



## **Appendix C**

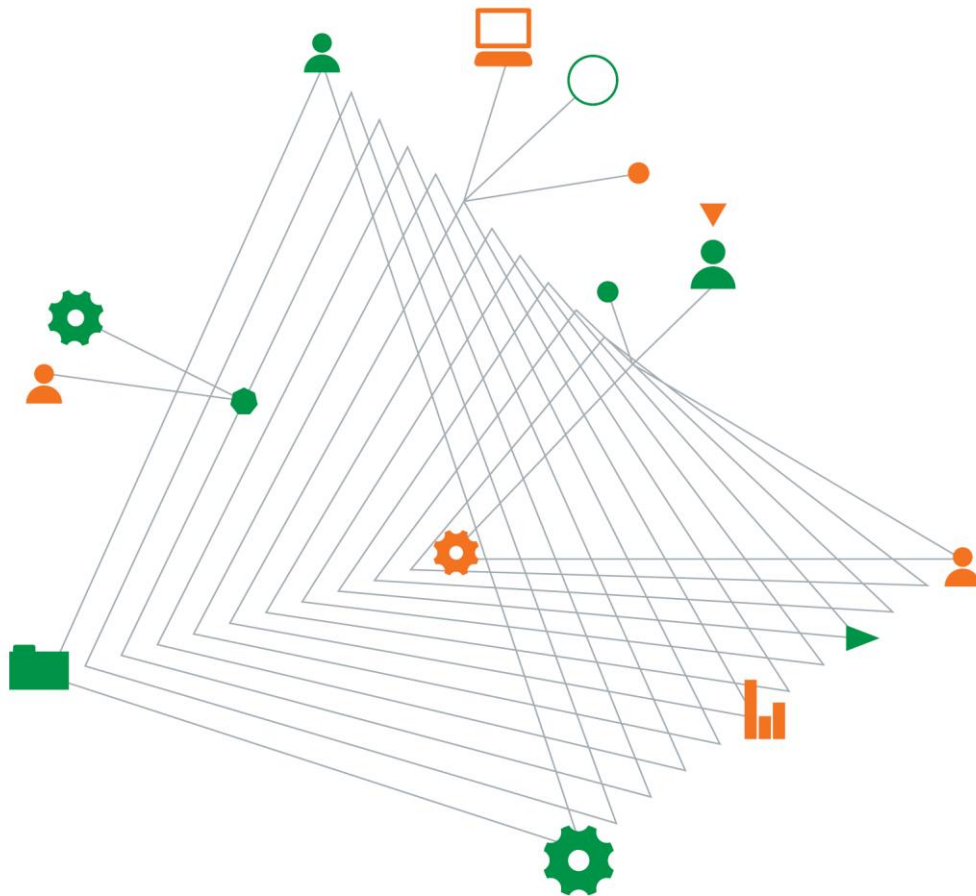
### **Preliminary Site Investigation (PSI) Report**

## **Rolleston Industrial Developments Limited**

### **Preliminary Site Investigation**

1491 Springs Road, Lincoln

19 October 2020



Experience  
comes to life  
when it is  
powered by  
expertise

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# Preliminary Site Investigation - 1491 Springs Road, Lincoln

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19 October 2020

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## Quality information

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# **1. Introduction**

Coffey Services (NZ) Limited (Coffey) has been commissioned by Rolleston Industrial Developments Ltd ('the client') to conduct a Preliminary Site Investigation (PSI) to support the proposed Plan Change and future subdivision for the property located at 1491 Springs Road, Lincoln (the "site", Figure 1).

The proposed Plan Change area comprises a series of land parcels located to the south of Lincoln, bordering the existing Te Whariki and Verdecos Park subdivisions.

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) (NESCS) Regulations apply to selected activities on sites where an activity or industry on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) is, has, or is more likely than not to have occurred. The objective of this PSI was to assess the potential for contaminants to have been deposited at the site as a result of current and/or historical activities undertaken within or in the immediate vicinity of the site and accordingly determine if any further investigation work is required under the NES.

This PSI report has been reviewed by a Suitably Qualified and Experienced Practitioner (SQEP), as required by the NES.

