

Appendix K:

Preliminary Site Investigation

WSP Opus





144 Ripponvale Road, Cromwell

Preliminary Site Investigation for NZ Cherry Corp



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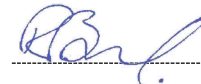
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Report Checklist

Summary contaminated sites report checklist					
Report contained in this document	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Report sections and information to be presented	PSI	DSI	RAP	SVR	MMP
Executive summary	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scope of work	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site identification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site history	<input checked="" type="checkbox"/>	S	S	S	S
Site condition and surrounding environment	<input checked="" type="checkbox"/>	S	S	S	S
Geology and hydrology	A	<input type="checkbox"/>	S	S	S
Sampling and analysis plan and sampling methodology	A	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
Field quality assurance and quality control (QA/QC)	N	<input type="checkbox"/>	X	<input type="checkbox"/>	S
Laboratory QA/QC	N	<input type="checkbox"/>	X	<input type="checkbox"/>	X
QA/QC data evaluation	N	<input type="checkbox"/>	X	<input type="checkbox"/>	X
Basis for guideline values	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Results	A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S
Site characterisation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remedial actions	X	X	<input type="checkbox"/>	S	S
Validation	X	X	X	<input type="checkbox"/>	S
Contaminated materials management plan (CMMP)	X	X	<input type="checkbox"/>	S	S
Ongoing site monitoring	X	X	X	N	<input type="checkbox"/>
Conclusions and recommendations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Key:

PSI - preliminary site investigation report
SIR - detailed site investigation report

RAP - site remedial action plan

SVR - site validation report

MMP - ongoing monitoring and management plan

A - Readily available information should be included

S - A summary of this section's details will be adequate if detailed information has been included in an available referenced report

N - Include only if no further site investigation is to be undertaken

X - Not applicable and can be omitted.

(MfE. *Contaminated Land management guidelines No. 1*. 2011a)

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Revision	Details
1	Plan change information from client incorporated

Executive Summary

A Preliminary Site Investigation (PSI) has been undertaken in order to assess the potential for contamination to be present at 144 Ripponvale Road, Cromwell (the Site). This PSI has been commissioned as part of a plan change request which may involve rezoning a portion of the land. It is proposed that parts of the site are to be rezoned for a rural residential (lifestyle) end use with other areas remaining as production land (horticultural use).

The site requires this assessment under the NESCS guidance as current site activities are outlined in the Hazardous Activities and Industries List (HAIL).

As part of this PSI assessment the following works were completed:

- A site walkover to assess the current site condition and its surrounding environment;
- An assessment of historical information relating to the site and its surroundings (this may be from documented or anecdotal evidence) including the review of historical aerial photographs;
- A review of information relating to resource consents, geological conditions and hydrology of the site;
- A review of local authority GIS records and searches of ORCs HAIL register; and
- Characterisation of the site in line with NES guidance giving recommendations of remedial options should they be required

A summary of the main findings of this report concludes that:

- The site has been subject to unlicensed landfilling activities in the past which in places are ongoing;
- Orchards have been present on areas of the site which have been subjected to spraying in line with best practice at the time with a range of pesticides;
- Petroleum storage both above ground and below ground is or has been undertaken in the central area of the site around the buildings.
- The site is currently mixed use open pastoral land with orchards and grazing livestock present;
- Livestock holding pens are present on site which may have historically been used for the application of pesticides as part of a spray race operation
- Storage of pesticides and other livestock chemicals are held within locked buildings with only small quantities kept on site at any given time;
- The underlying geology comprises glacial gravel to the east and schist to the west which has a mobile groundwater regime;
- No obvious signs of vegetation dieback was noted in any location across the site.

The Preliminary Site Investigation has revealed that uses on the site include unlicensed landfilling, orchards and fuel storage. Anecdotal evidence indicates that the landfill operations are for offal pits as well as other miscellaneous waste materials. Spraying of orchards is an ongoing process with records kept of the pesticides used in recent years.

The risks to human health have been assessed on the basis of the historical activities which may have occurred on specific areas of the site and can be split in to the following activities:

- **Orchards:** The risks associated with the application of pesticide sprays within the orchards is considered to be Low to Moderate;
- **Petroleum storage:** The risks associated with the storage of petroleum products and spillages within the near surface environment are considered to be Moderate;
- **Pesticide Storage and mixing:** The risks associated with the storage of pesticides within the enclosed store and mixing of these is considered to be Moderate

- **Unlicensed landfilling:** The risks to human health and the environment associated with the unlicensed landfill (not the offal pits) are considered to be High
- **Offal Pits:** The risks associated with the offal pits due to their depth are considered to be Low to Moderate;
- **Livestock storage and spraying:** The risk to human health associated with potential spray race operations within the stock yard is considered to be Moderate to High.

