readings are to be taken throughout the day’s testing as appropriate to ensure there is no contamination of the XRF window.

It is intended that the device be used qualitatively at this site to guide sample collection and analysis.

## 11 Sampling Results

### 11.1 Summary of Works/Field Observations

Soil sampling was undertaken on 03 and 04 September 2024 in general accordance with the proposed sampling plan. A Sample Location Plan showing the sampled locations is included in **Appendix D**. Grid sample locations are labelled ‘SS’ and burn areas are labelled ‘BP’. A Table of XRF Results from the XRF screening is included in **Appendix E**.

Twenty-seven grid sample locations were sampled at surface and 250mm depth. The sampled soils were generally dark brown silts.

#### **Potential burn areas on 2/487 Weedons Road**

Three potential burn areas were noted on the southern paddock of 2/487 Weedons Road on the 2000 aerial. One of these is now under the dwelling. It is likely that if any contamination of this area had occurred the contamination would have been removed during construction of the dwelling. Any remaining contamination is capped and does not pose a risk to human health. This location was not sampled. The second potential former burn area aligns with grid sample location SS9, this location was not XRF tested but was sampled at the surface and 250mm depth in accordance with the sampling plan for the grid samples. The third potential former burn area was XRF tested and sampled as BP5. The XRF readings indicated arsenic concentrations may exceed ‘residential 10% produce’ SGVs in this location. Therefore, soil sample BP5.1 was submitted for heavy metal analysis.

Eight waste piles/possible burn areas are currently present within the walnut orchard area. Of these current waste piles/burn areas four were XRF tested and sampled as BP1, BP2, BP4 and BP6. The



others could not be XRF tested or sampled as the underlying soils could not be accessed through the waste piles.

BP1 (current waste pile) and BP2 (observed on the 2012 aerial and has a current waste pile) were only seen to contain green waste with no evidence of burning. The XRF readings were all around expected background levels. Therefore, no HAIL activity is considered to have occurred at BP1 or BP2.

BP3 (current waste pile and observed on 2020 aerial) was not XRF tested or sampled as the underlying soils could not be accessed. Some items of non-green waste were observed in this waste pile. It is not clear whether burning has occurred at this location but as a waste pile/burn area has been present in this location for at least 4 years it is considered highly likely that some contamination of the underlying soils has occurred.

BP4 (current waste pile and observed on aerial photographs from 2012 onwards) currently contains only green waste. The underlying soils were seen to include ash indicating that burning has occurred in this location. The XRF screening identified arsenic contamination exceeding the 'residential 10% produce' SGV. Sample BP4.1 was submitted for heavy metal analysis to confirm the XRF readings.

BP6 was a compost area with ashy soils located at the end of the greenhouse. XRF testing of the soils indicated possible elevated arsenic concentrations. Sample BP6.1 was submitted for heavy metal analysis to confirm the XRF readings.

The remaining three current waste piles could not be XRF tested or sampled as the underlying soils could not be accessed through the waste piles. The waste piles only contained green waste most likely from tree pruning. These are shown without labels on the Sample Location Plan.

#### **Potential burn areas on 1/487 Weedons Road**

Multiple former potential burn areas were identified on 1/487 Weedons Road during the aerial photograph review. Grid sample locations SS22, SS26, SS25 and SS27 were aligned with four of these former potential burn areas. No ash or other evidence of burning was observed at these locations during sampling. These locations were sampled at surface and 250mm depth without XRF testing as per the sampling plan for the grid samples. Once the results of the surface samples from SS25 and SS27 showed exceedances of the 'residential 10% produce' SGVs for arsenic, the 250mm depth samples were also submitted for heavy metal analysis.

Six more former potential burn areas were XRF tested and sampled at the surface as BP7-BP10, BP11 and BP12. No ash or other evidence of burning was observed at these locations. The XRF readings were all around expected background levels around BP7, BP8, BP9, BP10 and BP11. Therefore, no HAIL activity is considered to have occurred at BP7, BP8, BP9, BP10 and BP11. The XRF screening identified arsenic contamination exceeding the 'residential 10% produce' SGV at BP12. Sample BP12.1 was submitted for heavy metal analysis to confirm the XRF readings.

Ashy soils were observed at former potential burn area BP15 confirming that this was previously a burn area. The XRF screening identified arsenic contamination exceeding the 'residential 10% produce' SGV. Sample BP15.1 was submitted for heavy metal analysis to confirm the XRF readings.

A circle of bare soils with some ash was observed adjacent to the dwelling during the site inspection. This was XRF tested and sampled as BP13. The XRF readings were all around expected background levels within this circle of bare soils. Therefore, no HAIL activity is considered to have occurred at BP13.

A current burn area including non-green waste items was observed within the greenhouse area during the site inspection. This was XRF tested and sampled as BP14. The XRF screening identified high arsenic concentrations, exceeding the 'residential 10% produce' SGV. Sample BP14.1 was submitted for heavy metal analysis to confirm the XRF readings.

### Laboratory Analysis Summary

A total of 35 surface samples including two duplicates were analysed for seven heavy metals. Two 250mm depth samples were analysed for seven heavy metals once the surface samples showed heavy metal contamination was present. Twenty-seven surface samples were analysed for OCPs as seven laboratory composite samples. Three surface samples were analysed for ONOPs as one laboratory composite sample.

## 11.2 Evaluation of Results

The laboratory results show seven current or former burn areas exceed the 'residential 10% produce' soil guideline value (SGV) for arsenic. BP14 also exceeds the 'residential 10% produce' SGV for lead for one or more heavy metals, as shown in **Table 5** below:

**Table 5 – Samples exceeding residential 10% produce SGV ('-' = no exceedance)**

Sample	Depth (mm)	Arsenic (mg/kg)	Lead (mg/kg)
SS25	50	25	-
SS27	50	24	-
BP4.1	0-50	360	-
BP5.1	0-50	22	-
BP12.1	0-50	28	-
BP14.1	0-50	1,120	250
BP15.1	0-50	880	-
<b>'Residential 10% Produce' SGV</b>		<b>20</b>	<b>210</b>

The contamination is likely limited to the top 100-150mm of soils. This is verified by the arsenic results from SS25 and SS27 at 250mm depth which were below expected background levels.

The arsenic concentrations in samples BP4.1, BP14.1 and BP15.1 also exceed the 'commercial/industrial outdoor worker' SGV of 70mg/kg and the ecological guideline value (EGV) of 210mg/kg.

Away from the contaminated burn areas, background concentrations for one or more metals were exceeded in approximately two-thirds of the locations.

Traces of 4,4'-DDD (a breakdown product of DDT) were detected all of the seven composite samples analysed for OCPs. Traces of 4,4'-DDT was detected in two composite samples. The Total DDT concentrations were below the laboratory limit of detection for all seven composite samples analysed for OCPs.

Traces of Terbutylazine were detected in the composite samples analysed for ONOPs. There are no soil guideline values for this compound. The result of 0.04mg/kg is considered highly unlikely to pose a risk to human health or the environment. All other ONOP analytes were below the laboratory limit of detection.

A Table of Laboratory Results is included in **Appendix F** and copies of the Laboratory Reports are included in **Appendix G**.

### 11.3 Results of Field & Laboratory Quality Assurance and Quality Control

The Relative Percentage Differences (RPD) for the duplicate sample pairs (SS7.1/DUP1 and SS18.1 / DUP2) were 0-11%, which is within acceptable ranges indicating no quality-control issues.

All laboratory tested samples were submitted to Hill Laboratories for analysis. Hill Laboratories holds IANZ accreditation. As part of holding accreditation the laboratory follows appropriate testing and quality control procedures. No quality control issues were identified.

### 11.4 Results of XRF Quality Assurance and Quality Control

The quality assurance measures prescribed above were followed. Calibration checks and blank testing showed no quality control issues.

## 12 Quantified Risk Assessment

Soil sampling has identified seven current or former burn areas contaminated with arsenic above 'residential 10% produce' SGVs. One burn area also exceeds the 'residential 10% produce' SGV for lead.

The following conceptual site model assesses the risk posed by the identified contaminants:

**Table 5 – Revised conceptual site model**

Conceptual Site Model				
Source	Pathways		Receptor	Risk Assessment
Arsenic contaminated burn areas with arsenic concentrations ranging from 22-1,120mg/kg. One burn area is also contaminated with lead.	Human	Dermal contact, ingestion and inhalation	Future site occupiers / land users.	Moderate to high risk to human health in an uncontrolled residential use as results exceed the 'residential 10% produce' SGV.
			Workers involved in soil disturbance at the site.	Moderate risk to human health as some results exceed the commercial / outdoor worker SGV for arsenic. It is likely this risk can be managed by the implementation of an appropriate Site Management Plan.
	Ecological	Infiltration through soils to groundwater	Groundwater is assumed to be 10.9-12.54m deep at the site	Low risk – contamination likely limited to top 100-150mm of soils.
		Surface runoff to waterways	Water race on opposite side of Weedons Road	Low risk due to the separation distances between the water race and any results exceeding EGVs.

It is recommended that the identified contaminated burn areas be remediated prior to development of the subject site for residential use. It is also recommended that further investigation of the potential burn areas that could not be tested/sampled on 2/487 Weedons Road be undertaken when rural residential use of this property ceases. Of the untested/unsampled potential burn areas, BP3 is considered the most likely to be contaminated as the waste pile contained items of non-green waste and it has been

present for at least 4 years. Delineation of the identified contaminated areas could occur at the same time to better inform remediation volumes. Equally, delineation could occur during remediation with the use of a portable XRF.

Although not posing a risk to human health or the environment, the client may consider also remediating burn area BP6 to ease future off-site disposal and consenting needs for new lot owners.

## **13 Scope and Purpose of Remediation**

### **13.1 Remediation Objectives**

The remediation objectives for the site are to remove any pathways between the contaminants and the receptors of significance. Based on the results for the site, the significant receptors are humans. There are multiple ways to achieve this objective, including, but not limited to, removal of the contaminated material, capping to create a barrier between the contaminated material and the receptor, or by implementing ongoing site management measures to reduce the risk.

Other ancillary objectives include:

- To ensure that appropriate site management measures are in place to protect workers from exposure to contaminants contained in the soils.
- To ensure that soil management controls are in place to prevent tracking of contaminants, dust, stormwater runoff erosion.
- To ensure that any contaminated soils removed off-site are disposed of to an appropriate location.

### **13.2 Remedial Options**

While multiple options are available, in terms of practicality and consenting requirements, and due to the levels of contamination found, excavation and off-site disposal to an approved facility is the recommended methodology. The Remediation Action Plan included in this report has been written to support this method.

Alternative remediation options include capping the contaminated soils or relocating into a managed containment cell on other parts of the subject site, or a combination of measures. If alternative methodologies are to be pursued then an updated Remediation Action Plan will be required, along with consideration of environmental effects and consenting needs.

The following methodology and Site Management Plan should be followed for remediation by excavation of the contaminated soils and off-site disposal.

### **13.3 Proposed Standard of Remediation**

The standard of remediation is to ensure contaminated material with heavy metal concentrations above the 'residential 10% produce' SGVs have been removed from the subject site and disposed of at a facility authorised to receive the material.

It is noted that this standard of remediation does not intend to leave the site as 'clean' which is defined as having all contaminant levels below expected natural background levels. This may mean that off-site disposal of soils from future development works will not qualify for disposal to cleanfill facilities. If required, the client could choose to remediate to a higher standard.



### 13.4 Proposed Remediation Methodology

The proposed remediation methodology below is to be planned and carried out as a separate work programme prior to any bulk earthworks or other development related earthworks to avoid any risks of cross-contamination and delays to the main earthworks programme. Prior to beginning any earthworks, a site meeting between the contractor's on-site representative and Momentum Environmental Ltd (MEL) is to take place. This will also allow MEL staff to mark the appropriate areas, particularly as the contaminated areas have only been broadly delineated to date.

The remediation of the subject site is to occur as follows:

1. Set up all site controls and equipment as required and in accordance with the General Site Management Plan detailed below in **Section 14**.
2. Excavate the identified affected areas to approximately 100mm below ground level.
3. Carry out XRF testing to determine the extent of any remaining heavy metal contamination in the soil. Undertaking XRF testing in conjunction with the excavation works will help minimise the volumes requiring disposal while ensuring the remediation objectives are met.
4. Continue to excavate any remaining heavy metal contaminated soils in accordance with the objectives set out above.
5. Dispose of soils to a suitable disposal location, as per **Section 13.7**
6. Following excavation works, the excavated area including walls and base, should be tested by XRF to confirm whether the remediation goal has been achieved. When the XRF results indicate success, laboratory validation sampling should be undertaken.
7. If laboratory results indicate further heavy metal contamination is present, further excavations and validation sampling will be required.
8. Decontaminate all equipment prior to commencing other site earthworks.

### 13.5 Remediation Volumes

The following estimated volumes have been provided in good faith to assist in consenting and estimating the extent and cost of works required. The likely affected volumes are based on the current known or expected extent of contamination found and is not to be taken as the final or maximum likely volume. All remediation of contaminated soils has the risk of extending further out or deeper due to hidden areas of contamination.

The contaminated areas have not been delineated. The size of the affected areas has been estimated based on observations during sampling and previous extents shown by historical aerial photographs. The depth of contamination is likely limited to the top 100-150mm of soils based on experience with remediation of other contaminated burn areas.

**Table 6 – Estimated In-Situ Remediation Volumes**

Contaminated Area	Approx. Size of Area	Approx. In-situ Volume
Former burn area SS25	Size of area on aerial photographs is estimated to be 180m <sup>2</sup> .	18-27m <sup>3</sup>
Former burn area SS27	Size of area on aerial photographs is estimated to be 80m <sup>2</sup> .	0.8-1.2m <sup>3</sup>
Current burn area BP4	Current waste pile measures approximately 7x8m. However, aerial photographs indicate the affected area may measure 130m <sup>2</sup> .	13-20m <sup>3</sup>

Former burn area BP5	Size of area on aerial photographs is estimated to be 170m <sup>2</sup> .	17-26m <sup>3</sup>
Former burn area BP12	Size of area on aerial photographs is estimated to be 65m <sup>2</sup> .	7-10m <sup>3</sup>
Current burn area BP14	Size of area of ashy soils observed during sampling estimated to be 70m <sup>2</sup> .	7-11m <sup>3</sup>
Former burn area BP15	Size of area on aerial photographs is estimated to be 115m <sup>2</sup> .	11-17m <sup>3</sup>
<b>Approx. Total</b>		<b>74-112 m<sup>3</sup></b>

### 13.6 Regulatory Requirements

Soil sampling has shown contamination levels exceed the applicable standards in Regulation 7. Therefore, at the time of writing, the proposed change of use and subdivision will require resource consent from the Waimakariri District Council under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health Regulations (NESCS).

The remediation excavations will include the activities of soil disturbance and off-site disposal. The permitted volumes are compared with the estimated remediation volumes in **Table 7** below:

**Table 7 – Remediation Permitted Activity Assessment**

		<b>Indicative soil volume</b>	<b>Complies</b>
<b>Area of the 'piece of land'</b>	86,614m <sup>2</sup>		
<b>Permitted soil disturbance volume 25 cubic metres per 500m<sup>2</sup></b>	4,331m <sup>3</sup>	74-112 m <sup>3</sup>	Yes
<b>Permitted removal volume 5 cubic metres per 500m<sup>2</sup> per year</b>	866m <sup>3</sup>	74-112 m <sup>3</sup>	Yes

Based on the above, the soil disturbance associated with the remediation activities will comply and are classified as a 'permitted activity' under the NESCS.

It is recommended that a planner fully assess all proposed activities associated with the development and remediation against the Land and Water Regional Plan to determine whether consents from ECan are necessary due to the identification of contaminated land.

### 13.7 Disposal Location

The following table identifies the main disposal locations in Canterbury for the identified contaminants of concern at the time of writing this report.

**Table 8 – Potential Disposal Locations**

Landfill	Contaminant		Acceptability of site soils
	Arsenic	Lead	
Burwood Landfill	80mg/kg	880mg/kg	Former burn areas SS25, SS27, BP5, & BP12: soils do qualify. Former/current burn areas BP4, BP14 & BP15 – soils do not qualify due to the arsenic concentrations.
Hororata Managed Fill Site	140mg/kg	500mg/kg	Former burn areas SS25, SS27, BP5, & BP12: soils do qualify. Former/current burn areas BP4, BP14 & BP15 – soils do not qualify due to the arsenic concentrations.
Kate Valley (Class A landfill)	100mg/kg or 5g/m <sup>3</sup> by TCLP	100mg/kg or 5g/m <sup>3</sup> by TCLP	Soils may qualify for disposal at Kate Valley Landfill subject to TCLP analysis.
Canterbury EnviroSolutions (Temuka)	CESL has a soil holding and remediation pad for the testing and storage of contaminated material. They are able to blend, treat and retest contaminated soils prior to disposal at an appropriate landfill. Therefore, whether they can accept material is determined on a case-by-case basis. It is recommended that the results from this DSI are sent to CESL to determine whether they can accept the material and obtain a quote for disposal.		

### 13.8 Disposal Documentation

For any off-site disposal, all weighbridge/disposal dockets are to be retained and a copy provided to the suitably qualified and experienced practitioner (SQEP) to include in the final validation report and to show compliance with any resource consent conditions.

## 14 Site Management Plan

### 14.1 Site Setup

- Fencing should be installed to prevent unauthorised access to the work area if required.
- Contaminated areas should be clearly identified with site entry and exits planned before works commence.
- Appropriate washing/decontamination facilities should be put in place to clean any equipment exposed to contaminated soils.
- A large, consistent and reliable water supply and applicators for dust suppression should be available.
- Remediation should be planned in advance to ensure it occurs in a staged approach/ methodical manner to ensure that vehicles do not track contaminated soils onto cleaner areas.
- A complete copy of this Remediation Action Plan should be provided to all relevant parties, including the contractor, prior to any works commencing.