## **1.1. Objectives**

The objectives of this PSI were to:

- Identify potentially contaminating (HAIL) activities or potential sources of contamination that might have occurred or exist at the site.
- Confirm the suitability of the land for subdivision and provide recommendations regarding additional works required prior to any future development.

## **1.2. Scope of works**

The scope of work was undertaken in general accordance with the staged process defined by the Ministry for Environment (MfE) Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils (revised 2011) and the findings are presented in accordance with the MfE Contaminated Land Management Guideline No.1: Reporting on Contaminated Sites in New Zealand (revised 2011). Both the above documents are incorporated by reference into the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES).

In summary, the following scope of works was undertaken:

- Review of Environment Canterbury's Listed Land-Use Register (LLUR) for the site.
- Review of published geological maps and the Coffey database to appraise likely soil and groundwater conditions at the site.
- Review of selected publicly available aerial photographs or other accessible historical photographs.
- Site walkover, focussed on areas with structures or visible land disturbance to consider land contamination indicators (e.g. visual evidence of waste dumping/material spills, chemical storage and/or usage areas, anomalous die-back in vegetation, ground staining).

- Preparation of this PSI report. As required by the NESCS, this report was reviewed and approved by a suitably qualified and experienced practitioner (SQEP).

## 2. Site information

### 2.1. Site description

The site is located approximately 2.5 km south-west of the central Lincoln township and approximately 20 km south-west of Christchurch's central business district.

The site is bordered by agricultural land-use in all directions with a stream running along the eastern boundary of the site. The site is irregular in shape with predominately flat topography. The details of the site are listed in Table 1.

Table 1: Site information

Address	Legal Description	Property Area (m <sup>2</sup> )
1491 Springs Road, Lincoln	LOT 2 DP 494430 PT LOT 1 16247 LOTS 1-2 DP 5095 PT LOTS 1-3 DP 4157 LOT 8 DP 686 31 RS 38994 40021 PT RS 2951 PT RS 5844 PT RS 2456 PT RS 2933 BLK VIII LEESTON S D	1,781,300

### 2.2. Geology and hydrogeology

The geological map indicates that surface geology consists of OIS1 (Holocene) river deposits which is primarily described as modern river floodplain/low-level degradation tce. Unweathered, variably sorted gravel/sand/silt/clay surfaces <2 degree slope.

The nearest surface water body to the site is the L II River located on the eastern boundary of the site. This river flows in a general southerly direction eventually feeding into Lake Ellesmere approximately 10 km south of the site.

For further information, refer to Coffey's Geotechnical Assessment Report produced in October 2020.

### 2.3. Site history

The following sections summarise the historical activities undertaken within or in the immediate vicinity of the site, as determined from the information sources reviewed during this PSI.

#### 2.3.1. Listed land-use register

Environment Canterbury's LLUR was accessed on 9 October 2020 and noted that the site contained two HAIL activities identified as more likely than not to have occurred within the site. These HAIL activities are labelled as category G3 (landfill sites) and category G5 (waste disposal to land).

Three investigations were recorded within the Council records for the site, two preliminary site investigations in 2009 and 2011 as well as a detailed site investigation in 2011. These investigation reports were not made available during this PSI, however, due to the date of these investigations

being prior to the current NES regulations coming into effect in 2012, these reports are not considered suitable for use as supporting documentation for any resource consent applications.

### **2.3.2. Historical aerial photographs**

Historical aerial photographs of the site and the surrounding area taken between 1942 and 2017 were sourced from the Local Government Geospatial Alliance's (LGGA) Retrolens and the Canterbury Maps Viewer. A summary of observations made from the review of these photographs is provided below. Copies of aerial photographs reviewed are included in Appendix A.

The site was in use as potential grazing or agricultural land from the initial 1942 historical aerial image with a single residential structure in the northern section of the site. The site has remained in use as agricultural land through all of the historical aerial images reviewed to present day.

The aerial imagery indicated that the site appears to have been used for agricultural purposes since before 1943 and may be impacted by HAIL category A10 (persistent pesticide bulk storage or use).