Taking into consideration the information herein, it is considered more likely than not that the risk to human health and groundwater associated with potential contamination derived from historic and ongoing activities across the site as a whole is considered to be **Moderate to High**

Based on the results of this investigation, WSP Opus recommends that areas where rezoning to a more sensitive rural residential (lifestyle) use and/or development of the site is proposed, a Detailed Site Investigation should be undertaken on the specific site areas where HAIL activities have been identified in order to satisfy the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS), more specifically:

- **Orchards:** Investigation of the historic areas of orchard activities be undertaken where rezoning to a more sensitive use is proposed to determine the risks posed to human health with respect to potential future ground disturbance. Taking in to consideration the large areas of land involved with this proposed development, investigations should be designed to give a broad overview of potential contaminants initially with a more detailed second phase of investigation undertaken on areas highlighted as being a risk to human health within the initial screening assessment.
- **Petroleum storage:** Investigation and/or removal of the buried fuel storage tank should be undertaken in order to assess whether leakages to groundwater have occurred and to remove the source of any potential ongoing contamination from this tank.
- **Pesticide Storage and mixing:** Site specific investigation of the areas where pesticide storage and more importantly mixing occurs should be undertaken as these areas have an increased likelihood of concentrated contaminants being present.
- **Unlicensed landfilling:** Further assessment of areas where landfilling has been undertaken should be undertaken. This assessment should take in to consideration potential ground gas and groundwater contamination issues associated with unlicensed landfilling with consideration given to remediation/removal of landfilling materials.
- **Offal Pits:** At this stage no further investigation of the offal pits are considered necessary due to their depth of burial. Should these areas be proposed for deeper excavation for foundation solutions then this recommendation should be reassessed to protect workers coming in to contact with possible microbial contamination.
- **Livestock storage and spraying:** The areas where livestock have been held within pens, particularly close to the buildings in the central area of the site, should be investigated to assess if spray race activities have been undertaken in these areas.

Should any other ground conditions be encountered that are not covered herein a Suitably Qualified and Experience Practitioner in contaminated land assessment should be consulted in order to assess the risks to human health and sensitive receptors

Prior to any demolition being carried out an assessment of the buildings should be undertaken by a specialist asbestos in buildings assessor in order to determine the risks posed prior to any demolition on site. This would effectively reduce the potential for soil contamination associated with asbestos containing materials in later stages of development and protect the demolition contractors from the release of un-investigated potentially hazardous materials

1 Introduction

A Preliminary Site Investigation has been undertaken on behalf of NZ Cherry Corp for a piece of land located on Ripponvale Road, Cromwell (herein referred to as 'the site') in order to assess the potential for contamination to be present on the site.

The site is located at 144 Ripponvale Road and its surroundings to the north of the road. This PSI has been commissioned as part of a plan change request which may involve rezoning a portion of the land. It is proposed that parts of the site are to be rezoned for a rural residential (lifestyle) end use with other areas remaining as production land (horticultural use). A preliminary structure plan for the site is presented in Appendix A

1.1 Objective

This report has been prepared in order to assess the potential for ground contamination to be present across the site. The presence of orchard activities on parts of the site indicates that the site is considered to be within the remit of the National Environmental Standard for Assessing and Managing Contaminants in Soil (NESCS) 2011, Appendix C - Hazardous Activities and Industries List (HAIL) namely:

A10. Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds.

In addition the site is currently a working farm with livestock and packing sheds located at various locations. As such the following objectives have been identified:

- A site walkover to assess the current site condition and its surrounding environment;
- An assessment of historical information relating to the site and its surroundings (this may be from documented or anecdotal evidence) including the review of historical aerial photographs;
- A review of information relating to resource consents, geological conditions and hydrology of the site;
- A review of local authority records and searches of Otago Regional Councils (ORCs) HAIL register; and
- Characterisation of the site in line with NES guidance giving recommendations of remedial options should they be required.

1.2 Scope of Work

In order to achieve the objectives set out above, the following scope of works was undertaken:

- A review of the site history from aerial photographs and anecdotal evidence;
- A site inspection by a Suitably Qualified and Experienced Practitioner;
- A review of documented data from ORC and Central Otago District Council (CODC) with respect to the site;
- Assessment of the geological and hydrogeological conditions for the site and
- Characterisation of the site to determine the environmental and human health risks associated with the site along with recommendations for further work should it be deemed necessary.

2 Site Identification

The site is located at 144 Ripponvale Road, approximately 2.5km west of Cromwell town centre as shown on Figure 1 below. Site details are provided in Table 1.

Table 1: Site Identification

Site Address	144 Ripponvale Rd, Cromwell
Legal Description	Sections 4, 5, 11, Pt 25, 26, 27, 28, 54 Block III Cromwell SD,
Titles	126180 OT7C/632 OT106/99
Owner	Leyser Brothers Limited
Approximate total site area	220ha
Territorial Authority	Central Otago District Council (CODC)