### 14.2 Personal Occupational Safety and Health Measures

The contractor shall prepare a site-specific Health and Safety Plan covering all relevant matters and all workers will be inducted prior to site works beginning. As a minimum, the following matters will need to be included:

- Appropriate personal protection gear which should include as a minimum, head to toe clothing, the use of gloves for any worker handling soil, dust masks to prevent ingestion of contaminated dust particles, safety footwear, hard hats and hi-vis vests.

- Appropriate hand washing measures to prevent ingestion of contaminated soil particles.
- Truck loading procedures and spill prevention.
- Decontamination measures for all equipment.

#### **14.3 Stormwater and Soil Management**

Remediation work should not take place during heavy rain or high wind. If rainfall occurs and tracking of wet contaminated soils off the site becomes a risk, work should cease.

In general, stockpiling should be kept to a minimum. Any contaminated soil that is to be stockpiled on the site should be appropriately stabilised to prevent mobilisation of contaminants through wind or rain as required. This may include covering, compacting, polymer or other measures appropriate to the soil type and conditions.

#### **14.4 Dust Control**

Water will be made available at the remediation site with operators available and will be used to keep the dust emissions to an acceptable level to protect human health as required.

All vehicles transporting soils off-site will use tarpaulins to prevent dust emissions if required.

#### **14.5 Unexpected Contamination Discovery Protocols**

During the excavation works, if any other hazardous material is encountered in significant volumes that pose a threat to the health of workers on site, all works should cease until the hazardous material has been assessed by a SQEP in accordance with MfE guidelines.

Signs that would indicate further assessment is required include visually discoloured soils, olfactory evidence of hydrocarbons or other potential contaminants, oily greasy soils, asbestos containing materials or significant rubbish items.

### **15 Site Validation Strategy**

Following remediation excavation works, the excavated areas including walls and base, shall be tested by XRF to confirm the extent of any remaining contamination or to confirm remediation has been successful. Laboratory sampling will be required to confirm the XRF readings. The number and location of validation samples is to be determined by an experienced contaminated land practitioner based on the final lateral and vertical extent of the remediated areas.

Where sampling reveals the goals have not been achieved, further remediation works shall be carried out either by further excavation or by capping the remaining soils as deemed most appropriate.

A Site Validation Report will be produced and provided to Selwyn District Council and ECan.

### **16 Conclusion**

This investigation identified a risk of soil contamination on the subject site from potential former burn areas, current burn areas, former use as an apple orchard and more recent horticultural activities including a possibly unused commercial greenhouse, a walnut orchard and blueberry growing.

Soil sampling was undertaken on the 03 and 04 September 2024. The soil sampling identified seven current or former burn areas contaminated with arsenic above 'residential 10% produce' SGVs. One burn area also exceeds the 'residential 10% produce' SGV for lead. Given the mode of contamination,

the contamination is likely limited to the top 100-150mm of soils. The contaminated areas have not been delineated.

It is recommended that the identified contaminated areas be remediated prior to the change of use or development of each area. It is also recommended that further investigation of the potential burn areas that could not be tested/sampled on 2/487 Weedons Road be undertaken when rural residential use of this property ceases. Of the untested/unsampled potential burn areas, BP3 is considered the most likely to be contaminated as the waste pile contained items of non-green waste and it has been present for at least 4 years. Delineation of the identified contaminated areas could occur at the same time to better inform remediation volumes. Equally, delineation could occur during remediation with the use of a portable XRF.

The current proposed remediation methodology is excavation and disposal off-site to an approved disposal facility. Following remediation, a Site Validation Report is required to be produced and provided to Selwyn District Council and ECan.

The remainder of the subject site is considered suitable for residential use with no further investigations required.

At the time of writing this report, resource consent for the proposed subdivision and change of use is required under the NESCS as a 'restricted discretionary' activity due to the presence of soil contamination above the applicable standards in Regulation 7.

## 17 Limitations

Momentum Environmental Limited has performed services for this project in accordance with current professional standards for environmental site assessments, and in terms of the client's financial and technical brief for the work. Any reliance on this report by other parties shall be at such party's own risk. It does not purport to completely describe all the site characteristics and properties. Where data is supplied by the client or any third party, it has been assumed that the information is correct, unless otherwise stated. Momentum Environmental Limited accepts no responsibility for errors or omissions in the information provided. Should further information become available regarding the conditions at the site, Momentum Environmental Limited reserves the right to review the report in the context of the additional information.

Opinions and judgments expressed in this report are based on an understanding and interpretation of regulatory standards at the time of writing and should not be construed as legal opinions. As regulatory standards are constantly changing, conclusions and recommendations considered to be acceptable at the time of writing, may in the future become subject to different regulatory standards which cause them to become unacceptable. This may require further assessment and/or remediation of the site to be suitable for the existing or proposed land use activities. There is no investigation that is thorough enough to preclude the presence of materials at the site that presently or in the future may be considered hazardous.

This report does not attempt to describe all risks or possible outcomes resulting from carrying out remediation works. Any party carrying out remediation works shall be responsible for all such works, including implementing all health and safety precautions as appropriate. Momentum Environmental Limited disclaims all liability whatsoever for any loss or damages, if any, suffered by any party as a result of any remediation works undertaken.

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## **Appendix A – Historical Certificates of Title**



Prior C/T 207/200

Transfer No.

N/C. Order No. 77158/1



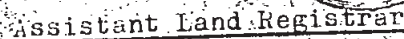
**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 26th day of April, one thousand nine hundred and seventy six  
under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that IAN THOMAS REID of pringston, Farmer

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 22.6624 of the Boston Survey.

hectares or thereabouts situated in Block IV of the Leeston Survey District, being Rural Section 4296 \_\_\_\_\_



Transfer 116057/1 to Ian Thomas Reid of Springston, Farmer, John Walker Allan of Dunsandel, Farmer and The Trustees Executors and Agency Company of New Zealand at Dunedin - 11.2.1977 at 9.39 a.m.

Mortgage 116057-2 to Alan Thomas  
Reid - 11.2.1972 at 9.39 a.m.

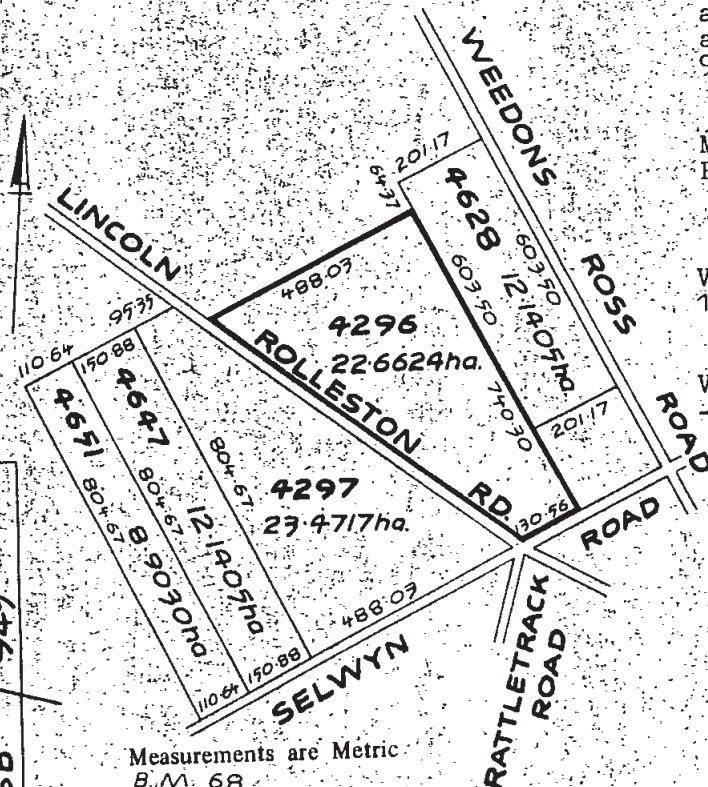
Variation of Mortgage 116057/2  
14.12.1977 at 9.33 am.

Variation of Mortgage 116057/2  
- 24.10.1978 at 10.36 am.

Variation of Mortgage 116057/2 -  
4.2.1980 at 9.53 am.

Mortgage 359857/1 to The Rural  
Banking and Finance Corporation -  
11-12-1981 at 9.40a.m.

for A.L.R.



Measurements are Metric  
B.M. 68



2 No. 359857/2 Memorandum of Priority  
Making Mortgages 34254/1 and 116057/2  
first and second Mortgages respectively -  
11-12-1981 at 9.40a.m.

O.C.T.512483/2)  
16.10.1984)

Cancelled and  
CsT.26F/951-953  
issued for Lots  
16-18 D.P.47504.

Variation of Mortgage 116057/2 - 29-5-1992 at  
9.08a.m.

*Wannan*  
for A.L.R.

Mortgage 384123/2 to the Bank of New South Wales -  
28-5-1982 at 9.09a.m.

*Wannan*  
for A.L.R.

Variation of Mortgage 359857/1 - 10.12.1982  
at 9.28 a.m.

*Wannan*  
for A.L.R.

Variation of Mortgage 359857/1 -  
15.9.1983 at 9.20 am.

*Wannan*  
for A.L.R.

CANCELLED  
DUPLICATE DESTROYED

*Yan*  
A.L.R.

PLAN No. 47504 LODGED 28/6/84

AND DEPOSITED  
Northern Spy Orchards Limited,  
Transfer 507081/4 to Target Orchard  
Limited, Green Leaf Orchard Limited,  
City Side Orchard Limited, Ellesmere  
Orchard Limited, Paparua Orchard  
Limited, Export Apples Limited,  
Orchard Ride Limited, Long Acre  
Orchard Limited, Big Pick Orchard  
Limited and Red Apple Orchard  
Limited all at Timaru as tenants  
in common in equal shares -  
11.9.1984 at 11.45 a.m.

*E. J. J. J.*

for A.L.R.

Mortgage 507081/5 to Raymond  
Sullivan Solicitors Nominee Company  
Limited - 11.9.1984 at 11.45 a.m.

*E. J. J. J.*

for A.L.R.

PLAN No. 47839 LODGED 3/10/1984  
AND DEPOSITED 16/10/1984

Pursuant to Section 306 (3) of the Local  
Government Act 1974 Lot 19 Plan 47504  
is vested in the Ellesmere County Council  
as Road

*[Signature]*  
A.L.R.

No.502775/1 Compliance Certificate  
pursuant to Section 306 (1)(f)(i)  
Local Government Act 1974 - 15.8.1984  
at 2.30pm.

*Yan*  
A.L.R.



CANCELLED

Land and Deeds 69

References

Prior C/T 207/200

Transfer No.

N/C. Order No. 77158/1



REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 26th day of April one thousand nine hundred and seventy six under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that IAN THOMAS REID of Springston, Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 12.1405

hectares or thereabouts situated in Block IV of the Leeston Survey District, being Rural Section 4628



Assistant Land Registrar

Transfer 116057/1 to Ian Thomas Reid, of Springston, Farmer, John Walker Allan of Dunsandel, Farmer and The Trustees Executors and Agency Company of New Zealand at Dunedin - 11.2.1977 at 9.39 a.m.

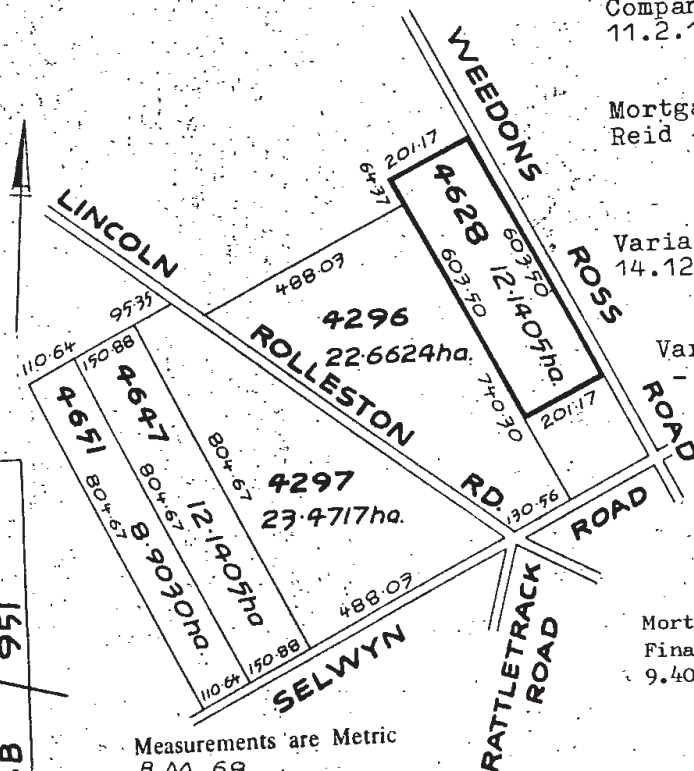
Mortgage 116057/2 - Ian Thomas Reid - 11.2.1977 at 9.39 a.m.

Variation of Mortgage 116057/2 - 14.12.1977 at 9.33 a.m.

Variation of Mortgage 116057/2 - 24.10.1978 at 10.36 a.m.

Variation of Mortgage 116057/2 - 4.2.1980 at 9.53 a.m.

Mortgage 359857/1 to The Rural Banking and Finance Corporation - 11.12.1981 at 9.40 a.m.



Measurements are Metric  
B.M. 68

OVER...

Register copy for L. & D. 69, 71, 72

No. 168 / 951

No. 168 / 951

No. 359857/2 Memorandum of Priority making  
 Mortgages ~~359857/1~~ and 116057/2 first and second  
 mortgages respectively - 11.12.1981 at 9.40 a.m.

Variation of Mortgage 116057/2 - 28-5-1982 at  
 9.08a.m.

Mortgage 384123/2 to The Bank of New South Wales -  
 28-5-1982 at 9.09a.m.

Variation of Mortgage 359857/1 - 10.12.1982  
 at 9.28 a.m.

Variation of Mortgage 359857/1 -  
 15.9.1983 at 10.20 am.

PLAN No. 47504 LODGED 28/6/84

AND DEPOSITED

Northern Spy Orchards Limited,  
 Transfer 507081/4 to Target Orchard  
 Limited, Green Leaf Orchard Limited,  
 City Side Orchard Limited, Ellesmere  
 Orchard Limited, Paparua Orchard  
 Limited, Export Apples Limited,  
 Orchard Ride Limited, Long Acre  
 Orchard Limited, Big Pick Orchard  
 Limited and Red Apple Orchard  
 Limited all at Timaru as tenants  
in common in equal shares -  
 11.9.1984 at 11.45 a.m.

Mortgage 507081/5 to Raymond  
 Sullivan Solicitors Nominee Company  
 Limited - 11.9.1984 at 11.45 a.m.

PLAN No. 47839 LODGED 3/10/1984  
 AND DEPOSITED 16/10/84

No. 502775/1 Compliance Certificate  
 pursuant to Section 306(1)(f)(i)  
 Local Government Act 1974 - 15.8.1984  
 at 2.30pm.

OCT 512483/2) Cancelled and  
 16.10.1984) CsT.26F/952 and 953  
 issued for Lots 17  
 and 18 D.P.47504.

CANCELLED  
 DUPLICATE DESTROYED



CANCELLED

Land and Deeds 69

No. 168  
954

References

Prior C/T 207/200

Transfer No.

N/C: Order No. 77158/1



REGISTER

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 26th day of April one thousand nine hundred and seventy six under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that IAN THOMAS REID of Springston, Farmer

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 25.8998

hectares or thereabouts situated in Block IV of the Leeston Survey District, being Rural Section 4702



Assistant Land Registrar

Transfer 116057/1 to Ian Thor Reid of Springston, Farmer John Walker Allan of Dunsandel, Farmer and The Trustees Executors and Agency Company of New Zealand at Dunedin - 11.2.1977 at 9.39 a.m.

Mortgage 116057/2 to Ian Thomas Reid - 11.2.1977 at 9.39 a.m.

Variation of Mortgage 116057/2 14.12.1977 at 9.33 am.

Variation of Mortgage 116057/2 24.10.1978 at 10.36 am.

Variation of Mortgage 116057/2 - 4.2.1980 at 9.53 am.

for A.L.R.

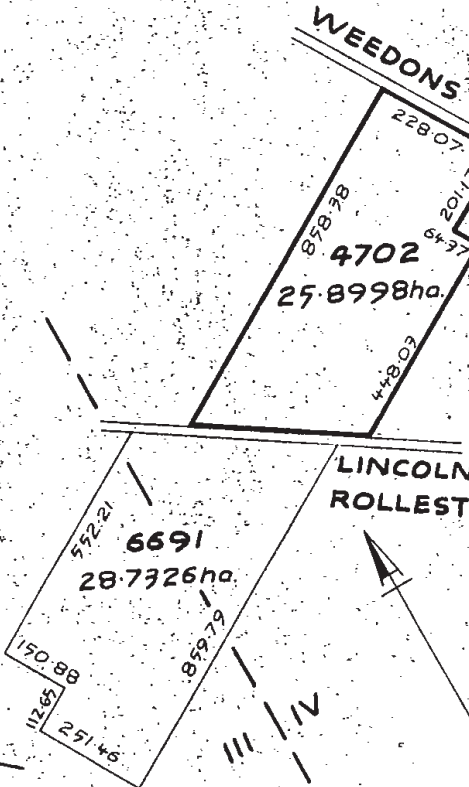
for A.L.R.

over...

Register copy for L. & D. 69, 71, 72

WEEDONS ROSS ROAD

LINCOLN - ROLLESTON ROAD



Measurements are Metric  
B.M. 68

No. 168  
954

Mortgage 359857/1 to the Rural Banking and Finance Corporation 11.12.1981 at 9.40 a.m.

OCT 512483/2)  
16.10.1984)

Cancelled and  
CsT.26F/951,952 issued  
for Lots 16 and 17  
D.P.47504.

for A.L.R.

A.L.R.