### **2.3.3. Site walkover**

Coffey staff conducted a site walkover of the site on 9 October 2020. Photographs taken during the walkover are included in Appendix B.

Large sections of the site contained grassed areas and no areas of die-off or staining were noted during this walkover. A pit was located covered by hardfill aggregates and some burnt tree material. A series of structures containing general farm storage and equipment were located within the eastern section of the site as well as an above ground fuel storage tank.

An area of excavation can be seen in the central-northern off-site area. These works are not expected to have impacted on the site.

A conversation held with the previous site owner noted a borrow pit within the western section of the site, which it is understood has already had environmental reporting completed for it. This reporting was not available at the time of this investigation. The site owner also noted an offal pit / farm dump in the centre of the western area of the site. On-site observations confirmed the location of the offal pit / farm dump.

## **3. Summary**

Coffey was contracted by the client to conduct a PSI for the property at 1491 Springs Road (the 'site', Figure 1). This investigation has been undertaken to confirm the suitability of the site for subdivision.

Coffey completed a review of Environment Canterbury's LLUR, published geological maps, publicly available historical aerial photographs and completed a site walkover of the site and interview with the previous owner on the 9 October 2020.

On the basis of the information reviewed and collected, Coffey has identified a number of actual or potential HAIL activities to have occurred on-site as summarised in Table 2: Identified potential contamination source areas are shown on Figure 1.



Table 2: Identified actual or potential HAIL activities

Actual/Potential HAIL Activities	Land Use	Information Source	Considered Risk Potential for Contamination to Surrounding Environment
Persistent pesticide bulk storage or use (HAIL Category A10)	Use of pesticide and other agrochemicals in agricultural activities	Site walkover observations, historical aerial photographs.	The risk potential to the underlying soil and groundwater is considered <b>moderate</b> due to: <ul style="list-style-type: none"> <li>Relatively long period of use (since prior to 1943).</li> <li>Likely use of non-environmentally persistent chemicals in the paddocks.</li> <li>Potential down-gradient groundwater users.</li> </ul>
	Storage of farm related chemicals	Site walkover observations	The considered risk potential to the underlying soil and groundwater is considered <b>low</b> due to: <ul style="list-style-type: none"> <li>Presence of concrete floors preventing any spilt/leaked chemical contacting with soil/water.</li> <li>No evidence of spills or staining on floor.</li> </ul>
Storage tanks or drums for fuel, chemicals or liquid waste (HAIL Category A17)	Bulk petrol storage	Site walkover observations	The risk potential to the underlying soil and groundwater is considered <b>moderate</b> due to: <ul style="list-style-type: none"> <li>Evidence of spills or staining on surrounding ground.</li> </ul>
Landfill sites (HAIL Category G3)	Land filling activities	Environment Canterbury's LLUR	The risk potential to the underlying soil and groundwater is considered <b>low</b> due to: <ul style="list-style-type: none"> <li>No visible presence of large earthmoving in historical aerial photographs.</li> </ul>
Waste disposal to land (HAIL Category G5)	Farm dump / offal pit	Environment Canterbury's LLUR, site walkover observations	The risk potential to the underlying soil and groundwater is considered <b>high</b> due to: <ul style="list-style-type: none"> <li>Known offal pit / farm dump.</li> <li>Contents of the pit are unknown.</li> </ul>

The site walkover and review of site history information indicates the following key potential receptors that may be relevant to the site:

- Earthworks contractors who may come into contact with potentially contaminated soil during any proposed future development works.

- Future occupiers of the properties within the site.
- Ecosystems associated with springs and other water bodies within the boundaries of the site and immediately off-site to the east.

## 4. Recommendations

Due to the presence of HAIL activities on the site, the NESCS regulations are considered to apply to the site. Subdividing or changing land use is a permitted activity under section 8(4)(b) of the NESCS if the report on the site states that it is highly unlikely that there will be a risk to human health if the activity is done to the piece of land.

The potential of contamination to soil and waterways associated with the identified potential sources of contamination are considered low to high (refer to Table 2 above), depending on the activity identified. However, it is considered unlikely that there will be a risk to human health with the proposed plan change and subdivision providing that the potential contaminant source areas listed in Table 2 are assessed and remediated (if appropriate) and waste material and soils impacted by the presence of the offal pit / farm dump be removed during any future redevelopment works within the site.