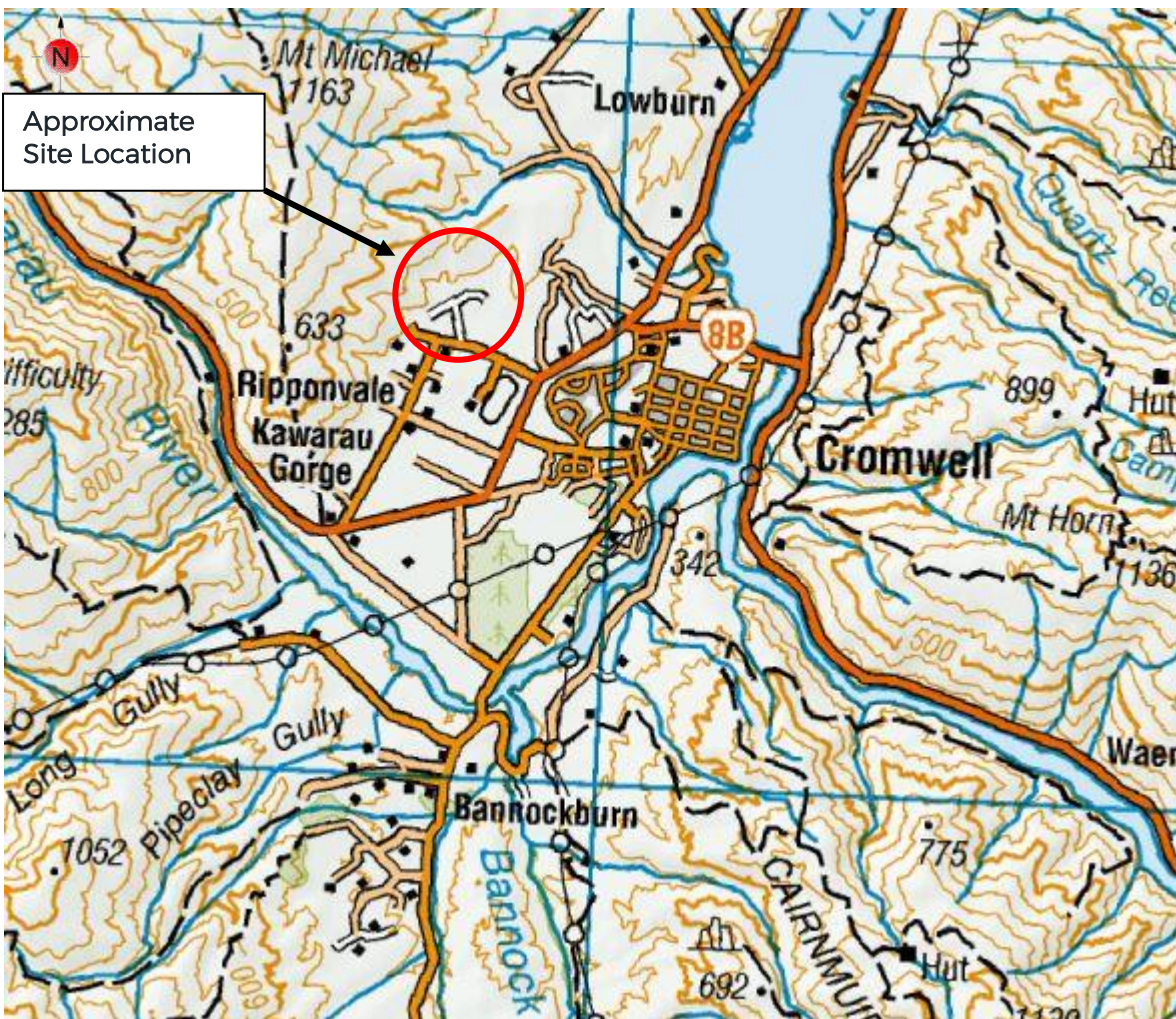


Figure 1: Site Location Plan

A Quickmap diagram detailing the current legal site boundaries, and appellations of properties nearby are shown in Figure 2 along with the approximate location of the site under investigation.