No. 359857/2 Memorandum of Priority making  
Mortgages 359857/1 and 116057/2 first and  
second mortgages respectively - 11.12.1981 at  
9.40 a.m.

CANCELLED  
DUPLICATE DESTROYED

Variation of Mortgage 116057/2 - 28-5-1982 at  
9.08a.m.

for A.L.R.

Mortgage 384123/2 to The Bank of New South Wales -  
28-5-1982 at 9.09a.m.

for A.L.R.

Variation of Mortgage 359857/1 - 10.12.1982  
at 9.28 a.m.

for A.L.R.

Variation of Mortgage 359857/1 -  
13.9.1983 at 9.20 a.m.

for A.L.R.

for A.L.R.

PLAN No. 47504 LODGED 11.12.84

AND DEPOSITED

Northern Spy Orchards Limited,  
Transfer 507081/4 to Target Orchard  
Limited, Green Leaf Orchard Limited,  
City Side Orchard Limited, Ellesmere  
Orchard Limited, Paparua Orchard  
Limited, Export Apples Limited,  
Orchard Ride Limited, Long Acre  
Orchard Limited, Big Pick Orchard  
Limited and Red Apple Orchard  
Limited all at Timaru as tenants  
in common in equal shares -  
11.9.1984 at 11.45 a.m.

for A.L.R.

Mortgage 507081/5 to Raymond  
Sullivan Solicitors Nominee Company  
Limited - 11.9.1984 at 11.45 a.m.

for A.L.R.

PLAN No. 47539 LODGED 31/10/1984  
AND DEPOSITED 16/10/84

No. 502775/1 Compliance Certificate  
pursuant to Section 306(1)(f)(i)  
Local Government Act 1974 - 15.8.1984  
at 2.30pm.

A.L.R.





References

Prior C/T 16B/949, 951, 954.

Transfer No.

N/C. Order No. 512483/2

CANCELLED

Land and Deeds 69



# REGISTER

## CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 16th day of October one thousand nine hundred and eighty four under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that NORTHERN SPY ORCHARDS LIMITED, TARGET ORCHARD LIMITED, GREEN LEAF ORCHARD LIMITED, CITY SIDE ORCHARD LIMITED, ELLESMERE ORCHARD LIMITED, PAPAUA ORCHARD LIMITED, EXPORT APPLES LIMITED, ORCHARD RIDE LIMITED, LONG ACRE ORCHARD LIMITED, BIG PICK ORCHARD LIMITED AND RED APPLE ORCHARD LIMITED all at Timaru as tenants in common in equal shares --

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 23.0566

hectares or thereabouts being Lot 17 Deposited Plan 47504 --



for Assistant Land Registrar

### Subject to:

Mortgage 507081/5 to Raymond Sullivan Solicitors Nominee Company Limited - 11.9.1984 at 11.45am

for A.L.R.

Mortgage 557632/2 to Templeton Nominee Company Limited - 23.7.1985 at 10.47am

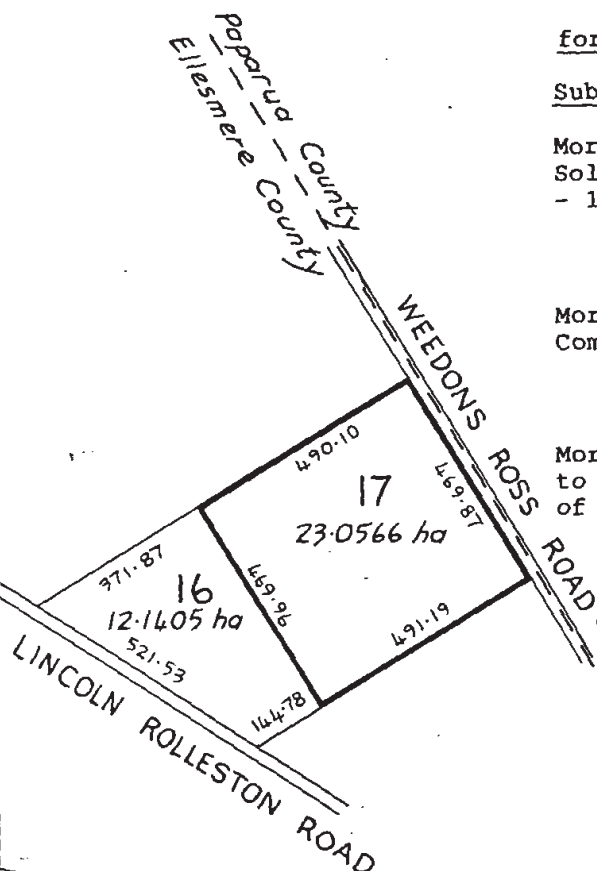
Mortgage 557632/3 of Mortgage 557632/2 to Development Finance Corporation of New Zealand - 23.7.1985 at 10.47am.

Plan 47839 deposited 22/10/1985

No. 572825/1 Compliance Certificate pursuant to Section 306(1)(f)(i) Local Government Act 1974 - 22.10.1985 at 12.10p.m.

No. 572825/2 Resolution pursuant to Section 321(3)(b) Local Government Act 1974 in respect of Lots 14 and 15 DP 47839 - 22.10.1985 at 12.10 p.m.

- O V E R -



Measurements are Metric

No. 26F / 952

No. 26F / 952

1

1

OCT.572825/3) Cancelled and New  
22.10.1985 ) CsT. issued for Lots  
on D.P.47839 as  
follows:

- 1 & 1/11th share of 12,13,14,15 - 28A/416
- 2 & 1/11th share of 12,13,14,15 - 28A/417
- 3 & 1/11th share of 12,13,14,15 - 28A/418
- 4 & 1/11th share of 12,13,14,15 - 28A/419
- 5 & 1/11th share of 12,13,14,15 - 28A/420
- 6 & 1/11th share of 12,13,14,15 - 28A/421
- 7 & 1/11th share of 12,13,14,15 - 28A/422
- 8 & 1/11th share of 12,13,14,15 - 28A/423
- 9 & 1/11th share of 12,13,14,15 - 28A/424
- 10 & 1/11th share of 12,13,14,15 - 28A/425
- 11 & 1/11th share of 12,13,14,15 - 28A/426

*Chas*  
A.L.R.

CANCELLED - DUPLICATE DESTROYED



References

Prior C/T 26F/952,953

Transfer No.

N/C. Order No. 572825/3



CANCELLED  
REGISTER

No. 28A / 417

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 22nd day of October one thousand nine hundred and eighty-five under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that NORTHERN SPY ORCHARDS LIMITED, TARGET ORCHARD LIMITED, GREEN LEAF ORCHARD LIMITED, CITY SIDE ORCHARD LIMITED, ELLESMERE ORCHARD LIMITED, PAPARUA ORCHARD LIMITED, EXPORT APPLES LIMITED, ORCHARD RIDE LIMITED, LONG ACRE ORCHARD LIMITED, BIG PICK ORCHARD LIMITED AND RED APPLE ORCHARD LIMITED all at Timaru as tenants in common in equal shares are -----

FIRSTLY

seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 4.3384

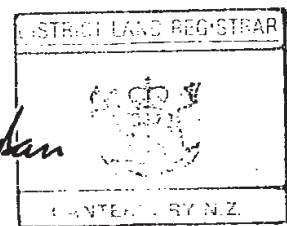
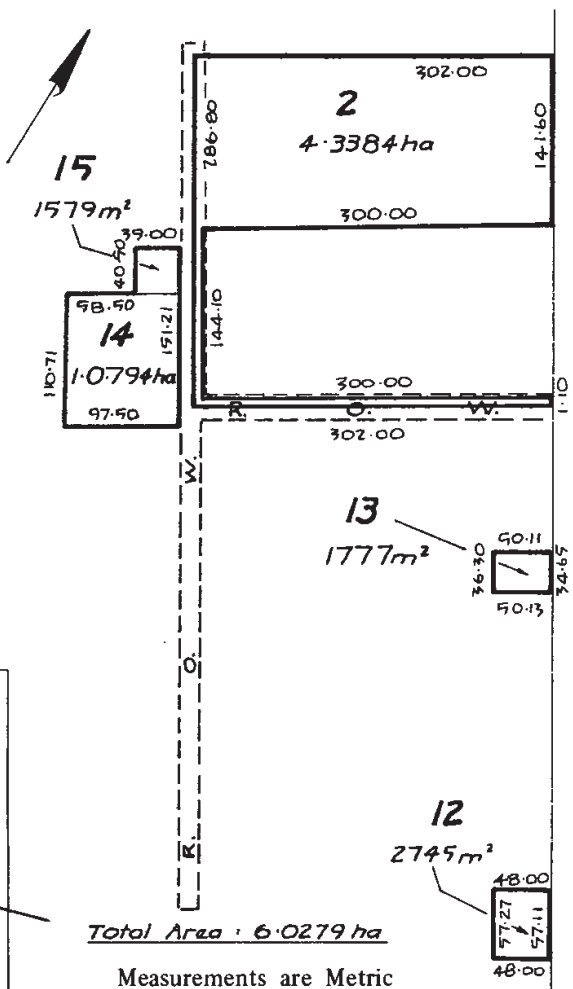
hectares or thereabouts being Lot 2 on Deposited Plan 47839 AND SECONDLY

an estate in fee simple as to an undivided one-eleventh share in all that

parcel of land containing 1.6895 hectares or thereabouts being Lots 12,13,14

and 15 on Deposited Plan 47839

Ellismere County



ASSISTANT LAND REGISTRAR

Subject to:

i. No. 572825/2 Resolution pursuant to Section 321 (3)(b) Local Government Act 1974 in respect of Lots 14 and 15 herein - 22.10.1985 at 12.10 p.m.

ii. Mortgage 557632/2 to Templeton Nominee Company Limited at 10.47 a.m.

Mortgage 557632/3 of Mortgage 557632/2 to Development Finance Corporation of New Zealand - 23.7.1985 at 10.47 a.m.

DISCHARGED

A.L.R.

A.L.R.

OVER...

No. 28A / 417

Total Area : 6.0279 ha

Measurements are Metric

ll  
xds  
25

# CERTIFICATE OF TITLE No. 28A / 417

No. 572825/4 Easement Certificate specifying intended easements on DP 47839

Mortgage A2554/3 to ASB Bank Limited - 3.7.1992 at 11.35am

Nature	Servient Tenement	Dominant Tenement
Right of Way	2B(herein)	1,3-11,
Right to drain		14 & 15
water and		(28A/416,
sewage, right		418-426)
to convey		
electric power		
telephonic		
communications		
and water		

OCT A57248/1&3 - Cancelled and NCT 37B/22.6.1993 612, 37B/602 issued for Lot 12 DP 47839 and the balance herein respectively

CANCELLED DUPLICATE DESTROYED

" " 1C,3A,4K, 2, 14 & 15  
5J,6I,7H,  
8G,9F,10E  
11D  
- 22.10.1985 at 12.10 p.m.

The easements specified in Easement Certificate 572825/4 above, when created, will be subject to Section 309 (1)(a) Local Government Act 1974

Transfer 572825/6 to Green Leaf Orchard Limited at Christchurch - 22.10.1985 at 12.10p.m.

CAVEAT 572825/16 BURNESMERE COUNTY COUNCIL - 22.10.1985 at 12.10p.m.

Mortgage 599926/8 to Nominee Company Limited 29.4.1986 at 11.03a.m.

Mortgage 599926/9 of Mortgage 599926/8 to Development Finance Corporation of New Zealand - 29.4.1986 at 11.03a.m.

Mortgage 599926/10 to Nominee Company Limited 29.4.1986 at 11.03a.m.

Mortgage 599926/11 of Mortgage 599926/10 to The National Bank of New Zealand Limited 29.4.1986 at 11.03a.m.

## References

Prior C/T 26F/952,953

Transfer No.

N/C. Order No. 572825/3



**CANCELLED**  
**REGISTER**

Land and Deeds 69

No. 28A/418

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 22nd day of October one thousand nine hundred and eighty-five under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

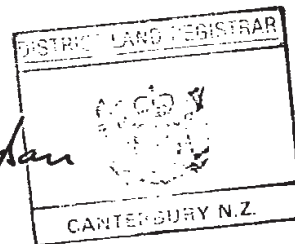
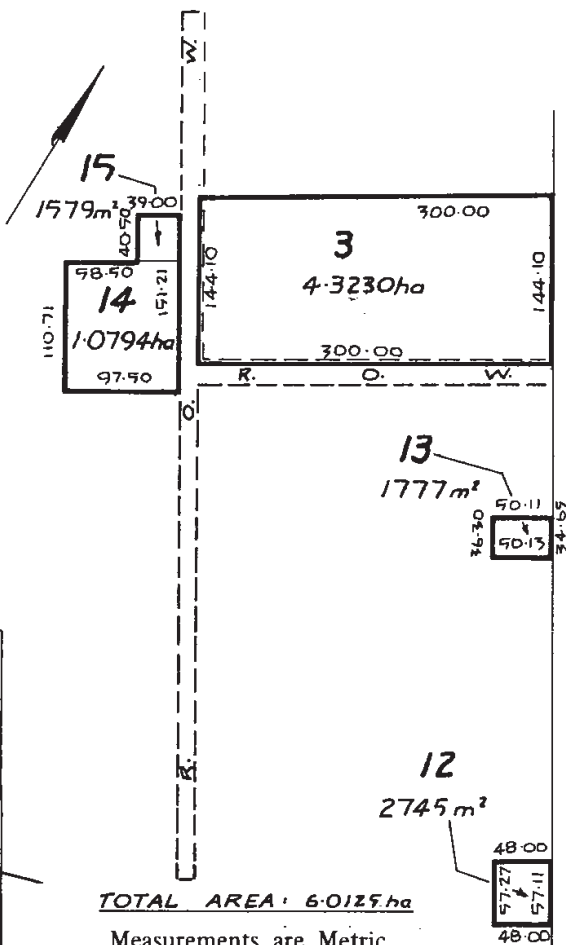
WITNESSETH that NORTHERN SPY ORCHARDS LIMITED, TARGET ORCHARD LIMITED, GREEN LEAF ORCHARD LIMITED, CITY SIDE ORCHARD LIMITED, ELLESMERE ORCHARD LIMITED, PAPAUA ORCHARD LIMITED, EXPORT APPLES LIMITED, ORCHARD RIDE LIMITED, LONG ACRE ORCHARD LIMITED, BIG PICK ORCHARD LIMITED AND RED APPLE ORCHARD LIMITED all at Timaru as tenants in common in equal shares are -----

**FIRSTLY**

~~seised~~ of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 4.3230

hectares or thereabouts being Lot 3 on Deposited Plan 47839 and **SECONDLY** an estate in fee simple as to an undivided one-eleventh share in all that parcel of land containing 1.6895 hectares or thereabouts being Lots 12, 13 14 and 15 on Deposited Plan 47839 -----

Ellesmere County



ASSISTANT LAND REGISTRAR

**Subject to:**

i. No. 572825/2 Resolution pursuant to Section 321 (3)(b) Local Government Act 1974 in respect of Lots 14 and 15 herein - 22.10.1985 at 12.10 p.m.

ii. Mortgage 557632/239 Templeton Nominee Company Limited - 23.7.1985 at 10.47 a.m.

Mortgage 557632/3 of Mortgage 557632/2 to Development Finance Corporation of New Zealand - 23.7.1985 at 10.47 a.m.

OVER...

No. 28A/418

td SKS  
2



# CERTIFICATE OF TITLE No. 28A / 418

No. 572825/4 Easement Certificate specifying intended easements on DP 47839

Mortgage A2551/3 to ASB Bank Limited - 3.7.1992 at 11.35am

<u>Nature</u>	<u>Servient Tenement</u>	<u>Dominant Tenement</u>
Right of Way 3A(herein)	1,2,4-11	
Right to drain	14,15	
water and	(28A/416,417,	
sewage, right	419-426)	
to convey		
electric power		
telephonic		
communications		
and water		

OCT A57248/1&4 - Cancelled and NCT 37B/22.6.1993 612, 37B/603 issued for Lot 12 DP 47839 and the balance herein respectively

CANCELLED DUPLICATE DESTROYED

" " 1C,2B,4K, 3,14 & 15  
5J,6I,7H,  
8G,9F,10E  
11D  
- 22.10.1985 at 12.10 p.m.

The easements specified in Easement Certificate 572825/4 above, when created, will be subject to Section 309 (1)(a) Local Government Act 1974

Transfer 572825/7 to City Side Orchard Limited at Christchurch - 22.10.1985 at 12.10p.m.

CAVEAT 572825/16 to ELLESMERE COUNTY COUNCIL - 22.10.1985 at 12.10p.m.

Mortgage 599926/12 to Templeton Nominee Company Limited - 29.4.1986 at 11.03a.m.

Mortgage 599926/13 to Mortgage 599926/12 to Development Finance Corporation of New Zealand - 29.4.1986 at 11.03a.m.

Mortgage 599926/14 to Templeton Nominee Company Limited - 29.4.1986 at 11.03a.m.

Mortgage 599926/15 of Mortgage 599926/14 to The National Bank of New Zealand Limited - 29.4.1986 at 11.03a.m.

References

Prior C/T 28A/417

Transfer No.

N/C. Order No. A57248/3

Land and Deeds 69



**REGISTER**  
**CANCELLED**

No. 37B/602

**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 22nd day of June one thousand nine hundred and ninety three under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that GREEN LEAF ORCHARD LIMITED at Christchurch ---

Firstly is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 4.3384 hectares or thereabouts being Lot 2 Deposited Plan 47839 and Secondly an estate in fee simple as to an undivided one-eleventh share in all that parcel of land containing 1.4150 hectares or thereabouts being Lots 13,14 and 15 Deposited Plan 47839 ---



Lots 14 and 15 DP 47839 are subject to:

Certificate 572825/2 pursuant to Section 321(3)(b) Local Government Act 1974 - 22.10.1985 at 12.10pm

Subject to:

Right of Way marked B on DP 47839, right to drain water and sewage, right to convey water, electric power and telephonic communications over part herein appurtenant to Lots 1,3-11,14&15 on DP 47839 (37A/601, 603-611) as specified in Easement Certificate 572825/4

The easements specified in Easement Certificate 572825/4 are subject to (now) Section 243(a) Resource Management Act 1991

Mortgage A2554/3 to ASB Bank Limited - 3.7.1992 at 11.34am

Appurtenant hereto:

Rights of Way marked C,A,K,J,I,H,G,F,E&D respectively on DP 47839, rights to drain water and sewage and rights to convey electric power, telephonic communications and water over part Lots 1,3-11 DP 47839 (37B/601,603-611) as specified in Easement Certificate 572825/4

Measurements are Metric

The easements specified in Easement Certificate 572825/4 are subject to (now) Section 243(a) Resource Management Act 1991

*[Signature]*  
A.L.R.