The site is considered to be suitable for plan change and subdivision, with any consent granted for the site, conditional on a detailed site investigation (DSI) and / or remediation works (i.e. remediation and validation of farm dumps / offal pits) being carried out prior to any earthworks and or building consents being granted.

Coffey recommends sampling is undertaken in the vicinity of the identified sources of contamination in addition to soil characterisation samples taken from grazing areas to create a detailed site investigation (DSI) prior to earthworks consent being granted to ensure elevated heavy metals and excessive use of fertilisers are not present. It is also recommended that all waste material and soils impacted by the presence of the offal pit / farm dump be removed during any redevelopment works within the site.

## 5. Limitations

The findings of this report should be read together with “Important Information ‘About Your Coffey Environmental Report’ (attached).

## 6. References

**MfE (2003)** Contaminated Land Management Guideline No. 1: Reporting on Contaminated Sites in New Zealand. Ministry for the Environment, Wellington, New Zealand. (Revised 2011).

**MfE (2004)**. Ministry for the Environments Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils. Ministry for the Environment, Wellington, New Zealand. (Revised 2011).

**MfE (2011)**. Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

**Edbrooke S.W., Forsyth, P.J., and Jongens, R. (2014)**. Geological Map of New Zealand 1:250 000. Prepared by Edbrooke S.W., Forsyth, P.J., and Jongens, R. Lower Hutt, New Zealand. Institute of Geological and Nuclear Sciences Limited (GNS).

# Important information about your **Coffey** Environmental Report

## **Introduction**

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

## **Your report has been written for a specific purpose**

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

## **Limitations of the Report**

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept apprised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statutes and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

## **Interpretation of factual data**

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

### **Recommendations in this report**

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

### **Report for benefit of client**

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

### **Interpretation by other professionals**

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see

how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

### **Data should not be separated from the report**

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

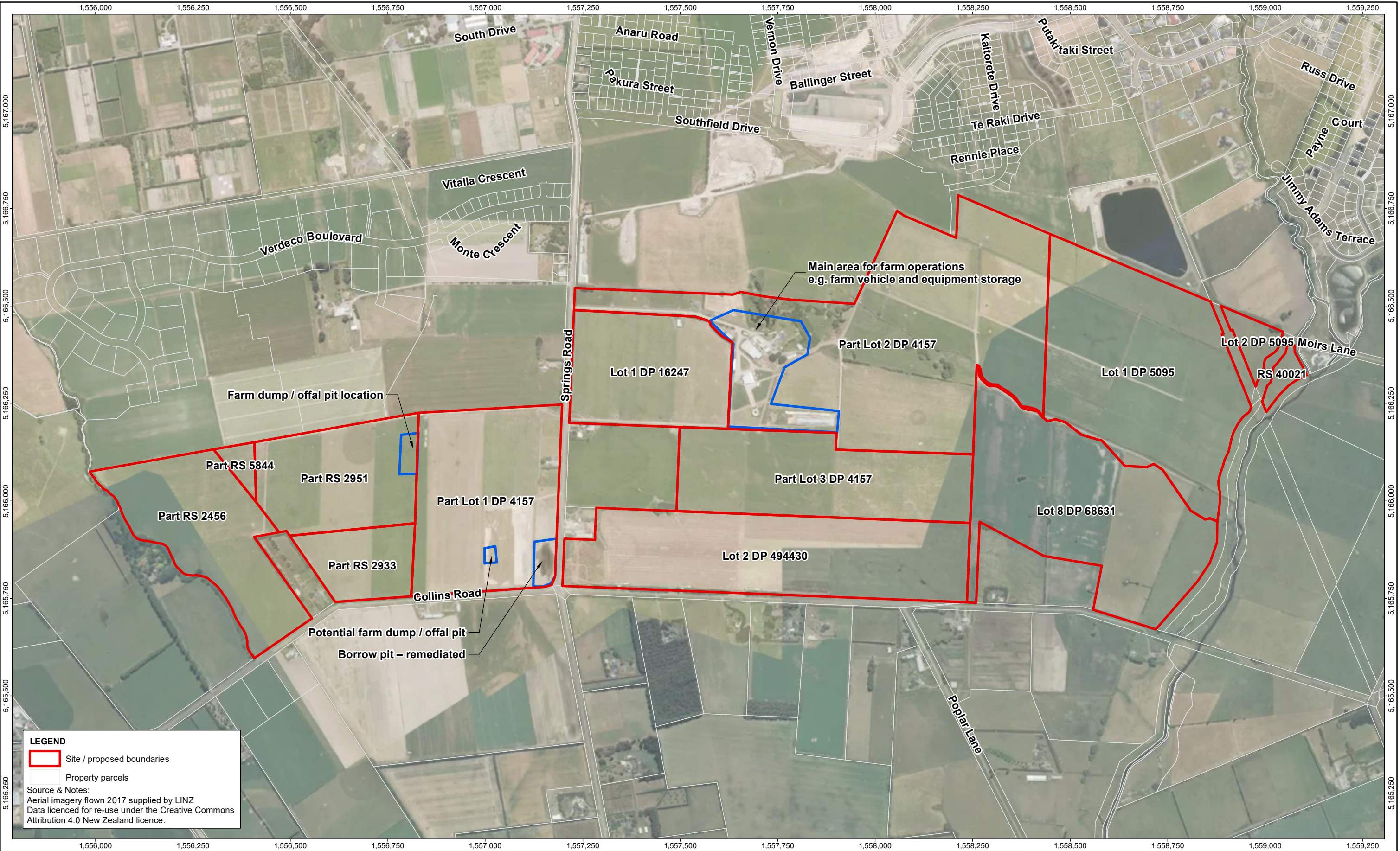
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### **Responsibility**