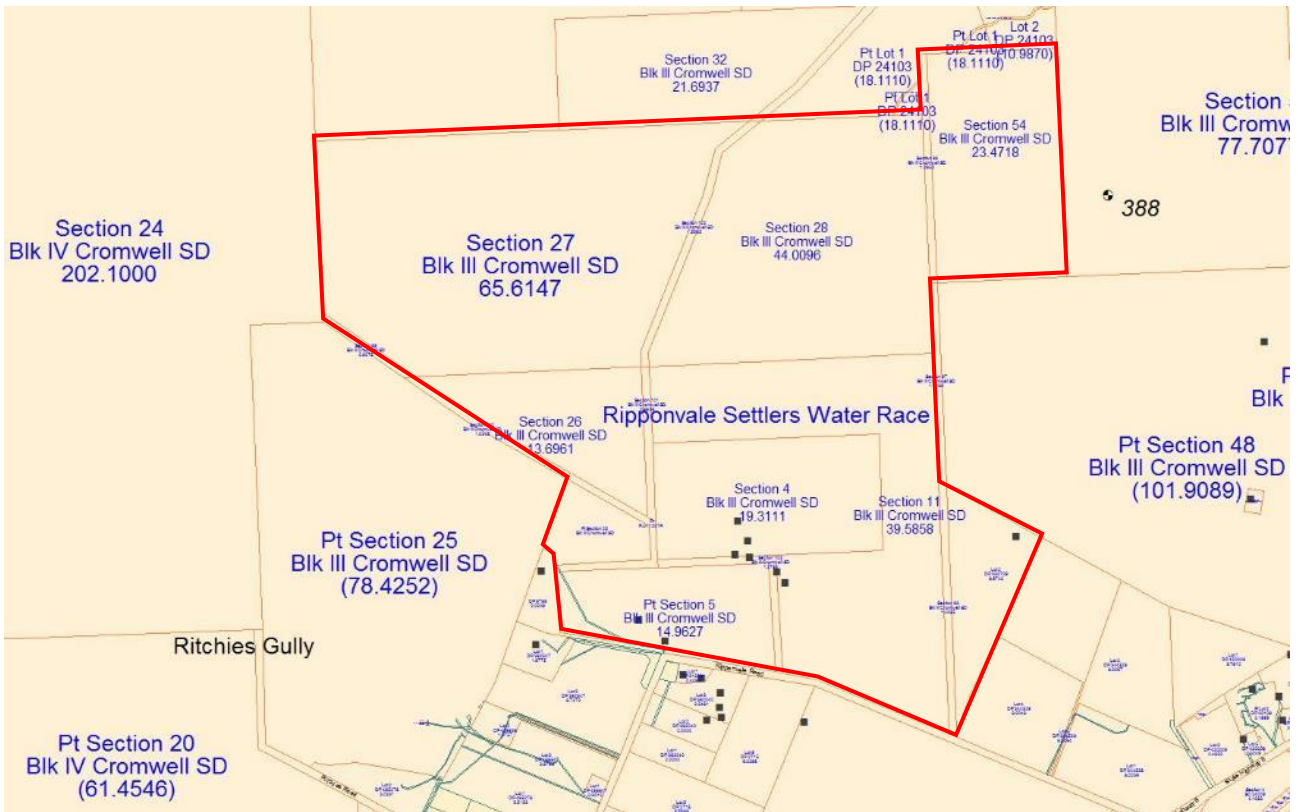



Figure 2: Quickmap of site and surrounds (the piece of land)


3 Site Description

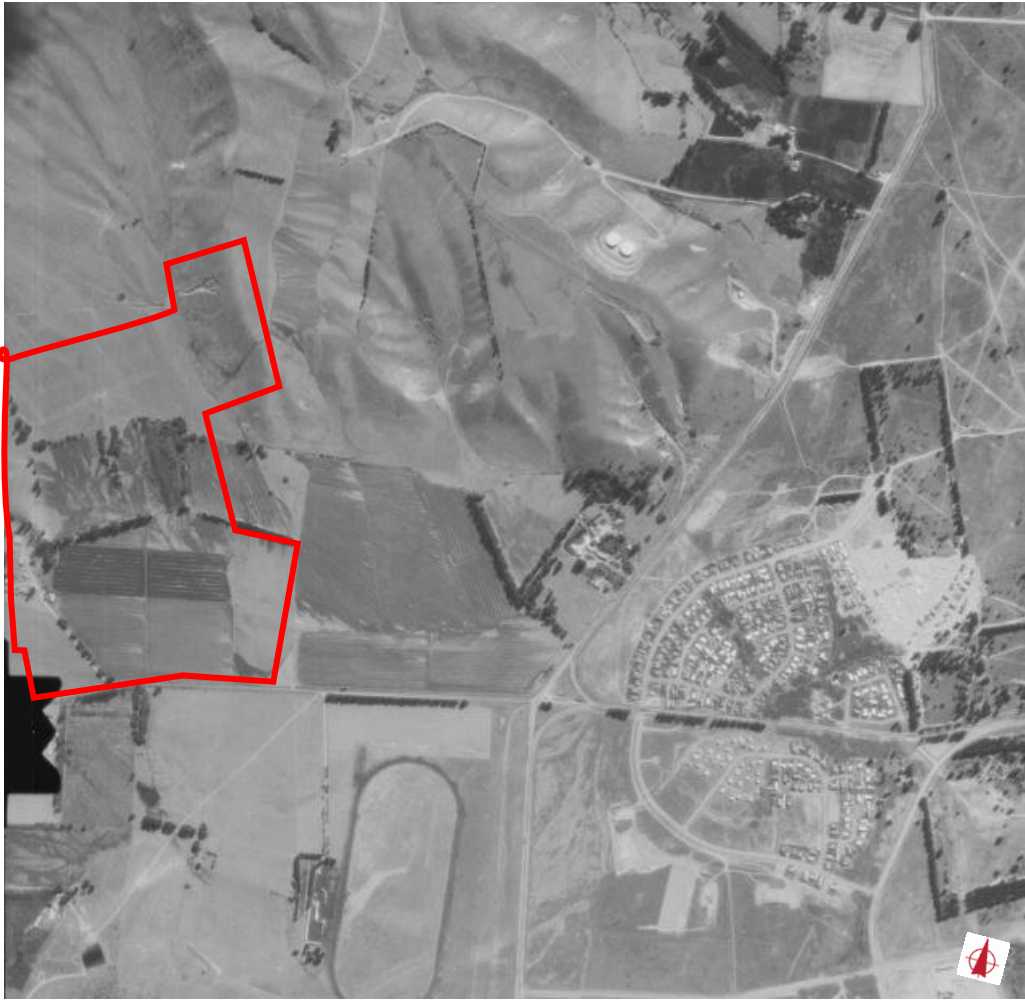
3.1 Site History


Details of the site history have been gained from a review of sources including historical aerial photographs from Google Earth and Retrolens, historical topographical maps from Maps Past, and a review of WSP Opus’s Quickmap ArcGIS database. Historical information is presented in Appendix A with aerial photos presented in Table 2.