The within land has the benefit of a land covenant over Lot 12 DP 47839 (37B/612) contained in Transfer A69509/13 - 6.9.1993 at 11.13am

Mortgage A277254/11 to The Trustees for A.L.R. Executors and Agency Company of New Zealand Limited

No. A277254/11 Memorandum of Priority making Mortgages A277254/2 and A2554/3 first and second mortgages respectively

both on 14.1.1997 at 2.41pm

for A.L.R.

A414880.23 Transfer to Northwest Farm Limited

A414880.24 Mortgage to Bank of New Zealand

all 9.7.1999 at 12.34

for RGL

No. 37B/602

CITY ID # IS HAVE AND PHONE NO  
# INVOICE READ

1993

MEMORANDUM OF EXAMINATIONS		
NAME	APPROPRIATE TO SUBJECT AND NUMBER	DOMINANT TENDENT
1. NAME OF SUBJECT	1	4
2. NAME OF EXAMINER	2	5
3. NAME OF WITNESS	3	6
4. NAME OF JURY	4	7
5. NAME OF JURY	5	8
6. NAME OF JURY	6	9
7. NAME OF JURY	7	10
8. NAME OF JURY	8	11
9. NAME OF JURY	9	12
10. NAME OF JURY	10	13
11. NAME OF JURY	11	14
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18. NAME OF JURY	18	21
19. NAME OF JURY	19	22
20. NAME OF JURY	20	23
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22. NAME OF JURY	22	25
23. NAME OF JURY	23	26
24. NAME OF JURY	24	27
25. NAME OF JURY	25	28
26. NAME OF JURY	26	29
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107. NAME OF JURY	107	110
108. NAME OF JURY	108	111
109. NAME OF JURY	109	112
110. NAME OF JURY	110	113
111. NAME OF JURY	111	114

Application to a resolution under Section 305, Local Government Code, was filed with the Board of Health on May 2, 1972, dated May 23, 1972, at which time the Board of Health advised that the Board of Health had no objection to the application for a resolution under Section 305, Local Government Code, to amend the contract with the El Paso County Court of Probate.



Total Area	49.8854 ha.
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Comprised in C.T. 26F/952 & C.T. 26F/953.

VERIAN ROBERT FOOTER CHRISTIAN

Registered Surveyors and holder of an annual practising certificate. Every entry that this plan has been made from Surveyors required to be so under my direction (the both plan and Survey are correct and have been made in accordance with the regulations for the

9951 12P WEISSBURG

20-2nd St CHRISTCHURCH 1885 23<sup>rd</sup> A 8 1/2

of \_\_\_\_\_ 79 22 21 Signature Q. N. Jones.

[illegible]

Reference Plans: 2000-2001

[illegible]

Approved as to Survey

Approved as to journey

15-11-85  
Chief Surveyor

1020

1982

一、

Mineral Land Registrar

PP47839

6601410

[illegible]

Completion/Compliance Certificate  
No. 71281571

DIAGRAM X  
(NOT TO SCALE)

Separate Approvals/Consents  
No. 71281571

New Times 1992

Lot 1: 10.00 ACRES  
Lot 2: 1.00 ACRES  
Lot 3: 1.00 ACRES  
Lot 4: 1.00 ACRES  
Lot 5: 1.00 ACRES  
Lot 6: 1.00 ACRES  
Lot 7: 1.00 ACRES  
Lot 8: 1.00 ACRES  
Lot 9: 1.00 ACRES  
Lot 10: 1.00 ACRES  
Lot 11: 1.00 ACRES  
Lot 12: 1.00 ACRES  
Lot 13: 1.00 ACRES  
Lot 14: 1.00 ACRES  
Lot 15: 1.00 ACRES

PAPAZUA COUNTY  
ELLESMEERE COUNTY  
LINCOLN COUNTY

WEEDONS ROAD  
ROLLESTON ROAD  
LINCOLN ROAD

1561592

2  
C.P. 9745

10  
D.P. 47504

15  
43380sq ft

14  
43380sq ft

13  
43380sq ft

12  
43380sq ft

11  
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43380sq ft

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43380sq ft

1561592

MS 261	RD DISTRICT CANTERBURY HAYLEY BLK. & DIST. IV LEESTON SHEET N° M36 - 10000/3		28° 54' 00" N 10° 10' 00" W 28° 54' 00" N 10° 10' 00" W	TERRITORIAL AUTHORITY HAWKESBURY COUNTY Surveyed by MICHAELSON, GORMAN & ASSOCIATES Scale 1:4000 Date July 1984
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NO DISTIN  
RVEY BLK.  
MS 261

37B/602

A436549.1 CsT 47C/31, 33 & 39 issued for Lots 2, 13-15  
DP 47839 - 2.12.1999 at 1.57

  
For RGL

**CANCELLED**  
**DUPLICATE DESTROYED**



References

Prior C/T 28A/418

Transfer No.

N/C. Order No. A57248/4

Land and Deeds 69



**REGISTER  
CANCELLED**

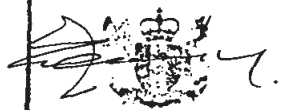
**CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT**

This Certificate dated the 22nd day of June one thousand nine hundred and ninety three under the seal of the District Land Registrar of the Land Registration District of CANTERBURY

WITNESSETH that CITY SIDE ORCHARD LIMITED at Christchurch ---

Firstly is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 4.3230 hectares or thereabouts being Lot 3 Deposited Plan 47839 and Secondly an estate in fee simple as to an undivided one-eleventh share in all that parcel of land containing 1.4150 hectares or thereabouts being Lots 13,14 and 15 Deposited Plan 47839

DISTRICT LAND REGISTRAR



ASSISTANT LAND REGISTRAR

Lots 14 and 15 DP 47839 are subject to:

Certificate 572825/2 pursuant to Section 321(3)(b) Local Government Act 1974 - 22.10.1985 at 12.10pm

Subject to:

Right of Way marked A on DP 47839, right to drain water and sewage, right to convey water, electric power and telephonic communications over part herein appurtenant to Lots 1,2,4-11,14&15 on DP 47839 (37A/601, 602,604-611) as specified in Easement Certificate 572825/4

The easements specified in Easement Certificate 572825/4 are subject to (now) Section 243(a) Resource Management Act 1991

Mortgage A2551/3 to ASB Bank Limited - 3.7.1992 at 11.35am

Appurtenant hereto:

Rights of Way marked C,B,K,J,I,H,G,F,E&D respectively on DP 47839, rights to drain water and sewage and rights to convey electric power, telephonic communications and water over part Lots 1,2,4-11 DP 47839 (37B/601,602,604-611) as specified in Easement Certificate 572825/4

The easements specified in Easement Certificate 572825/4 are subject to (now) Section 243(a) Resource Management Act 1991

A.L.R.

The within land has the benefit of a land covenant over Lot 12 DP 47839 (37B/612) contained in Transfer A69509/13 - 6.9.1993 at 11.13am

Mortgage A277254/3 for A.L.R. The Trustees Executors and Agency Company of New Zealand Limited

No. A277254/11 Memorandum of Priority making Mortgages A277254/3 and A2551/3 first and second mortgages respectively

both on 14.1.1997 at 2.41pm

for A.L.R.

A414880.23 Transfer to Northwest Farm Limited

A414880.24 Mortgage to Bank of New Zealand

all 9.7.1999 at 12.34

for RGL

Measurements are Metric

No. 37B/603

No.

No. 37B/603





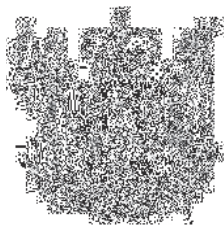
37B/603

A436549.1 CsT 47C/32, 33 & 39 issued for Lots 3, 13-15  
DP 47839 - 2.12.1999 at 1.57

  
For RGL

CANCELLED  
DUPLICATE DESTROYED





**RECORD OF TITLE**  
**UNDER LAND TRANSFER ACT 2017**  
**FREEHOLD**  
**Historical Search Copy**



  
R.W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier**                      **CB47C/31**  
**Land Registration District**   **Canterbury**  
**Date Issued**                      02 December 1999

**Prior References**  
CB37B/602

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**Estate**                      Fee Simple  
**Area**                      4.3384 hectares more or less  
**Legal Description**      Lot 2 Deposited Plan 47839

**Original Registered Owners**  
Lindsay James Officer and Laura Elizabeth Revill

---

**Interests**

572825.4 Easement Certificate specifying the following easements - 22.10.1985 at 12.10 pm

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 2 Deposited Plan 47839 - herein	B DP 47839	Lot 1 Deposited Plan 47839	
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 2 Deposited Plan 47839 - herein	B DP 47839	Lot 3-11 Deposited Plan 47839	
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 2 Deposited Plan 47839 - herein	B DP 47839	Lot 14 Deposited Plan 47839	

Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 2 Deposited Plan 47839 - herein	B DP 47839	Lot 15 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 1 Deposited Plan 47839	C DP 47839	Lot 2 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839	A DP 47839	Lot 2 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 4 Deposited Plan 47839	K DP 47839	Lot 2 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 5 Deposited Plan 47839	J DP 47839	Lot 2 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 6 Deposited Plan 47839	I DP 47839	Lot 2 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 7 Deposited Plan 47839	H DP 47839	Lot 2 Deposited Plan 47839 - herein



Right of way, right to drain water and sewage, right to convey water, electric power and	Lot 8 Deposited Plan 47839	G DP 47839	Lot 2 Deposited Plan 47839 - herein
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telephonic

communications

Right of way, right to drain water and sewage, right to convey water, electric power and telephonic	Lot 9 Deposited Plan 47839	F DP 47839	Lot 2 Deposited Plan 47839 - herein
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communications

Right of way, right to drain water and sewage, right to convey water, electric power and telephonic	Lot 10 Deposited Plan 47839	E DP 47839	Lot 2 Deposited Plan 47839 - herein
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communications

Right of way, right to drain water and sewage, right to convey water, electric power and telephonic	Lot 11 Deposited Plan 47839	D DP 47839	Lot 2 Deposited Plan 47839 - herein
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communications

The easements specified in Easement Certificate 572825.4 are subject to Section 309(1)(a) Local Government Act 1974

Land Covenant in Transfer A69509.13 - 6.9.1993 at 11.13 am

Land Covenant in Transfer A436549.2 - 2.12.1999 at 1.57 pm

A450130.1 Transfer creating the following easements in gross - 15.3.2000 at 12.55 pm

Type	Servient Tenement	Easement Area	Grantee	Statutory Restriction
Right to convey electric power	Lot 2 Deposited Plan 47839 - herein	B DP 82278	Orion New Zealand Limited	

5080216.1 Notice of marriage of Lindsay James Officer to Laura Elizabeth Revill - 6.9.2001 at 3:48 pm

5080216.2 Mortgage to Westpac Banking Corporation - 6.9.2001 at 3:48 pm

5538251.1 Variation of Mortgage 5080216.2 - 1.4.2003 at 9:00 am

5951441.1 Discharge of Mortgage 5080216.2 - 31.3.2004 at 9:00 am

5951441.2 Transfer to Lindsay James Officer (3/10 share) and Laura Elizabeth Officer (7/10 share) - 31.3.2004 at 9:00 am

5951441.3 Transfer to Lindsay James Officer and Laura Elizabeth Officer - 31.3.2004 at 9:00 am

5951441.4 Mortgage to Westpac Banking Corporation - 31.3.2004 at 9:00 am

7095691.1 Application pursuant to Section 99A Land Transfer Act 1952 vesting Mortgage 5951441.4 in Westpac New Zealand Limited - 2.11.2006 at 9:00 am

7958492.1 Variation of Mortgage 5951441.4 - 7.10.2008 at 9:00 am

12109687.1 Discharge of Mortgage 5951441.4 - 7.5.2021 at 4:25 pm

12109687.2 Bond pursuant to Section 108(2)(b) Resource Management Act 1991 - 7.5.2021 at 4:25 pm

12109687.3 Transfer to Aidan Robert Boniface and Joanne Margaret Boniface - 7.5.2021 at 4:25 pm

12109687.4 Mortgage to Kiwibank Limited - 7.5.2021 at 4:25 pm

## Reference:

Prior CT: 37B/602

Document No.: A436549.1



LT69

## REGISTER

47C/31

## CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT 1952

**This Certificate** dated the 2nd day of December One Thousand Nine Hundred and Ninety Nine under the seal of the Registrar-General of Land, New Zealand, for the Land Registration District of CANTERBURY

**WITNESSETH** that **NORTHWEST FARM LIMITED**

is seised of an estate in **fee simple** (subject to such reservations, restrictions, encumbrances and interests as are notified by memorial endorsed hereon) in the land hereinafter described, delineated on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 4.3384 hectares, more or less being **LOT 2 DEPOSITED PLAN 47839**



Appurtenant hereto is a right of way, right to drain water & sewage, right to convey water, electric power & telephonic communications over part Lots 1, 3-11 marked C, A, K, J, I, H, G, F, E & D respectively on DP 47839 CsT 47C/30, 47C/32-40 as specified in Easement Certificate 572825.4

A453086.1 Transfer to Lindsay James Officer and Laura Elizabeth Revill - 5.4.2000 at 11.20

The easements specified in Easement Certificate 572825.4 are subject to Section 309(1)(a) Local Government Act 1974

*[Signature]*  
for RGL

Subject to a right of way, right to drain water & sewage, right to convey water, electric power & telephonic communications over part herein marked B on DP 47839 appurtenant to Lots 1, 3-11, 14 & 15 DP 47839 CsT 47C/30, 32-40 as specified in Easement Certificate 572825.4

The easements specified in Easement Certificate 572825.4 are subject to Section 309(1)(a) Local Government Act 1974

All 22.10.1985 at 12.10

Land covenant in Transfer A69509.13 - 6.9.1993 at 11.13

A414880.24 Mortgage to Bank of New Zealand - 9.7.1999 at 12.34

A436549.2 Transfer to Northwest Farm Limited

Land covenant in Transfer A436549.2

All 2.12.1999 at 1.57

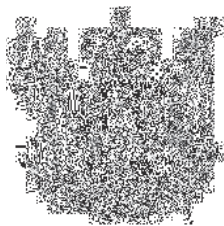
*[Signature]*  
For RGL

Subject to a right to convey electric power in gross over the part herein marked B on DP 82278 to Orion New Zealand Limited created by Transfer A450130.1 - 15.3.2000 at 12.55

*[Signature]*  
for RGL

47C/31

Historical Search Copy Dated 02/09/24 9:33 am, Page 5 of 5



**RECORD OF TITLE**  
**UNDER LAND TRANSFER ACT 2017**  
**FREEHOLD**  
**Historical Search Copy**



  
R.W. Muir  
Registrar-General  
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

**Identifier**                      **CB47C/32**  
**Land Registration District**   **Canterbury**  
**Date Issued**                      02 December 1999

**Prior References**  
CB37B/603

---

**Estate**                      Fee Simple  
**Area**                      4.3230 hectares more or less  
**Legal Description**      Lot 3 Deposited Plan 47839

**Original Registered Owners**  
Northwest Farm Limited

---

**Interests**

572825.4 Easement Certificate specifying the following easements - 22.10.1985 at 12.10 pm

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 1 Deposited Plan 47839	C DP 47839	Lot 3 Deposited Plan 47839 - herein	
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 2 Deposited Plan 47839	B DP 47839	Lot 3 Deposited Plan 47839 - herein	
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 4 Deposited Plan 47839	K DP 47839	Lot 3 Deposited Plan 47839 - herein	



Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 5 Deposited Plan 47839	J DP 47839	Lot 3 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 6 Deposited Plan 47839	I DP 47839	Lot 3 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 7 Deposited Plan 47839	H DP 47839	Lot 3 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 8 Deposited Plan 47839	G DP 47839	Lot 3 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 9 Deposited Plan 47839	F DP 47839	Lot 3 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 10 Deposited Plan 47839	E DP 47839	Lot 3 Deposited Plan 47839 - herein
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 11 Deposited Plan 47839	D DP 47839	Lot 3 Deposited Plan 47839 - herein

Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 1 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 2 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 4 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 5 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 6 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 7 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 8 Deposited Plan 47839

Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 9 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 10 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 11 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 14 Deposited Plan 47839
Right of way, right to drain water and sewage, right to convey water, electric power and telephonic communications	Lot 3 Deposited Plan 47839 - herein	A DP 47839	Lot 15 Deposited Plan 47839

The easements specified in Easement Certificate 572825.4 are subject to Section 309(1)(a) Local Government Act 1974

Land Covenant in Transfer A69509.13 - 6.9.1993 at 11.13 am

Land Covenant in Transfer A436549.2 - 2.12.1999 at 1.57 pm

A450130.1 Transfer creating the following easements in gross - 15.3.2000 at 12.55 pm