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

## Figures






**LEGEND**

Site / proposed boundaries

Property parcels

Source & Notes:  
Aerial imagery flown 2017 supplied by LINZ  
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revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RZ	RM	14.10.20



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SCALE1:9,000 (A3)METRES

Projection: NZGD 2000 New Zealand Transverse Mercator

drawn	RZ
approved	RM
date	14.10.2020
scale	AS SHOWN
original size	A3



client: ROLLESTON INDUSTRIAL DEVELOPMENTS LTD.		
project: 1491 SPRINGS ROAD, LINCOLN, CHRISTCHURCH		
title: SITE PLAN		
project no: 773-CHCGE280252	figure no: 01	rev: A

HXD ref: SPRINGS\_01\_GIS002\_1



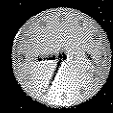
## **Appendix A – Historical aerial photographs**







1963



3/55/43

19



SN 2713 D/8

948

1974









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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Kilometres

Scale 1:6,000 @A3

Map Created by Canterbury Maps on 15/07/2020 at 12:25 PM

## **Appendix B – Selected site photographs**



Photograph 1: Potential farm dump / offal pit location showing general material and site cover.



Photograph 2: General site cover and land-use.



scale	drawn	AB		client:	Carter Group			
	approved	RM		project:	1491 Springs Road Preliminary Site Investigation			
	date	Oct-20		title:	Site photographs			
	scale	NTS		project no:	773-CHCGE280252	figure no:	1 of 3	rev:
	original size	A4						



Photograph 3: Known offal pit / farm dump within western section of the site.



Photograph 4: Raised above ground petrol tank. Minor staining observed.



scale	drawn	AB		client:	Carter Group			
	approved	RM		project:	1491 Springs Road Preliminary Site Investigation			
	date	Oct-20		title:	Site photographs			
	scale	NTS		project no:	773-CHCGE280252	figure no:	2 of 3	rev:
	original size	A4						



Photograph 5: General farm equipment and storage on hardfill.



Photograph 6: Farm vehicle and equipment storage on hardfill.



scale	drawn	AB		client:	Carter Group			
	approved	RM		project:	1491 Springs Road Preliminary Site Investigation			
	date	Oct-20		title:	Site photographs			
	scale	NTS		project no:	773-CHCGE280252	figure no:	3 of 3	rev:
	original size	A4						

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