Table 2: Site History, (approximate site location is outlined in red)

Photograph Year and Source	Observations
1958 Retrolens	



Photograph Year and Source	Observations
1979 Maps Past	

Photograph Year and Source	Observations
1982 Retrolens	

Photograph Year and Source	Observations
1983 Retrolens	

Photograph Year and Source	Observations
1984 Retrolens	
1991 retrolens	

Photograph Year and Source	Observations
2003 Retrolens	

Photograph Year and Source	Observations
2012 Google Earth	
2015 Google Earth	

3.1.1 Certificates of Title

A search for relevant certificates of title was undertaken for the site along with any associated survey plans. This was to help determine the historical ownership and layout of the site. These details may give an indication as to past uses on the site and the potential for HAIL activities. Relevant certificates of title and survey plans are also presented within Appendix A.

3.1.2 Council Records

A review of the GIS database held by CODC has revealed nine building consents and two resource consents for the site area (112-144 Ripponvale Rd). Details of these consents are summarised in Table 3.

Table 3: CODC Consent Details

Type of Consent	Date	Details
Building	Feb 1995	Additions to Packhouse
	June 1997	Installation of fire
	November 1998	Additions to dwelling
	November 1998	Farm building
	June 2004	New domestic garage
	June 2004	Erect domestic garage
	November 2007	Smoko Room and ablution block
	July 2012	Install a new fire appliance
	July 2015	Internal alterations to existing dwelling
Resource	November 2003	2 Lot rural subdivision
	November 2003	Subdivision creating 15 allotments of 2ha each

3.1.3 HAIL Database Search

A review of the HAIL database held by ORC has revealed that the site does not currently appear on the database. However it goes on to state that from current aerial photographs the land does appear to be used for horticultural purposes which may be associated with persistent pesticide storage or use. Aerial photographs also show the presence of stockyards, which may be associated with sheep dips.

The response continues indicating that ‘If your enquiry relates to a rural property, please note that many current and past activities undertaken on farms may not be listed on the database, as they can be more difficult to identify. Activities such as use, storage, formulation, and disposal of pesticides, offal pits, landfills, animal dips, and fuel tanks have the potential to contaminated land’.

A copy of the HAIL search results is provided in Appendix A.

It should be noted that the lack of detail on a property file or “no files of note” entry is not confirmation of no HAIL activities being present, or historically present on the site, it merely represents the council’s knowledge of the site.

3.1.4 Anecdotal Evidence

Discussions with the current site owner, Mr Leyser, indicate that the property has been in his possession since approximately 1973. In that time the paddocks on site have been in use for various farming purposes including various livestock (sheep, cattle and deer) and orchards. Much of the current pastoral land present was at some stage planted with fruiting trees including pears, apples and stone fruit.

Previous offal pits were delineated by Mr Leyser during the site inspection, however it is unknown if further landfilling beyond those noted and described have been undertaken on site.

3.1.5 Historic Orchards

Based on the findings of the historical images in Table 2 and anecdotal evidence, an overview of the locations where orchards have historically been located (or may have been located) have been assessed and are presented in Figure 3.



Figure 3: Historic Orchard Locations

3.1.6 Heritage

The Heritage New Zealand Pouhere Taonga Act 2014 makes it unlawful for any person to modify or destroy, or cause to be modified or destroyed, the whole or any part of an archaeological site without the prior authority of Heritage New Zealand.

In order to establish the heritage status of the site the Heritage New Zealand database was consulted. The site was not found on the database¹.

3.2 Geology and Hydrogeology

The geology of the site is shown on the 1:250,000 scale GNS Geology Web Map extract (accessed October 2017) as shown in Figure 4.

This map indicates the site to be underlain by Middle Quaternary glacial outwash deposits comprising muddy to sandy gravel to the east with the western part of the site underlain by Permian to Triassic Schist comprising psammitic and subordinate pelitic schist (TZIV); including areas and bands of greenschist, minor marble and metachert, and rare ultramafic bodies.

The eastern side of the property is located within the western part of the Cromwell Terrace Aquifer catchment. The Cromwell Terrace Aquifer is an unconfined aquifer with a free water table. The mean depth to the water table is 20m and the aquifer has good water quality.

The nearest water bodies are various dams located on the site. The area is crossed by numerous irrigation features including a water race on the eastern site boundary however the nearest flowing surface water is the Kawaru Arm of Lake Dunstan approximately 2.7km south east.

A search of ORC well database indicates that there is one operation well located on the site which was installed in June 2014. This well is utilised for irrigation, stock feed and drinking purposes. The bore is located on Sec 11 Blk III Cromwell SD, adjacent to the cherry orchard to the east. Details of the water permit are presented in Appendix A.

A review of the GNS Active Faults Database indicates that the nearest active fault runs north east to south west directly though the western part of the site.