Type	Servient Tenement	Easement Area	Grantee	Statutory Restriction
Right to convey electric power	Lot 3 Deposited Plan 47839 - herein	A DP 82278	Orion New Zealand Limited	
5197545.1 Transfer to Dean James Aitken, Edith Lorraine Aitken and William Gavin Hayes - 23.4.2002 at 9:00 am				
5197545.2 Mortgage to ASB Bank Limited - 23.4.2002 at 9:00 am				
6749884.1 Transmission to Edith Lorraine Aitken and William Gavin Hayes as survivors - 13.2.2006 at 9:00 am				
6749884.2 Transfer to Edith Lorraine Aitken and Lindsay James Officer - 13.2.2006 at 9:00 am				
7740875.1 Transfer to Edith Lorraine Aitken and Bevin Ian Godfrey - 11.3.2008 at 3:19 pm				
7774576.1 Correction of Name of Edith Lorraine Aitken to Lorraine Edith Aitken - 7.4.2008 at 9:00 am				
9963194.1 Discharge of Mortgage 5197545.2 - 24.4.2015 at 2:38 pm				
9963194.2 Transfer to Aaron Michael Kenny and Sarah Lee Meehan - 24.4.2015 at 2:38 pm				
9963194.3 Mortgage to Westpac New Zealand Limited - 24.4.2015 at 2:38 pm				
13088116.1 Discharge of Mortgage 9963194.3 - 23.8.2024 at 3:34 pm				

13088116.2 Transfer to Yoursection Limited - 23.8.2024 at 3:34 pm

13088116.3 Mortgage to Aaron Michael Kenny and Sarah Lee Kenney - 23.8.2024 at 3:34 pm



## Reference:

Prior CT: 37B/603

Document No.: A436549.1



## REGISTER

LT69

47C/32

## CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT 1952

This Certificate dated the 2nd day of December One Thousand Nine Hundred and Ninety Nine under the seal of the Registrar-General of Land, New Zealand, for the Land Registration District of CANTERBURY

**WITNESSETH that NORTHWEST FARM LIMITED**

is seised of an estate in fee simple (subject to such reservations, restrictions, encumbrances and interests as are notified by memorial endorsed hereon) in the land hereinafter described, delineated on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 4.3230 hectares, more or less being **LOT 3 DEPOSITED PLAN 47839**



Appurtenant hereto is a right of way, right to drain water & sewage, right to convey water, electric power & telephonic communications over part Lots 1, 2, 4-11 marked C, B, K, J, I, H, G, F, E & D respectively on DP 47839 CsT 47C/30, 31, 33-40 as specified in Easement Certificate 572825.4

The easements specified in Easement Certificate 572825.4 are subject to Section 309(1)(a) Local Government Act 1974

Subject to a right of way, right to drain water & sewage, right to convey water, electric power & telephonic communications over part herein marked A on DP 47839 appurtenant to Lots 1, 2, 4-11, 14 & 15 DP 47839 CsT 47C/30, 31, 33-40 as specified in Easement Certificate 572825.4

The easements specified in Easement Certificate 572825.4 are subject to Section 309(1)(a) Local Government Act 1974

All 22.10.1985 at 12.10

Land covenant in Transfer A69509.13 - 6.9.1993 at 11.13

A414880.24 Mortgage to Bank of New Zealand - 9.7.1999 at 12.34

A436549.2 Transfer to Northwest Farm Limited

Land covenant in Transfer A436549.2

All 2.12.1999 at 1.57

Subject to a right to convey electric power in gross over the part herein marked A on DP 82278 to Orion New Zealand Limited created by Transfer A450130.1 - 15.3.2000 at 12.55

*[Signature]*  
for RGL

47C/32

Transaction ID 3757303  
Client Reference 897 - 1/487 Weedons Road

# NEW ZEALAND.

Form B.

Reference: { Vol. 3, folio 69  
Substituted  
Transfer No.  
Application No 8074.



Register-book,  
Vol 174 folio 27

12/00/1998-2008

174/27

## CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

This Certificate, dated the third day of August, one thousand eight hundred and ninety two, under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury Witnesseth that George Trott of Springfield Farmer

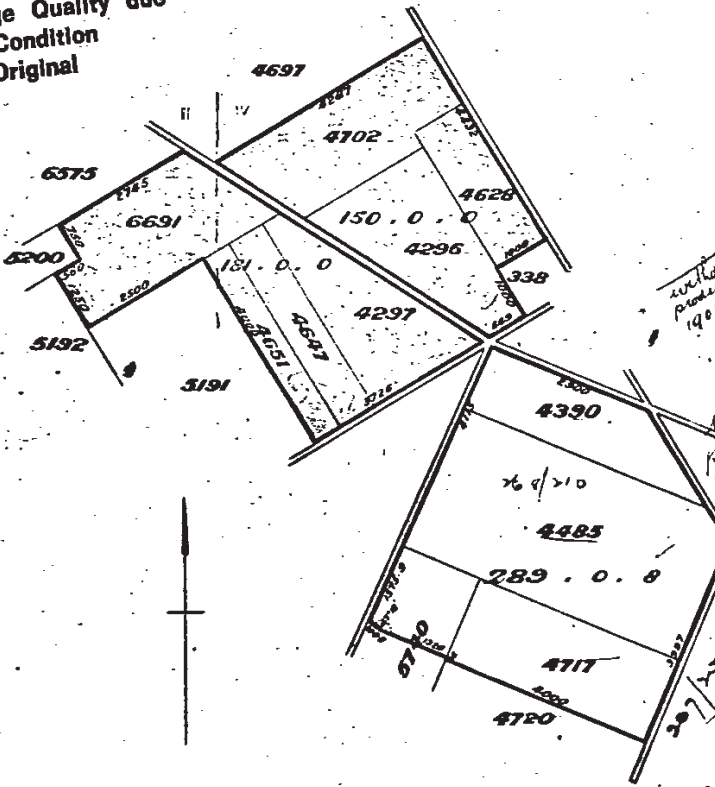
is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or indorsed hereon; subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon, bordered green, be the several admeasurements a little more or less, that is to say: All that parcel of land containing together six hundred and twenty acres and eight furlongs situated in Block IV of the Lower Survey District comprising Rural Sections 4296, 4297, 4390, 4485, 4628, 4647, 4651, 4702, 4717 and 6691 and part of Rural Section 5740.



G. B. Smith  
District Land Registrar

CANCELLED  
AS TO PART COLOURED RED.

Image Quality due  
to Condition  
of Original



Outstanding Mortgage Registered:  
No. 91547 George Trott to George Henry  
Moore affecting Rural Sections 4296,  
4297, 4390, 4485, 4628, 4647, 4651, and 4702  
and DISCHARGED  
26.5.1923. W. B. D. L. R. G. B. Smith D. L. R.  
Mortgage 57606 produced at 2 p.m. 1897 at 445 p.m. George Trott to George  
Henry DISCHARGED 17.7.1907 and  
6691. 26.5.1923. W. B. D. L. R. G. B. Smith D. L. R.  
Mortgage 57606 produced at 2 p.m. 1897 at 445 p.m. George Trott to George  
Henry DISCHARGED 17.7.1907 and  
6691. 26.5.1923. W. B. D. L. R. G. B. Smith D. L. R.

Mortgage 57606 produced at 2 p.m. 1897 at 445 p.m. George Trott to George  
Henry DISCHARGED 17.7.1907 and  
6691. 26.5.1923. W. B. D. L. R. G. B. Smith D. L. R.  
Mortgage 57606 produced at 2 p.m. 1897 at 445 p.m. George Trott to George  
Henry DISCHARGED 17.7.1907 and  
6691. 26.5.1923. W. B. D. L. R. G. B. Smith D. L. R.  
Mortgage 57606 produced at 2 p.m. 1897 at 445 p.m. George Trott to George  
Henry DISCHARGED 17.7.1907 and  
6691. 26.5.1923. W. B. D. L. R. G. B. Smith D. L. R.

Scale: 20 chains to an inch

W. B. D. L. R.

174/27

174/27

Mortgage books produced 15 March 1911 at 156 p.  
George Froth to Arthur Edgar Gravenor Rhode  
and Arthur Shewellyn Parkes and John  
Matthews Parker and Robert Peter Rhodes  
and Robert Heaton Rhodes and Arthur  
Edgar Gravenor Rhode. *at 156 p.*

Mortgage books produced 15 March 1911 at  
156 p. George Froth to Arthur Edgar  
Gravenor Rhodes. *at 156 p.*

268/310

Transfer 1775 produced 10 October 1911 at 3 p.  
George Froth to David Marshall of balance  
account. *at 3 p.*

Cancellor

CERTIFICATE OF TITLE,

Vol. , folio

174/27



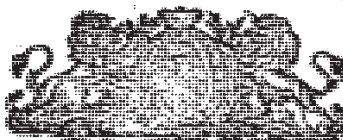


NEW ZEALAND.

CANCELLED

[Form B.]

Reference: Vol. 179, folio 27  
Transfer No. 59776



Register-book,

Vol. 207, folio 200

# CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

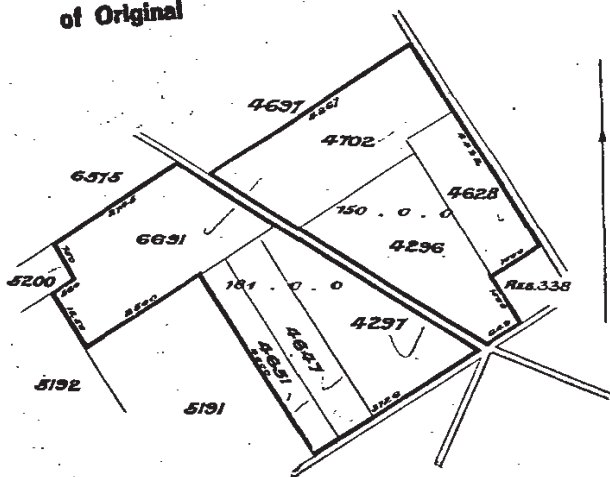
This Certificate, dated the nineteenth day of May, one thousand nine hundred and three, under the hand and seal of the District Land Registrar of the Land Registration District of Canterbury, William McNeenan of Springston Farmer Witnesseth that

is seized of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or indorsed hereon; subject also to any existing right of the Crown to take and lay off roads under the provisions of any Act of the General Assembly of New Zealand) in the land hereinafter described, as the same is delineated by the plan hereon, bordered green be the several admeasurements a little more or less, that is to say: All ~~that~~ <sup>those</sup> parcels of land containing together three hundred and thirty one acres or thereabouts situated in Block IV of the Eastern Cuvy District comprising rural sections 4296 4297 4298 4299 4300 4301 4302 and 4303



W. P. P. P.  
District Land Registrar

Image Quality due  
to Condition  
of Original



Scale: 20 chains to an inch.

Mortgage 51269 produced 26 May 1903 at 2 pm George Tickell to Annie DISCHARGED 31.5.1907 W. P. P. P. W. P. P. P.

Mortgage 51270 produced 26 May 1903 at 2 pm William McNeenan to Joseph DISCHARGED 27.5.1907 W. P. P. P. W. P. P. P.

Transfer 44002 produced 27 March 1907 at 2.50 pm William McNeenan to Ellen Page of Christchurch Spinster DISCHARGED 27.3.1907 W. P. P. P. W. P. P. P.

Mortgage 64675 produced 21 May 1907 at 2.15 pm Ellen Page to Annie DISCHARGED 17.7.1907 W. P. P. P. W. P. P. P.  
Certificate of Mortgage 718 of Ellen Page with Andrew Paddock of Springston Farmer at Christchurch on 14 June 1907 produced 6 August 1907 at 2.15 pm W. P. P. P. W. P. P. P.

Transfer of 22973 produced 6 July 1907 at 11.30 am Ellen Paddock to Walter Wright of Springston Farmer DISCHARGED 22.7.1907 W. P. P. P. W. P. P. P.

Mortgage 85724 produced 17 May 1912 at 3.15 pm Walter Wright to Annie DISCHARGED 17.5.1912 W. P. P. P. W. P. P. P.

Transmission 9617 of Mortgage 85724 to Alfred Arnaud Morris McKellar, Cecil George McKellar, William Lindsay Macbeth and Frederick Henry Pyne. Entered 22 March, 1915 at 11.49 am W. P. P. P. W. P. P. P.

207/200  
Transmission 20333 of Mortgage 85724 to  
the above named Alfred Arnaud Morris, Cecil  
George McKellar and Norman Lindsay Macbeth. Entered  
21 December, 1915, at 10.15 am. *Q. & L.R.*

Extension of mortgage 85724 and increase of rate of  
interest produced 21 December 1914 at 11.51 am. *Q. & L.R.*

Transmission No. 14451 of Mortgage No.  
85724 to Cecil George McKellar and  
Norman Lindsay Macbeth. Entered 27/1/15  
at 12.0.0. *Q. & L.R.*

Transfer 146982 produced 1<sup>st</sup> July 1922 at 11.20 am  
Walter Wright to William Henry Peter  
Scurden of Springston, Durham. *Q. & L.R.*

Variation of the terms of mortgage 85724  
produced 27<sup>th</sup> of 1922 at 11.25 am. *Q. & L.R.*

Variation of the terms of mortgage 85724 produced  
30 June 1930 at 3.00 pm. *Q. & L.R.*

Transmission 23446 of mortgage 85724  
to Cecil George McKellar entered 3  
November 1931 at 3 pm. *Q. & L.R.*

Transfer 200583 of mortgage 85724 Cecil  
George McKellar to Frank Sturmes  
Widing and George McKellar  
produced 3 December 1931 at 3 pm. *Q. & L.R.*

Transfer 204594 produced 19<sup>th</sup> June 1933 at  
11.56 am. William Henry Peter Scurden to  
Duncan Gillanders of Springston, Durham. *Q. & L.R.*

Mortgage 184635 produced 19 June 1933 at  
11.56 am. Duncan Gillanders to Godfrey  
Roscoe of Springston, Durham. *Q. & L.R.*

Mortgage 184636 produced 19 June 1933 at  
11.57 am. Duncan Gillanders to William Henry  
Peter Scurden. *Q. & L.R.*

Mortgage 184637 produced 19 June 1933 at  
11.58 am. Duncan Gillanders to Donald  
Gillanders. *Q. & L.R.*

Mortgage 188705 produced 16<sup>th</sup> June 1938 at  
2.20 pm. Duncan Gillanders to Godfrey  
Roscoe, George McKellar and the  
Douglas Robert Hamilton and Edmund  
Wellsby Reeves in shares. *Q. & L.R.*

Mortgage 188706 produced 16<sup>th</sup> June 1938  
Duncan Gillanders to  
Donald Gillanders. *Q. & L.R.*

20  
Transfer 25888 produced 22 November  
1915 at 11.49 am. Duncan Gillanders to  
Thomas Reid a member of H.M. Armed  
forces. *Q. & L.R.*

Mortgage 233001 produced 16 November  
1915 at 11.51 am. Duncan Gillanders to the  
State Advanced Corporation of 100 Leas.  
*Q. & L.R.*

Transfer 240400 produced 24<sup>th</sup> October 1953 at 11.27 am  
Errol. *Q. & L.R.*

THIS REPRODUCTION (ON A REDUCED SCALE)  
CERTIFIED TO BE A TRUE COPY OF THE  
ORIGINAL REGISTERED FOR THE PURPOSES OF  
THE LAND TRANSFER ACT 1952.  
*Q. & L.R.*

OCT 77158/1 } Cancelled and  
26.4.1976 } C.T.'s 16B/949-  
955 issued for  
R.S.'s 4296, 4297,  
4628, 4647, 4651  
4702 and 6691

CANCELLED  
DUPLICATE DESTROYED

CERTIFICATE OF TITLE,

Vol. , folio

## **Appendix B – LLUR Statement**

# Property Statement from the Listed Land Use Register

Visit [ecan.govt.nz/HAIL](https://ecan.govt.nz/HAIL) for more information or  
contact Customer Services at [ecan.govt.nz/contact/](https://ecan.govt.nz/contact/) and quote ENQ389092

**Date generated:** 01 September 2024  
**Land parcels:** Lot 2 DP 47839  
Lot 3 DP 47839



The information presented in this map is specific to the area within a 100m radius of property you have selected. Information on properties outside the search radius may not be shown on this map, even if the property is visible.

## Sites at a glance

 **Sites within enquiry area**

Site number	Name	Location	HAIL activity(s)	Category
118904	503, 1/487, 2/487, 3/487, 4/487, 6/487, 503, 7/487, 8/487, 9/487, 10/487, 11/487 Weedons Rd	503, 1/487, 2/487, 3/487, 4/487, 6/487, 503, 7/487, 8/487, 9/487, 10/487, 11/487 Weedons Rd	A10 - Persistent pesticide bulk storage or use;	Not Investigated

Please note that the above table represents a summary of sites and HAILS intersecting the area of enquiry only.

 **Nearby sites**

Site number	Name	Location	HAIL activity(s)	Category
235788	6/487 Weedons Road, Rolleston	6/487 Weedons Road, Rolleston	A10 - Persistent pesticide bulk storage or use;	Yet to be reviewed

Please note that the above table represents a summary of sites and HAILS intersecting the area of enquiry within a 100m buffer.

## More detail about the sites



**Site 118904: 503, 1/487, 2/487, 3/487, 4/487, 6/487, 503, 7/487, 8/487, 9/487, 10/487, 11/487****Weedons Rd** (Intersects enquiry area.)

Category: Not Investigated  
Definition: Verified HAIL has not been investigated.

Location: 503, 1/487, 2/487, 3/487, 4/487, 6/487, 503, 7/487, 8/487, 9/487, 10/487, 11/487 Weedons Rd  
Legal description(s): Lot 1 DP 427521, Lot 1 DP 47839, Lot 10 DP 47839, Lot 11 DP 47839, Lot 14 DP 47839, Lot 15 DP 47839, Lot 2 DP 427521, Lot 2 DP 47839, Lot 3 DP 47839, Lot 4 DP 47839, Lot 5 DP 47839, Lot 6 DP 47839, Lot 8 DP 47839, Lot 9 DP 47839, Part Lot 7 DP 47839

HAIL activity(s):	Period from	Period to	HAIL activity
	1994	Present	Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

**Notes:**

**5 Nov 2014** This record was created as part of the Selwyn District Council 2015 HAIL identification project.  
**5 Nov 2014** Orchard developed around 1984. Extent of planting seen on Canterbury Maps historical imagery 1994

**Investigations:**

**INV 383544** **Soil Contamination Risk Detailed Site Investigation Report & Remediation Action Plan 148, 156, 178 Lincoln Rolleston Rd & 6/487 Weedons Rd, Rolleston**  
Momentum Environmental Limited - Detailed Site Investigation  
26 Mar 2024

**Summary of investigation(s):**

Environment Canterbury has received a Detailed Site Investigation report that includes all or part of the property you have selected.