GNS Active Faults Database names the fault as the Pisa Fault (#8402). The fault is reverse with a recurrence interval of >10,000 to <=20,000 years (V) and a very low slip rate. There is no further information available relating to this fault line

¹ <http://www.heritage.org.nz/the-list>

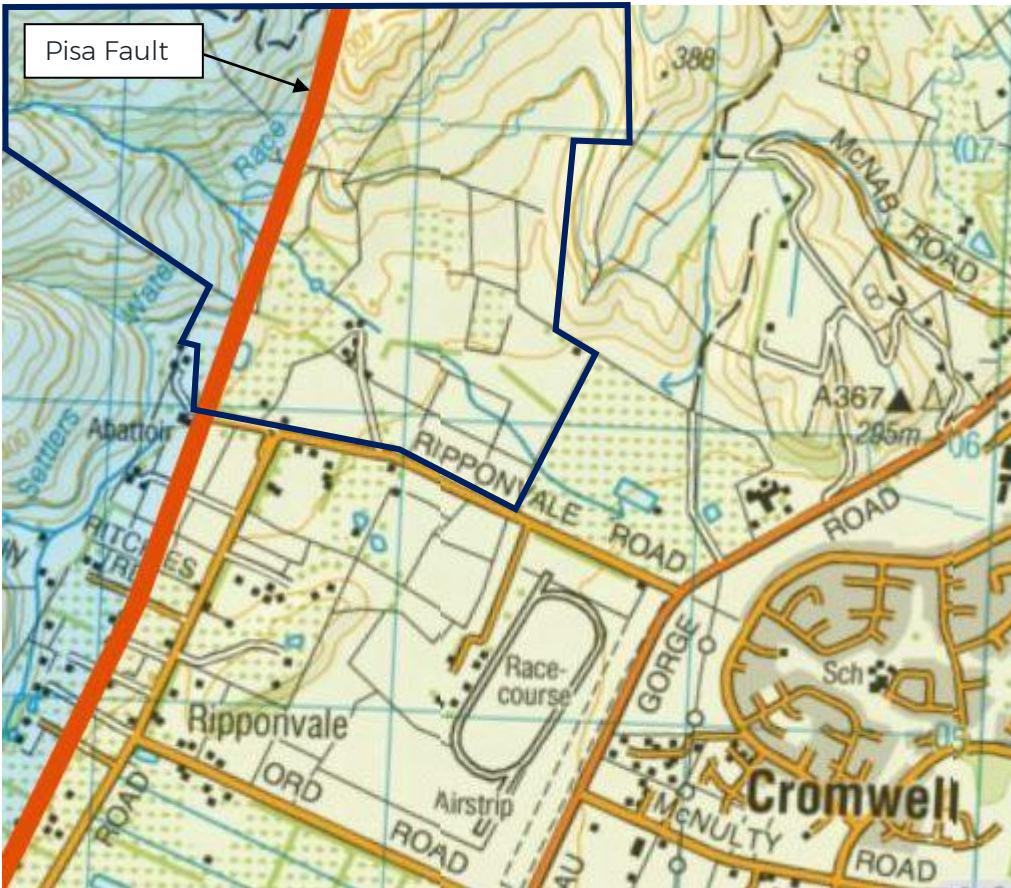


Figure 4: GNS Geological Extract

4 Site Inspection

4.1 Site Condition and Surrounding Environment

A site walkover was undertaken as part of a preliminary Environmental Site Assessment on 23rd March 2018 by a WSP Opus SQEP. A summary of the inspection is outlined below and a selection of site photographs presented within Appendix B. These photos are numbered to correspond to the areas detailed below.

The site was accessed off Ripponvale Rd on the southern boundary of the site. 144 Ripponvale Road is located to the north of the main site access and an alternative entrance further along Ripponvale Rd was used to enter the site.

The site inspection centred on activities undertaken in the central part of the site where the majority of the site buildings were located. For the purposes of this inspection the site was split into areas which are described in more detail in Table 4 below and indicated on the site layout plan as Figure 4

Table 4: Site Walkover Summary

Site Area (Fig 5)	Description of Activities
A	Waste pit filled with cardboard, bin liners containing unknown materials, empty plastic drench containers and other miscellaneous items Remaining area to the east of the pit contained other deposited items including:

Site Area (Fig 5)	Description of Activities
	<ul style="list-style-type: none"> • Antifreeze wire bound container • Empty diesel drum • Wood • Wire fencing • Machinery • Small disused fuel tank • Empty drenching containers • Mobile fuel/water container
B	<p>Open sided tractor/machinery shed with a shipping container located adjacent to the southern side. Materials within the shed included:</p> <ul style="list-style-type: none"> • Two diesel drums containing product • Pesticide spray unit • Batteries on a pallet • Bags of unknown material (assumed to be for cattle feed)
C	<p>Worker accommodation and site office with numerous disused cars (no number plates) parked along the eastern side of the buildings. A locked outhouse containing livestock drenching chemicals which were indicated to be mainly organic in nature is located here.</p>
D	<p>Residential housing which have been present on site since at least 1958 (visible on aerial photograph of this year).</p>
E	<p>Packing shed and cold store with current refrigeration unit on northern side of building.</p>
F	<p>Waste pit containing miscellaneous items. Site owner indicated that any unwanted items from within Area A were disposed of in to this pit with materials burnt before being buried with 1m of overburden.</p>
G	<p>Disused underground fuel storage tank with vent (petrol).</p>
H	<p>Offal Pits. At least three have already been infilled with a fourth currently open to a depth in excess of 3m containing deceased calves).</p>
I	<p>Disused cars and farm machinery.</p>
J	<p>Pesticide chemical store with Hazchem sign above door. Concrete floor inside and on entrance in a moderate condition. A list of chemicals used was on wall and is detailed in Appendix C. The store itself was unkempt as can be seen in the site photographs.</p>
K	<p>Above ground diesel storage tank with no bunding.</p>
L	<p>Disused refrigerant unit inside building.</p>
M	<p>Old tyre store which also contains machinery.</p>
N (separate plan - Fig 6)	<p>Old offal pit located away from buildings on hillside to the north west of the site.</p>
P (separate plan - Fig 6)	<p>Large water containers adjacent to hummocky ground. This area is indicated by site owner to contain buried wire fencing and steel alongside the drainage ditch.</p>



Figure 5: Site Description Areas



Figure 6: Wider Site Area for description purposes

In addition to the site walkover the site was inspected via helicopter on 22nd March 2018 which gave aerial views of potentially contaminated area of the site. Photographs taken at the time of this aerial site inspection are also presented in Appendix B.

Assessment of the activities undertaken on the site indicates that various pieces of land on the site have been subject to activities on the HAIL. As such the following HAIL activities apply to the site in accordance with NESCS guidance:

A10: Persistent pesticide bulk storage or use including sports turfs, market gardens, orchards, glass houses or spray sheds

A13: Petroleum or Petrochemical Industries... ..or bulk storage of Petroleum or petrochemicals above or below ground

A17: Storage tanks or drums for fuel, chemicals or liquid waste

G3: Landfill sites

G5: Waste Disposal to land

5 Conceptual Site Model

This section of the report relates to the assessment of contamination arising from the previous and current land uses, both on and off the site that may impact on development proposals. This is achieved by detailing the nature and extent of contamination, the potential migration pathways and to identify potential receptors to the extent possible based on information gathered from the desk study and site visit. Data gaps and uncertainties are identified during the preparation of the conceptual model, which assists in designing a more detailed investigation.

The following conceptual site model been identified based on a land use change for a rural use across the site. These may need to be amended in light of any further development proposals in the future:

5.1 Potential Sources of Contamination

A review of all data sources and anecdotal evidence indicates that the site has been subject to uncontrolled filling in some areas along with orchards, pesticide storage and fuel storage. Buildings on the site were also considered to be of an age where asbestos may have been used within the building fabric in some instances.

Potential sources of contamination typically associated with these activities may include:

- Multi-residue pesticides
- Heavy metals;
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Petroleum Hydrocarbons (TPH) with BTEX; and
- Asbestos.

5.2 Potential Pathways

Plausible pathways such as inhalation, dermal contact, ingestion, leaching, and migration of contaminated groundwater, migration of ground gases and hazardous vapours as well as aggressive attack on construction materials have all be considered as part of the development of the conceptual site model for the piece of land on this site.

The most plausible migration pathways are dependent upon the type of contaminants and are considered to be:

- Inhalation of contaminated dust (particularly asbestos containing materials should demolition of buildings occur);
- Dermal contact with contaminated soils/water;
- Ingestion of contaminated material or food; and
- Leaching of contaminants into groundwater.

5.3 Potential Receptors

Given the proposed development on the site in addition to potential contaminants associated with historic uncontrolled filling, then the most sensitive receptors identified are as follows:

Residents and visitors (end-users) to the site;

Construction workers during earthworks and construction; and

Environmental receptors including groundwater.

Using the data obtained from various sources and brought together within this report, a conceptual site model (CSM) has been derived for the site and is presented in Figure 7.

The term **possible pollutant linkage** as used above is defined as one that has the potential to represent unacceptable risks to human health or the environment but has not been identified through risk assessment. Where a possible pollutant linkage has been identified above, these should be subjected to investigation and risk assessment during a DSI in order to establish whether a **significant pollutant linkage** exists.