A DSI seeks to identify the type, extent and level of contamination (if any) in an area. Soil, soil-gas or water samples will have been collected and analysed.

This investigation has not been summarised.

**Site 235788: 6/487 Weedons Road, Rolleston** (Within 100m of enquiry area.)

Category: Yet to be reviewed  
Definition: Investigation reports have been received for this site, but we have not yet reviewed them.

Location: 6/487 Weedons Road, Rolleston  
Legal description(s): Lot 10 DP 47839

HAIL activity(s):	Period from	Period to	HAIL activity
	1994	Present	Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

**Notes:**

**7 Jun 2019** This record was created as part of the Selwyn District Council 2015 HAIL identification project.  
**7 Jun 2019** Orchard developed around 1984. Extent of planting seen on Canterbury Maps historical imagery 1994

**Investigations:**

**INV 235786** **Detailed Site Investigation - 6/487 Weedons Road, Rolleston**  
Pattle Delamore Partners Ltd - Detailed Site Investigation

4 Jun 2019

### Summary of investigation(s):

Environment Canterbury has received a Detailed Site Investigation report that includes all or part of the property you have selected.

A DSI seeks to identify the type, extent and level of contamination (if any) in an area. Soil, soil-gas or water samples will have been collected and analysed.

This investigation has not been summarised.



### Nearby investigations of interest

There are no investigations associated with the area of enquiry.

## Disclaimer

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987.

The information contained in this report reflects the current records held by Environment Canterbury regarding the activities undertaken on the site, its possible contamination and based on that information, the categorisation of the site. Environment Canterbury has not verified the accuracy or completeness of this information. It is released only as a copy of Environment Canterbury's records and is not intended to provide a full, complete or totally accurate assessment of the site. It is provided on the basis that Environment Canterbury makes no warranty or representation regarding the reliability, accuracy or completeness of the information provided or the level of contamination (if any) at the relevant site or that the site is suitable or otherwise for any particular purpose. Environment Canterbury accepts no responsibility for any loss, cost, damage or expense any person may incur as a result of the use, reference to or reliance on the information contained in this report.

Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

## Appendix C – Historical Aerial Photographs

# 1942 Aerial

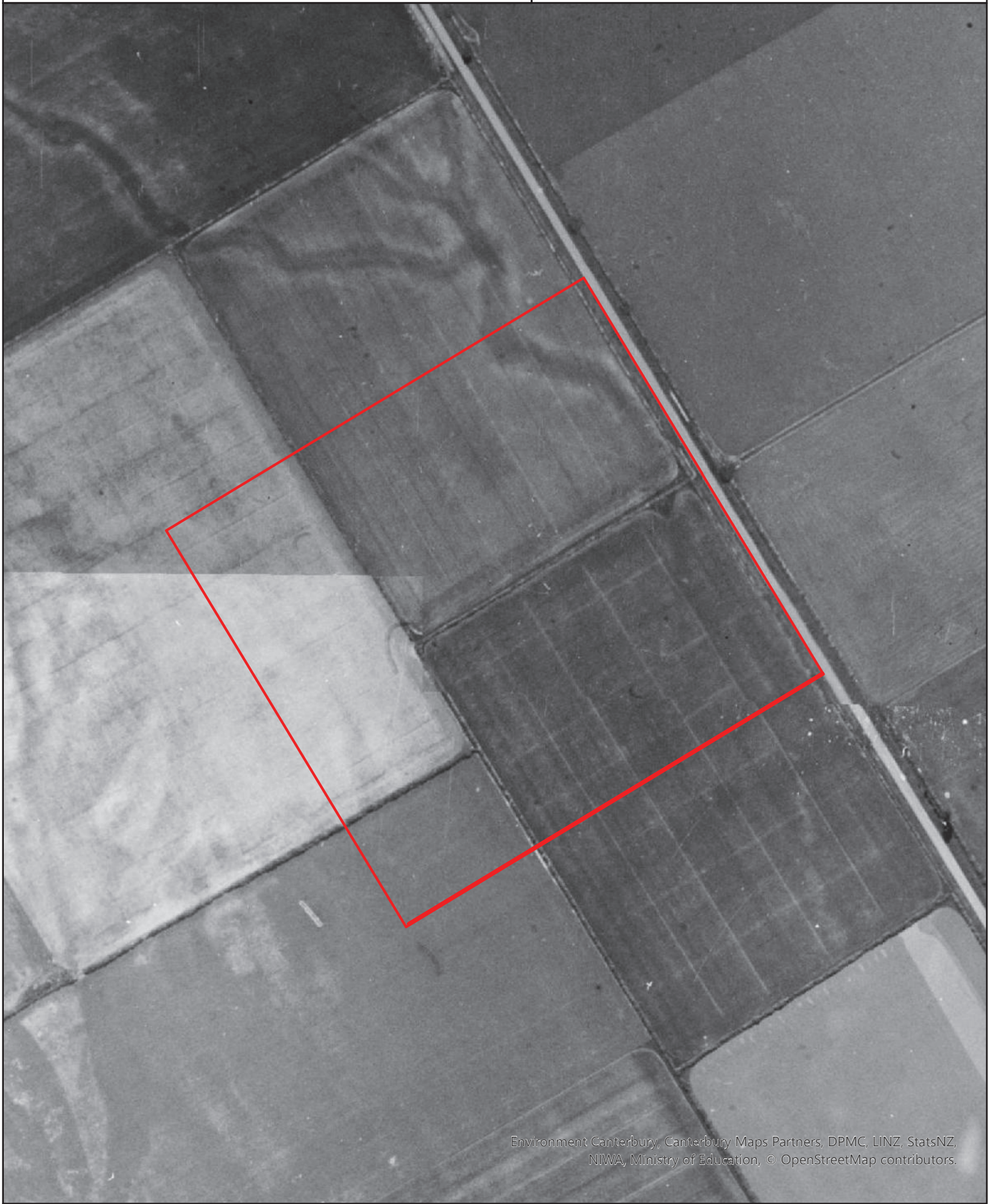
Information has been derived from various organisations, including Environment Canterbury and the Canterbury Maps partners. Boundary information is derived under licence from LINZ Digital Cadastral Database (Crown Copyright Reserved). Environment Canterbury and the Canterbury Maps partners do not give and expressly disclaim any warranty as to the accuracy or completeness of the information or its fitness for any purpose.

Information from this map may not be used for the purposes of any legal disputes. The user should independently verify the accuracy of any information before taking any action in reliance upon it.



Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:29 AM





# 1961 Aerial

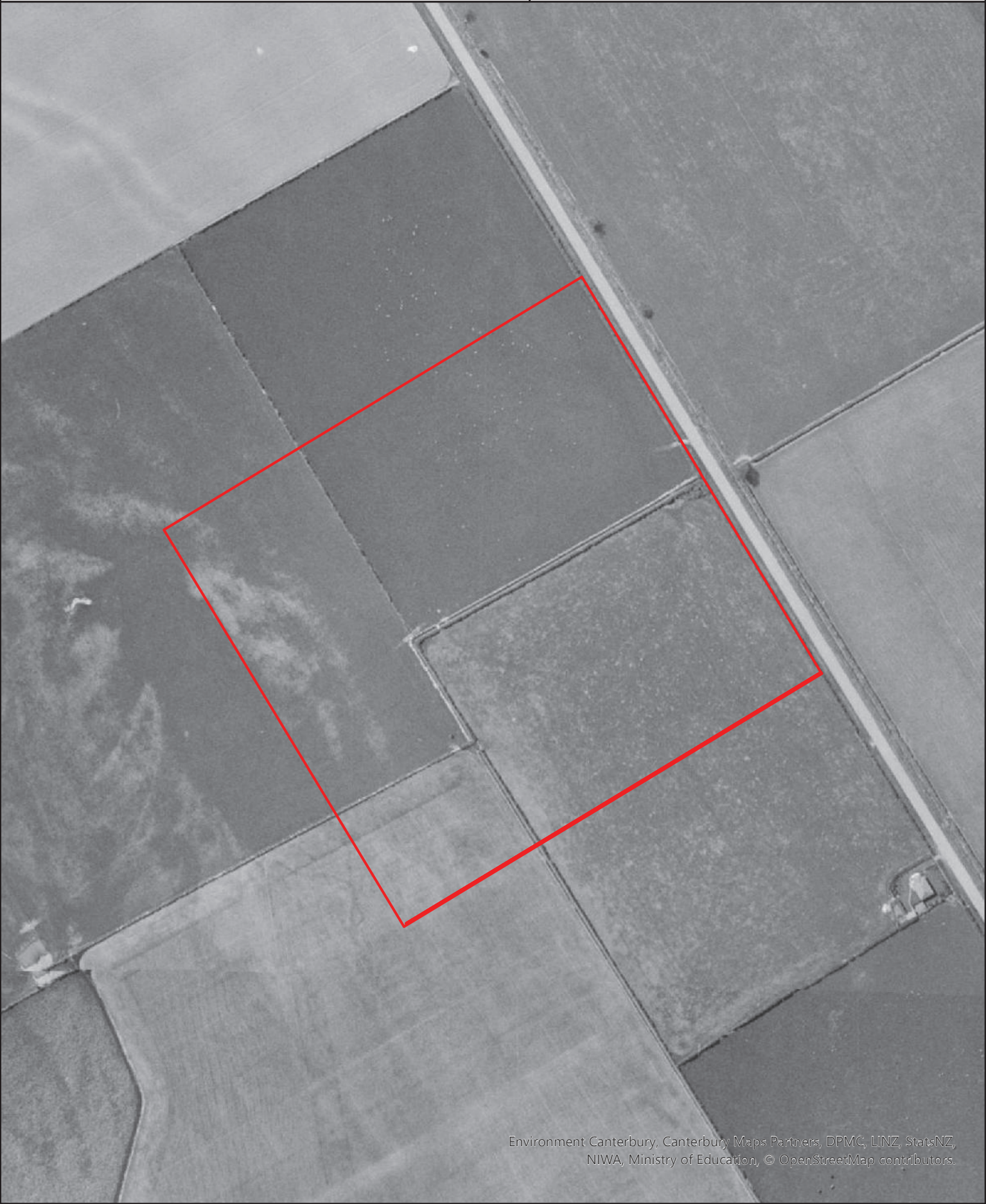
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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:30 AM





# 1974 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:30 AM





# 1982 Aerial

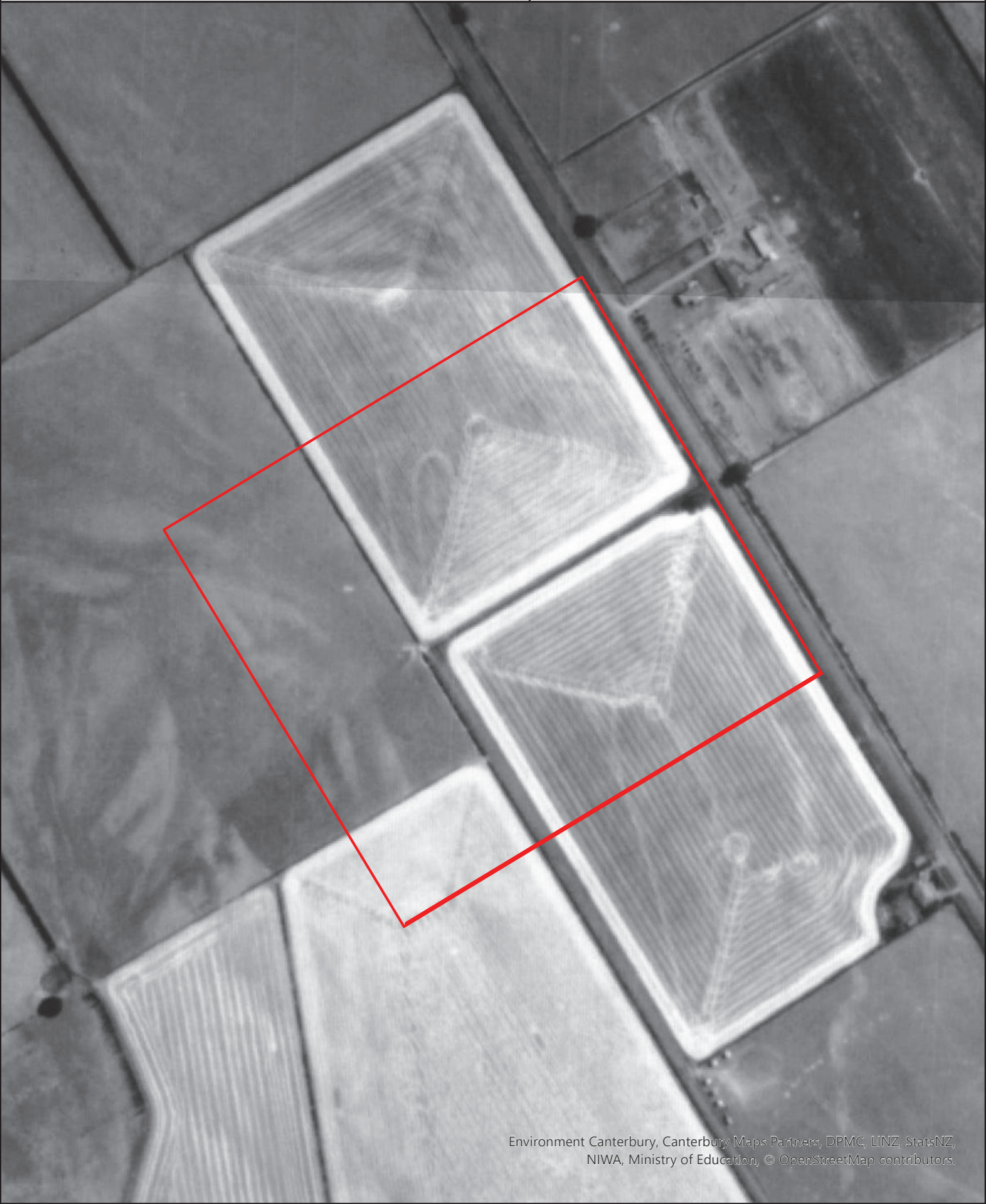
Information has been derived from various organisations, including Environment Canterbury and the Canterbury Maps partners. Boundary information is derived under licence from LINZ Digital Cadastral Database (Crown Copyright Reserved). Environment Canterbury and the Canterbury Maps partners do not give and expressly disclaim any warranty as to the accuracy or completeness of the information or its fitness for any purpose.

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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:31 AM





# 1994 Aerial

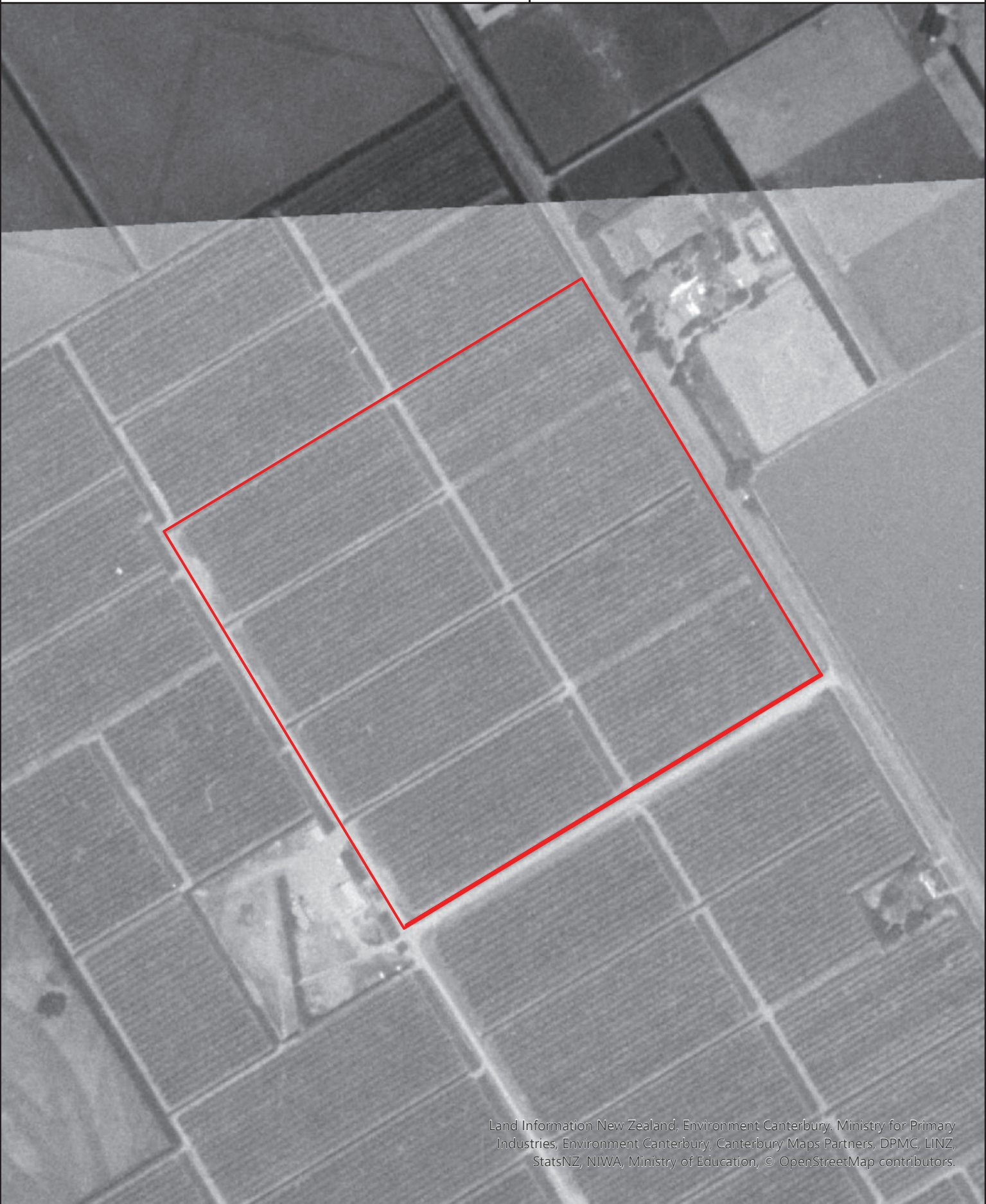
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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:31 AM





# 2000 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:31 AM





# 2005 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:32 AM





# 2012 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:32 AM





# 2016 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 11/09/2024 at 1:02 PM





# 2020 Aerial

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Scale: 1:3,000 @A4

Map Created by MEL on 2/09/2024 at 11:26 AM



## Appendix D – Sample Location Plan



## LEGEND

- SS1 Soil sample location
- SS1 Soil sample location XRF tested only
- BP3 Burn area unable to be XRF tested/sampled
- SS1 Soil sample location that exceeds the 'residential 10% produce' SGV for arsenic
- Green waste piles (likely from pruning trees) where the underlying soils could not be accessed for XRF testing/soil sampling

PLAN MUST BE PRINTED IN COLOUR

### Notes:

- 1 This plan has been prepared for soil contamination risk assessment purposes only. No liability is accepted if the plan is used for any other purposes.
- 2 Any measurements taken from this plan which are not dimensioned on the electronic copy are at the risk of the user.
- 3 Soil sample locations are approximate only



1/487 & 2/487 Weedons Road

Sample Location Plan

Graphic scale is approximate only



Date: 06 September 2024

Drawing No: 895/1

## Appendix E – Table of XRF Results

# Table of XRF Results - 1/487 & 2/487 Weedons Road, Rolleston

Date of testing: 03 & 04 September 2024

Units: ppm



Sample ID (Lab tested in bold)	Sample Depth (mm)	XRF Reading No	Date	Time	Test Duration (secs)	Total Recoverable Arsenic	
						Result	Error
Calibration Test	-	1	3/09/2024	9:47:01	40.0	455	4
Calibration Test	-	2	3/09/2024	9:47:57	40.0	11	1
Blank	-	3	3/09/2024	9:49:06	40.0	<LOD	3
BP1	0	4	3/09/2024	9:54:13	31.2	<LOD	4
BP1	0	5	3/09/2024	9:55:23	40.0	<LOD	4
BP1	0	6	3/09/2024	9:56:36	30.7	2	1
BP2	0	7	3/09/2024	9:58:32	31.1	8	1
BP2	0	8	3/09/2024	9:59:34	30.0	<LOD	2
BP2	0	9	3/09/2024	10:00:49	30.0	2	1
<b>BP4</b>	0	10	3/09/2024	10:22:59	30.0	207	2
BP5	0	11	3/09/2024	10:37:09	30.0	12	1
BP5	0	12	3/09/2024	10:37:46	28.5	5	1
<b>BP5</b>	0	13	3/09/2024	10:38:24	31.1	15	1
Blank	-	14	3/09/2024	10:50:59	40.0	<LOD	3
Mound	0	15	3/09/2024	11:16:49	30.7	5	1
Mound	0	16	3/09/2024	11:17:57	31.1	4	1
Mound	0	17	3/09/2024	11:19:18	30.7	4	1
Mound	0	18	3/09/2024	11:20:52	30.7	<LOD	4
Mound	0	19	3/09/2024	11:22:35	30.0	4	1
BP6	0	20	3/09/2024	11:24:59	40.0	12	0
BP6	0	21	3/09/2024	11:26:17	30.0	2	0
BP6	0	22	3/09/2024	11:27:38	31.1	7	0
BP13	0	23	3/09/2024	12:52:12	30.0	5	1
BP13	0	24	3/09/2024	12:52:48	30.0	4	1
BP13	0	25	3/09/2024	12:53:25	30.0	3	1
BP9	0	26	3/09/2024	12:59:25	30.0	4	1
BP9	0	27	3/09/2024	13:00:01	30.0	4	1
BP9	0	28	3/09/2024	13:00:39	30.0	3	1
Blank	-	29	3/09/2024	13:07:18	40.0	<LOD	4
BP14	0	30	3/09/2024	13:41:33	31.1	5	0
<b>BP14</b>	0	31	3/09/2024	13:42:22	30.0	499	4
BP11	0	32	3/09/2024	14:03:32	30.7	5	1
BP11	0	33	3/09/2024	14:04:09	30.0	3	1
BP11	0	34	3/09/2024	14:04:48	30.0	5	1
<b>BP12</b>	0	35	3/09/2024	14:09:44	32.7	44	1
BP12	0	36	3/09/2024	14:10:24	30.0	14	1
BP12	0	37	3/09/2024	14:11:02	30.0	8	1
BP12	0	38	3/09/2024	14:13:26	31.1	17	1
misfire	-	39	3/09/2024	14:25:02	13.0	<LOD	5

BP8	0	40	3/09/2024	14:25:32	30.0	4	1
BP8	0	41	3/09/2024	14:26:12	30.0	3	1
BP8	0	42	3/09/2024	14:27:16	30.7	4	1
BP15	0	43	3/09/2024	14:29:57	30.0	18	1
<b>BP15</b>	0	44	3/09/2024	14:30:44	22.4	<b>253</b>	2
Blank	-	45	3/09/2024	14:36:39	40.0	<LOD	3
Calibration Test	-	1	4/09/2024	8:55:03	40.0	448	4
Calibration Test	-	2	4/09/2024	8:56:02	40.0	10	1
Blank	-	3	4/09/2024	8:57:11	40.0	<LOD	3
BP7	0	4	4/09/2024	9:09:33	30.7	3	1
BP7	0	5	4/09/2024	9:10:13	30.7	3	1
BP7	0	6	4/09/2024	9:10:56	30.7	3	1
BP10	0	7	4/09/2024	9:15:45	30.0	3	1
BP10	0	8	4/09/2024	9:16:23	30.7	3	1
BP10	0	9	4/09/2024	9:17:06	30.0	4	1
Blank	-	10	4/09/2024	9:24:03	40.0	<LOD	3
Soil Guideline Values	Residential 10% Produce SGV					20	
	Outdoor Worker					70	
	Reference					NES	

Result exceeds 'residential 10% produce' SGV



# Appendix F – Tables of Laboratory Results

# Table of Laboratory Results - 1/487 & 2/487 Weedons Road, Rolleston

Date of sampling: 03 & 04 September 2024



Sample Name:		Soil Guideline Values																			
		SS1.1	SS2.1	SS3.1	SS4.1	SS5.1	SS6.1	SS7.1	DUP 1	SS8.1	SS9.1	SS10.1	SS11.1	RPD	Residential 10% Produce	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background	
Soil Results	Depth:	50	50	50	50	50	50	50	50	50	50	50	50	SS7.1 & DUP1							
	Lab Number:	3664199.1	3664199.3	3664199.5	3664199.7	3664199.9	3664199.11	3664199.13	3664199.69	3664199.15	3664199.17	3664199.19	3664199.21								
Heavy Metals																					
Heavy Metals	Arsenic	mg/kg	4	3	3	4	4	3	3	3	4	5	3	0%	20	70	NES	210	ANZWQ	12.58	
	Cadmium	mg/kg	0.16	0.17	0.17	0.18	0.18	0.19	0.21	0.19	0.15	0.17	0.15	10%	3	1,300	NES	30	ANZWQ	0.19	
	Chromium	mg/kg	16	13	13	13	15	14	13	13	14	13	14	13	0%	460	6,300	NES	1110	ANZWQ	22.70
	Copper	mg/kg	39	26	11	15	22	19	25	24	10	27	21	26	4%	>10,000	>10,000	NES	810	ANZWQ	20.30
	Lead	mg/kg	17.1	14	13.2	12	16.2	19.4	13.6	13.4	13.8	13.8	13.7	1%	210	3,300	NES	660	ANZWQ	40.96	
	Nickel	mg/kg	12	10	10	10	11	9	10	10	10	14	11	11%	400	6,000	NEPM	156	ANZWQ	20.70	
	Zinc	mg/kg	100	80	67	75	81	86	82	83	66	85	81	1%	7,400	400,000	NEPM	1230	ANZWQ	93.94	

Sample Name:		Soil Guideline Values																			
		SS12.1		SS13.1	SS14.1	SS15.1	SS16.1	SS17.1	SS18.1	DUP 2	SS19.1	SS20.1	SS21.1	SS22.1	RPD	Residential 10% Produce	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background
Soil Results	Depth:	50	50	50	50	50	50	50	50	50	50	50	50	50	SS18.1 & DUP2						
	Lab Number:	3664199.23	3664199.25	3664199.27	3664199.29	3664199.31	3664199.33	3664199.35	3664199.7	3664199.37	3664199.39	3664199.41	3664199.43								
Heavy Metals																					
	Arsenic	mg/kg	3	4	3	4	4	4	4	3	4	4	5	0%	20	70	NES	210	ANZWQ	12.58	
	Cadmium	mg/kg	0.15	0.18	0.23	0.21	0.15	0.16	0.16	0.19	0.17	0.15	0.14	0%	3	1,300	NES	30	ANZWQ	0.19	
	Chromium	mg/kg	12	14	14	14	16	14	15	13	14	15	16	2%	460	6,300	NES	1110	ANZWQ	22.70	
	Copper	mg/kg	22	12	25	19	18	13	23	24	23	17	18	20	1%	>10,000	>10,000	NES	810	ANZWQ	20.30
	Lead	mg/kg	13	14.3	15	14.8	16.2	16.7	15.6	16.1	13.1	16.6	17.2	18	1%	210	3,300	NES	660	ANZWQ	40.96
	Nickel	mg/kg	9	10	10	10	11	11	11	9	10	12	12	0%	400	6,000	NEPM	156	ANZWQ	20.70	
	Zinc	mg/kg	73	66	86	82	72	84	87	88	75	83	87	1%	7,400	400,000	NEPM	1230	ANZWQ	93.94	

Sample Name:		Soil Guideline Values																		
		SS23.1	SS24.1	SS25.1	SS25.2	SS26.1	SS27.1	SS27.2	BP4.1	BP5.1	BP6.1	BP12.1	BP14.1	BP15.1	Residential 10% Produce	Commercial/ Outdoor Worker	Reference	Ecological Receptors	Reference	Background
Soil Results	Depth:	50	50	50	250	50	50	250	0-50	0-50	0-50	0-50	0-50	0-50	0-50					
	Lab Number:	3664199.45	3664199.47	3664199.49	3664199.50	3664199.51	3664199.53	3664199.53	3664199.57	3664199.58	3664199.59	3664199.65	3664199.67	3664199.68						
Heavy Metals																				
	Arsenic	mg/kg	5	4	25	8	24	10	360	22	18	28	1120	880	20	70	NES	210	ANZWQ	12.58
	Cadmium	mg/kg	0.16	< 0.10	0.61	0.24	0.17	0.17	0.6	0.26	0.27	0.17	0.82	0.23	3	1,300	NES	30	ANZWQ	0.19
	Chromium	mg/kg	16	14	25	15	22	17	198	26	18	22	430	420	460	6,300	NES	1110	ANZWQ	22.70
	Copper	mg/kg	21	6	44	18	35	23	330	53	36	45	780	580	>10,000	>10,000	NES	810	ANZWQ	20.30
	Lead	mg/kg	17.5	16	19.2	15.5	16	17.7	17	17	13.4	17.7	250	16.3	210	3,300	NES	660	ANZWQ	40.96
	Nickel	mg/kg	11	9	11	11	11	11	11	11	11	12	11	10	400	6,000	NEPM	156	ANZWQ	20.70
	Zinc	mg/kg	86	52	159	88	144	110	850	200	177	97	1120	240	7,400	400,000	NEPM	1230	ANZWQ	93.94

Indicates result exceeds Residential 10% Produce' SGV

Indicates result exceeds Ecological Guideline Values

Indicates result exceeds Background

## References:

- NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MfE
- NEPM - National Environmental Protection Measures 2013, Australia
- ANZWQ - Australian and New Zealand - Guidelines for Fresh and Marine Water Quality (online) - 3 x Sediment GV-high
- , Concentrations for 'Regional, Recent' soil group from Background concentrations in Canterbury soils, Tonkin and Taylor, July 2007

# Table of Laboratory Results - 1/487 & 2/487 Weedons Road, Rolleston

Date of sampling: 03 & 04 September 2024



Sample Name:		Composite of SS1.1, SS2.1, SS5.1 & SS6.1		Composite of SS3.1, SS4.1, SS7.1 & SS8.1		Composite of SS9.1, SS10.1 & SS13.1		Composite of SS11.1, SS12.1, SS14.1 & SS15.1		Soil Guideline Values			
		50	3664199.71	50	3664199.72	50	3664199.73	50	3664199.74	Residential 10% Produce	Commercial/ Outdoor Worker	Reference	Background <sub>2</sub>
<b>Soil Results</b>		Depth	Lab number										
<b>Organochlorine Pesticides (OCPs) in soil</b>													
2,4'-DDD	mg/kg dry wt	< 0.013		< 0.012		< 0.014		< 0.013		-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013		< 0.012		< 0.014		< 0.013		-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013		< 0.012		< 0.014		< 0.013		-	-	-	-
4,4'-DDD	mg/kg dry wt	0.034		0.05		0.052		0.034		-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013		< 0.012		< 0.014		< 0.013		-	-	-	-
4,4'-DDT	mg/kg dry wt	< 0.013		< 0.012		< 0.014		< 0.013		-	-	-	-
Total DDT	mg/kg dry wt	< 0.08		< 0.07		< 0.08		< 0.08		70	1,000	NES	0.43 <sub>2</sub>
All other analytes in the OCP suite were below the laboratory limit of detection													

Sample Name:		Composite of SS16.1, SS17.1, SS20.1 & SS21.1		Composite of SS18.1, SS19.1, SS24.1 & SS25.1		Composite of SS22.1, SS23.1, SS26.1 & SS27.1		Composite of SS10.1, SS13.1 & SS24.1		Soil Guideline Values			
		50	3664199.75	50	3664199.76	50	3664199.77	50	3664199.78	Residential 10% Produce	Commercial/ Outdoor Worker	Reference	Background <sub>2</sub>
<b>Soil Results</b>		Depth	Lab number										
<b>Organochlorine Pesticides (OCPs) in soil</b>													
2,4'-DDD	mg/kg dry wt	< 0.013		< 0.013		< 0.013		-		-	-	-	-
2,4'-DDE	mg/kg dry wt	< 0.013		< 0.013		< 0.013		-		-	-	-	-
2,4'-DDT	mg/kg dry wt	< 0.013		< 0.013		< 0.013		-		-	-	-	-
4,4'-DDD	mg/kg dry wt	0.044		0.033		0.023		-		-	-	-	-
4,4'-DDE	mg/kg dry wt	< 0.013		< 0.013		< 0.013		-		-	-	-	-
4,4'-DDT	mg/kg dry wt	0.017		0.014		< 0.013		-		-	-	-	-
Total DDT	mg/kg dry wt	< 0.08		< 0.08		< 0.08		-		70	1,000	NES	0.43 <sub>2</sub>
All other analytes in the OCP suite were below the laboratory limit of detection													
<b>Organonitro&amp;Phosphorus Pesticides in Soil</b>													
Terbutylazine	mg/kg dry wt	-		-		-		0.04		-	-	-	-
All other analytes in the ONOP suite were below the laboratory limit of detection													

**Indicates result exceeds 'Residential 10% Produce' SGV**

Indicates result exceeds Ecological Guideline Values

Indicates result exceeds Background

## Notes:

This table does not represent the full analytical results, please refer to the laboratory reports for full details.

## References:

NES - National Environmental Standard for Assessing and Managing Contaminants in Soils, MFE

<sub>2</sub> Concentrations for 'Christchurch Metropolitan' soils from Ambient Concentrations of selected organochlorine in soils, Buckland, Ellis and Salter 1998

## Appendix G – Laboratory Reports



## Certificate of Analysis

Page 1 of 6

<b>Client:</b>	Momentum Environmental Limited	<b>Lab No:</b>	3664199	SPv2
<b>Contact:</b>	Nicola Peacock	<b>Date Received:</b>	04-Sep-2024	
	C/- Momentum Environmental Limited	<b>Date Reported:</b>	17-Sep-2024	(Amended)
	19 Robertsons Road	<b>Quote No:</b>	72157	
	Kirwee 7671	<b>Order No:</b>		
		<b>Client Reference:</b>	895-1&2/487 Weedons Rd	
		<b>Submitted By:</b>	Fran Hobkirk	

### Sample Type: Soil

Sample Name:	SS1.1 03-Sep-2024 9:54 am	SS2.1 03-Sep-2024 10:06 am	SS3.1 03-Sep-2024 10:16 am	SS4.1 03-Sep-2024 10:20 am	SS5.1 03-Sep-2024 10:34 am
Lab Number:	3664199.1	3664199.3	3664199.5	3664199.7	3664199.9

#### Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	4	3	3	3	4
Total Recoverable Cadmium	mg/kg dry wt	0.16	0.17	0.17	0.19	0.18
Total Recoverable Chromium	mg/kg dry wt	16	13	13	13	15
Total Recoverable Copper	mg/kg dry wt	39	26	11	15	22
Total Recoverable Lead	mg/kg dry wt	17.1	14.0	13.2	12.3	16.2
Total Recoverable Nickel	mg/kg dry wt	12	10	10	10	11
Total Recoverable Zinc	mg/kg dry wt	100	80	67	75	81

Sample Name:	SS6.1 03-Sep-2024 10:39 am	SS7.1 03-Sep-2024 10:57 am	SS8.1 03-Sep-2024 11:02 am	SS9.1 03-Sep-2024 11:00 am	SS10.1 03-Sep-2024 11:25 am
Lab Number:	3664199.11	3664199.13	3664199.15	3664199.17	3664199.19

#### Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	4	3	3	4	5
Total Recoverable Cadmium	mg/kg dry wt	0.18	0.19	0.19	0.15	0.17
Total Recoverable Chromium	mg/kg dry wt	14	13	14	13	14
Total Recoverable Copper	mg/kg dry wt	19	25	10	27	21
Total Recoverable Lead	mg/kg dry wt	19.4	13.6	13.8	15.3	13.8
Total Recoverable Nickel	mg/kg dry wt	11	9	10	9	14
Total Recoverable Zinc	mg/kg dry wt	86	82	66	85	73

Sample Name:	SS11.1 03-Sep-2024 11:50 am	SS12.1 03-Sep-2024 11:52 am	SS13.1 03-Sep-2024 11:31 am	SS14.1 03-Sep-2024 11:55 am	SS15.1 03-Sep-2024 12:00 pm
Lab Number:	3664199.21	3664199.23	3664199.25	3664199.27	3664199.29

#### Heavy Metals, Screen Level

Total Recoverable Arsenic	mg/kg dry wt	3	3	4	3	4
Total Recoverable Cadmium	mg/kg dry wt	0.15	0.15	0.18	0.23	0.21
Total Recoverable Chromium	mg/kg dry wt	13	12	14	14	14
Total Recoverable Copper	mg/kg dry wt	26	22	12	25	19
Total Recoverable Lead	mg/kg dry wt	13.7	12.5	14.3	15.2	14.8
Total Recoverable Nickel	mg/kg dry wt	11	9	10	10	10
Total Recoverable Zinc	mg/kg dry wt	81	73	66	86	82



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:		SS16.1 03-Sep-2024 1:17 pm	SS17.1 03-Sep-2024 1:22 pm	SS18.1 03-Sep-2024 1:22 pm	SS19.1 03-Sep-2024 1:28 pm	SS20.1 03-Sep-2024 1:42 pm
Lab Number:		3664199.31	3664199.33	3664199.35	3664199.37	3664199.39
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	4	4	3	4
Total Recoverable Cadmium	mg/kg dry wt	0.15	0.15	0.16	0.19	0.17
Total Recoverable Chromium	mg/kg dry wt	16	16	14	13	14
Total Recoverable Copper	mg/kg dry wt	18	13	23	23	17
Total Recoverable Lead	mg/kg dry wt	16.2	16.7	15.6	13.1	16.6
Total Recoverable Nickel	mg/kg dry wt	11	12	11	9	10
Total Recoverable Zinc	mg/kg dry wt	82	72	84	88	75

Sample Name:		SS21.1 03-Sep-2024 1:46 pm	SS22.1 03-Sep-2024 12:43 pm	SS23.1 03-Sep-2024 12:38 pm	SS24.1 03-Sep-2024 2:07 pm	SS25.1 03-Sep-2024 1:55 pm
Lab Number:		3664199.41	3664199.43	3664199.45	3664199.47	3664199.49
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	5	5	4	25
Total Recoverable Cadmium	mg/kg dry wt	0.15	0.14	0.16	< 0.10	0.61
Total Recoverable Chromium	mg/kg dry wt	15	16	16	14	25
Total Recoverable Copper	mg/kg dry wt	18	20	21	6	44
Total Recoverable Lead	mg/kg dry wt	17.2	18.4	17.5	16.2	19.2
Total Recoverable Nickel	mg/kg dry wt	12	12	11	9	11
Total Recoverable Zinc	mg/kg dry wt	83	87	86	52	159

Sample Name:		SS25.2 03-Sep-2024 1:58 pm	SS26.1 03-Sep-2024 12:57 pm	SS27.1 03-Sep-2024 1:01 pm	SS27.2 03-Sep-2024 1:03 pm	BP4.1 03-Sep-2024 10:28 am
Lab Number:		3664199.50	3664199.51	3664199.53	3664199.54	3664199.57
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	8	5	24	10	360
Total Recoverable Cadmium	mg/kg dry wt	0.24	0.19	0.17	0.17	0.6
Total Recoverable Chromium	mg/kg dry wt	15	17	22	17	198
Total Recoverable Copper	mg/kg dry wt	18	23	35	23	330
Total Recoverable Lead	mg/kg dry wt	15.5	19.8	16.0	17.7	17.0
Total Recoverable Nickel	mg/kg dry wt	11	14	11	11	11
Total Recoverable Zinc	mg/kg dry wt	88	98	144	110	850

Sample Name:		BP5.1 03-Sep-2024 10:44 am	BP6.1 03-Sep-2024 11:33 am	BP12.1 03-Sep-2024 2:16 pm	BP14.1 03-Sep-2024 1:47 pm	BP15.1 03-Sep-2024 2:35 pm
Lab Number:		3664199.58	3664199.59	3664199.65	3664199.67	3664199.68
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	22	18	28	1,120	880
Total Recoverable Cadmium	mg/kg dry wt	0.26	0.27	0.17	0.82	0.23
Total Recoverable Chromium	mg/kg dry wt	26	18	22	430	420
Total Recoverable Copper	mg/kg dry wt	53	36	45	780	580
Total Recoverable Lead	mg/kg dry wt	17.0	13.4	17.7	250	16.3
Total Recoverable Nickel	mg/kg dry wt	11	11	12	11	10
Total Recoverable Zinc	mg/kg dry wt	200	177	97	1,120	240

Sample Name:		DUP 1 03-Sep-2024 10:57 am	DUP 2 03-Sep-2024 1:23 pm	Composite of SS1.1, SS2.1, SS5.1 & SS6.1	Composite of SS3.1, SS4.1, SS7.1 & SS8.1	Composite of SS9.1, SS10.1 & SS13.1
Lab Number:		3664199.69	3664199.70	3664199.71	3664199.72	3664199.73
Individual Tests						
Dry Matter	g/100g as rcvd	-	-	80	83	73
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	4	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.21	0.16	-	-	-
Total Recoverable Chromium	mg/kg dry wt	13	15	-	-	-
Total Recoverable Copper	mg/kg dry wt	24	24	-	-	-
Total Recoverable Lead	mg/kg dry wt	13.4	16.1	-	-	-

Sample Type: Soil						
Sample Name:		DUP 1 03-Sep-2024 10:57 am	DUP 2 03-Sep-2024 1:23 pm	Composite of SS1.1, SS2.1, SS5.1 & SS6.1	Composite of SS3.1, SS4.1, SS7.1 & SS8.1	Composite of SS9.1, SS10.1 & SS13.1
Lab Number:		3664199.69	3664199.70	3664199.71	3664199.72	3664199.73
Heavy Metals, Screen Level						
Total Recoverable Nickel	mg/kg dry wt	10	11	-	-	-
Total Recoverable Zinc	mg/kg dry wt	83	87	-	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
alpha-BHC	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
beta-BHC	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
delta-BHC	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
gamma-BHC (Lindane)	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
cis-Chlordane	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
trans-Chlordane	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
2,4'-DDD	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
4,4'-DDD	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
2,4'-DDE	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
4,4'-DDE	mg/kg dry wt	-	-	0.034	0.050	0.052
2,4'-DDT	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
4,4'-DDT	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Total DDT Isomers	mg/kg dry wt	-	-	< 0.08	< 0.07	< 0.08
Dieldrin	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Endosulfan I	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Endosulfan II	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Endosulfan sulphate	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Endrin	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Endrin aldehyde	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Endrin ketone	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Heptachlor	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Heptachlor epoxide	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Hexachlorobenzene	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014
Methoxychlor	mg/kg dry wt	-	-	< 0.013	< 0.012	< 0.014

Sample Name:		Composite of SS11.1, SS12.1, SS14.1 & SS15.1	Composite of SS16.1, SS17.1, SS20.1 & SS21.1	Composite of SS18.1, SS19.1, SS24.1 & SS25.1	Composite of SS22.1, SS23.1, SS26.1 & SS27.1	Composite of SS10.1, SS13.1 & SS24.1
Lab Number:		3664199.74	3664199.75	3664199.76	3664199.77	3664199.78
Individual Tests						
Dry Matter	g/100g as rcvd	81	80	80	79	82
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
alpha-BHC	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
beta-BHC	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
delta-BHC	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
cis-Chlordane	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
trans-Chlordane	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
2,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
4,4'-DDD	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
2,4'-DDE	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
4,4'-DDE	mg/kg dry wt	0.034	0.044	0.033	0.023	-
2,4'-DDT	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
4,4'-DDT	mg/kg dry wt	< 0.013	0.017	0.014	< 0.013	-
Total DDT Isomers	mg/kg dry wt	< 0.08	< 0.08	< 0.08	< 0.08	-
Dieldrin	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Endosulfan I	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Endosulfan II	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Endosulfan sulphate	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Endrin	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-

Sample Type: Soil						
Sample Name:		Composite of SS11.1, SS12.1, SS14.1 & SS15.1	Composite of SS16.1, SS17.1, SS20.1 & SS21.1	Composite of SS18.1, SS19.1, SS24.1 & SS25.1	Composite of SS22.1, SS23.1, SS26.1 & SS27.1	Composite of SS10.1, SS13.1 & SS24.1
Lab Number:		3664199.74	3664199.75	3664199.76	3664199.77	3664199.78
Organochlorine Pesticides Screening in Soil						
Endrin aldehyde	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Endrin ketone	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Heptachlor	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Heptachlor epoxide	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Hexachlorobenzene	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Methoxychlor	mg/kg dry wt	< 0.013	< 0.013	< 0.013	< 0.013	-
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Acetochlor	mg/kg dry wt	-	-	-	-	< 0.07
Alachlor	mg/kg dry wt	-	-	-	-	< 0.05
Atrazine	mg/kg dry wt	-	-	-	-	< 0.07
Atrazine-desethyl	mg/kg dry wt	-	-	-	-	< 0.07
Atrazine-desisopropyl	mg/kg dry wt	-	-	-	-	< 0.13
Azaconazole	mg/kg dry wt	-	-	-	-	< 0.04
Azinphos-methyl	mg/kg dry wt	-	-	-	-	< 0.13
Benalaxyl	mg/kg dry wt	-	-	-	-	< 0.04
Bitertanol	mg/kg dry wt	-	-	-	-	< 0.13
Bromacil	mg/kg dry wt	-	-	-	-	< 0.07
Bromopropylate	mg/kg dry wt	-	-	-	-	< 0.07
Butachlor	mg/kg dry wt	-	-	-	-	< 0.07
Captan	mg/kg dry wt	-	-	-	-	< 0.13
Carbaryl	mg/kg dry wt	-	-	-	-	< 0.07
Carbofuran	mg/kg dry wt	-	-	-	-	< 0.07
Chlorfluazuron	mg/kg dry wt	-	-	-	-	< 0.07
Chlorothalonil	mg/kg dry wt	-	-	-	-	< 0.07
Chlorpyrifos	mg/kg dry wt	-	-	-	-	< 0.07
Chlorpyrifos-methyl	mg/kg dry wt	-	-	-	-	< 0.07
Chlortoluron	mg/kg dry wt	-	-	-	-	< 0.13
Cyanazine	mg/kg dry wt	-	-	-	-	< 0.07
Cyfluthrin	mg/kg dry wt	-	-	-	-	< 0.08
Cyhalothrin	mg/kg dry wt	-	-	-	-	< 0.07
Cypermethrin	mg/kg dry wt	-	-	-	-	< 0.16
Deltamethrin (including Tralomethrin)	mg/kg dry wt	-	-	-	-	< 0.07
Diazinon	mg/kg dry wt	-	-	-	-	< 0.04
Dichlofluanid	mg/kg dry wt	-	-	-	-	< 0.07
Dichloran	mg/kg dry wt	-	-	-	-	< 0.2
Dichlorvos	mg/kg dry wt	-	-	-	-	< 0.09
Difenoconazole	mg/kg dry wt	-	-	-	-	< 0.10
Dimethoate	mg/kg dry wt	-	-	-	-	< 0.13
Diphenylamine	mg/kg dry wt	-	-	-	-	< 0.13
Diuron	mg/kg dry wt	-	-	-	-	< 0.07
Fenpropimorph	mg/kg dry wt	-	-	-	-	< 0.07
Fluazifop-butyl	mg/kg dry wt	-	-	-	-	< 0.07
Fluometuron	mg/kg dry wt	-	-	-	-	< 0.07
Flusilazole	mg/kg dry wt	-	-	-	-	< 0.07
Fluvalinate	mg/kg dry wt	-	-	-	-	< 0.05
Furalaxyl	mg/kg dry wt	-	-	-	-	< 0.04
Haloxifop-methyl	mg/kg dry wt	-	-	-	-	< 0.07
Hexaconazole	mg/kg dry wt	-	-	-	-	< 0.07
Hexazinone	mg/kg dry wt	-	-	-	-	< 0.04
IPBC (3-Iodo-2-propynyl-n- butylcarbamate)	mg/kg dry wt	-	-	-	-	< 0.4
Kresoxim-methyl	mg/kg dry wt	-	-	-	-	< 0.04
Linuron	mg/kg dry wt	-	-	-	-	< 0.4
Malathion	mg/kg dry wt	-	-	-	-	< 0.07



Sample Type: Soil						
Sample Name:		Composite of SS11.1, SS12.1, SS14.1 & SS15.1	Composite of SS16.1, SS17.1, SS20.1 & SS21.1	Composite of SS18.1, SS19.1, SS24.1 & SS25.1	Composite of SS22.1, SS23.1, SS26.1 & SS27.1	Composite of SS10.1, SS13.1 & SS24.1
Lab Number:		3664199.74	3664199.75	3664199.76	3664199.77	3664199.78
Organonitro&phosphorus Pesticides Screen in Soil by GCMS						
Metalaxyl	mg/kg dry wt	-	-	-	-	< 0.07
Methamidophos	mg/kg dry wt	-	-	-	-	< 0.4
Metolachlor	mg/kg dry wt	-	-	-	-	< 0.05
Metribuzin	mg/kg dry wt	-	-	-	-	< 0.07
Molinate	mg/kg dry wt	-	-	-	-	< 0.13
Myclobutanil	mg/kg dry wt	-	-	-	-	< 0.07
Naled	mg/kg dry wt	-	-	-	-	< 0.4
Norflurazon	mg/kg dry wt	-	-	-	-	< 0.13
Oxadiazon	mg/kg dry wt	-	-	-	-	< 0.07
Oxyfluorfen	mg/kg dry wt	-	-	-	-	< 0.04
Paclobutrazol	mg/kg dry wt	-	-	-	-	< 0.07
Parathion-ethyl	mg/kg dry wt	-	-	-	-	< 0.07
Parathion-methyl	mg/kg dry wt	-	-	-	-	< 0.07
Pendimethalin	mg/kg dry wt	-	-	-	-	< 0.07
Permethrin	mg/kg dry wt	-	-	-	-	< 0.03
Pirimicarb	mg/kg dry wt	-	-	-	-	< 0.07
Pirimiphos-methyl	mg/kg dry wt	-	-	-	-	< 0.07
Prochloraz	mg/kg dry wt	-	-	-	-	< 0.4
Procymidone	mg/kg dry wt	-	-	-	-	< 0.07
Prometryn	mg/kg dry wt	-	-	-	-	< 0.04
Propachlor	mg/kg dry wt	-	-	-	-	< 0.07
Propanil	mg/kg dry wt	-	-	-	-	< 0.2
Propazine	mg/kg dry wt	-	-	-	-	< 0.04
Propiconazole	mg/kg dry wt	-	-	-	-	< 0.05
Pyriproxyfen	mg/kg dry wt	-	-	-	-	< 0.07
Quizalofop-ethyl	mg/kg dry wt	-	-	-	-	< 0.07
Simazine	mg/kg dry wt	-	-	-	-	< 0.07
Simetryn	mg/kg dry wt	-	-	-	-	< 0.07
Sulfentrazone	mg/kg dry wt	-	-	-	-	< 0.4
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	-	-	-	-	< 0.13
Tebuconazole	mg/kg dry wt	-	-	-	-	< 0.07
Terbacil	mg/kg dry wt	-	-	-	-	< 0.07
Terbumeton	mg/kg dry wt	-	-	-	-	< 0.07
Terbutylazine	mg/kg dry wt	-	-	-	-	0.04
Terbutylazine-desethyl	mg/kg dry wt	-	-	-	-	< 0.07
Terbutryn	mg/kg dry wt	-	-	-	-	< 0.07
Thiabendazole	mg/kg dry wt	-	-	-	-	< 0.4
Thiobencarb	mg/kg dry wt	-	-	-	-	< 0.07
Tolylfluanid	mg/kg dry wt	-	-	-	-	< 0.04
Triazophos	mg/kg dry wt	-	-	-	-	< 0.07
Trifluralin	mg/kg dry wt	-	-	-	-	< 0.07
Vinclozolin	mg/kg dry wt	-	-	-	-	< 0.07

### Analyst's Comments

**Amended Report:** This certificate of analysis replaces report '3664199-SPv1' issued on 10-Sep-2024 at 1:32 pm.  
Reason for amendment: At the client's request, testing has been added.

## 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 Labs, 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%. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed).	-	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49-51, 53-54, 57-59, 65, 67-70
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	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49-51, 53-54, 57-59, 65, 67-70
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	71-77
Organonitro&phosphorus Pesticides Screen in Soil by GCMS	Sonication extraction, GC-MS analysis. Tested on as received sample. In-house based on US EPA 8270.	0.02 - 0.2 mg/kg dry wt	78
Dry Matter	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	71-78
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53

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

Testing was completed between 04-Sep-2024 and 17-Sep-2024. 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.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)  
Client Services Manager - Environmental