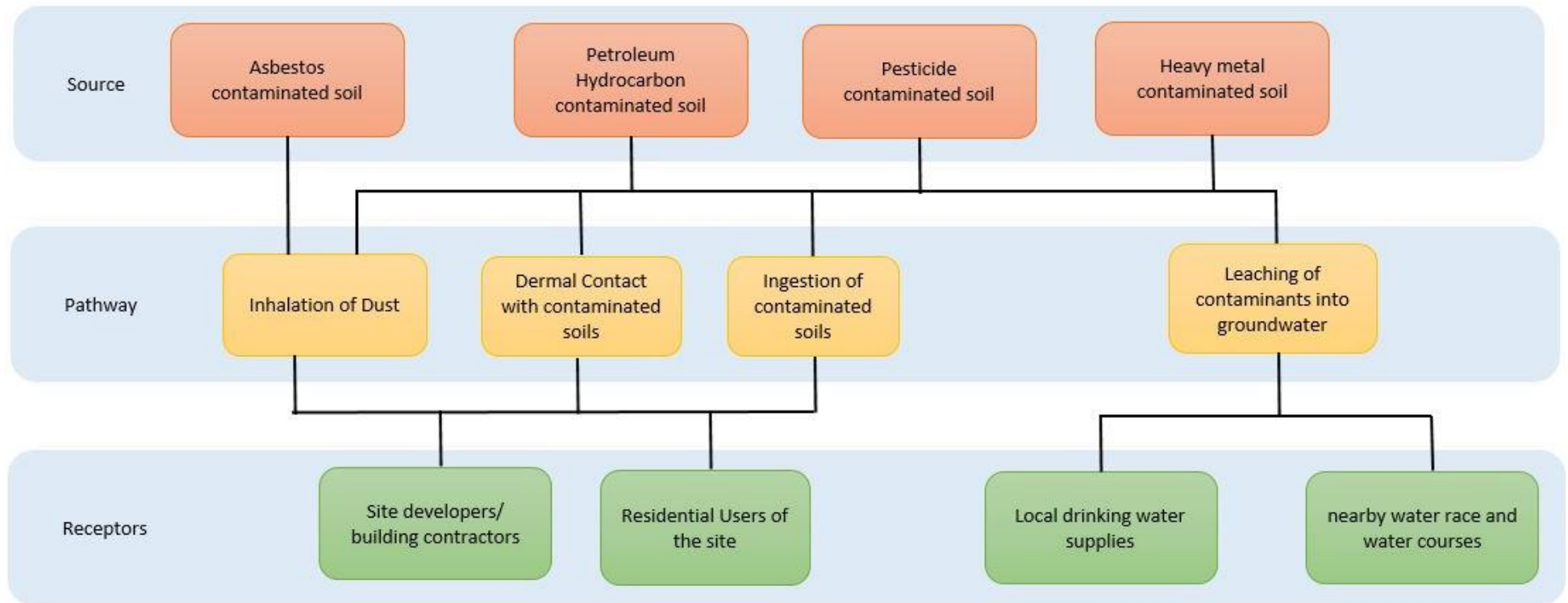


Figure 7: Conceptual Site Model

5.4 Discussion of Conceptual Site Model

Site history, anecdotal evidence, historical aerial photography and site inspections indicate that a number of HAIL activities have been or are currently present at the site.

Aerial photography provides clear evidence that the site has been used for production land since at least 1958 and has undergone a number of changes to the buildings.

No records exist of the type of pesticides historically used from this activity however it is considered plausible given its age that older pesticides may have been used at this site. In the absence of any soil sampling data identifying potential presence of heavy metals in soils it is unclear if contaminants exist in the soils. Therefore, a data gap exists regarding the actual risks should earthworks be undertaken at site in terms of human health:

Hydrocarbon storage was noted within the central 'hub' of the site in and around the buildings. Spillage over a number of years appears to have occurred adjacent to these locations and the integrity of the underground storage tank could not be ascertained during the site inspection.

There is therefore a risk of exposure to workers on site from hydrocarbon contaminated soils and should these soils remain the exposure risk to site occupiers must also be considered.

Groundwater beneath the site is considered to be a sensitive aquifer with extractions occurring along Ripponvale road for both irrigation and domestic consumption. Migration of contaminants from site should therefore be considered as the local granular soils are likely to enable migration to occur.

A DSI would be required to fill these data gaps and refine the conceptual site model if earthworks or a change in land use were proposed at the locations identified in table 4.

6 Basis for Guideline Values

For contaminated site assessments the hierarchy of reference documents containing guidelines for soils and waters, the MfE Contaminated Land Management Guidelines No 2 (November 2003) is referred to.

The site currently comprises open pasture land, orchards and general production land and is currently zoned as a Rural Resource Area according to the district plan.

An area of the site is proposed for rezoning from Rural Resource to a new rural zone (Rural Resource Area (5)) which is likely to incorporate rural lifestyle blocks. As a rural residential/lifestyle land use is considered the most sensitive end use of the site as detailed within Table 5, the recommendations outlined in this report must be considered when changing the land use and developing this land.

The primary human health receptors have been determined to be site workers, residential users and visitors following any development of sections of the site.

Table 5: Land Use Scenario

Scenario	Description
Rural / lifestyle block	<p>Rural residential land use, including home-grown produce consumption (25 per cent). Applicable to the residential vicinity of farm houses for protection of farming families, but not the productive parts of agricultural land.</p> <p>Note: Consumption of eggs, milk and meat from animals raised on site is excluded. Produce consumption is limited to home-grown vegetables. Sites for which consumption of home-grown eggs, milk or meat is important will need to be evaluated on a site-specific basis.</p>
Residential	Standard residential lot, for single dwelling sites with gardens, including home-grown produce consumption (10 per cent).
High-density residential	Urban residential with limited soil contact, including small ornamental gardens but no vegetable garden (no home-grown produce consumption); applicable to urban townhouses, flats and ground-floor apartments with small ornamental gardens, but not high-rise apartments.
Parks / recreational	Public and private green areas and reserves used for active sports and recreation. This scenario is intended to cover playing fields and suburban reserves where children play frequently. It can also reasonably cover secondary school playing fields but not primary school playing fields.
Commercial / industrial outdoor worker (unpaved)	Commercial / industrial site with varying degrees of exposed soil. Exposure of outdoor workers to near-surface soil during routine maintenance and gardening activities with occasional excavation as part of maintaining subsurface utilities (ie, a caretaker or site maintenance personnel). Also conservatively applicable to outdoor workers on a largely unpaved site.

7 Site Characterisation

The purpose of this preliminary site investigation, is to provide as assessment of the historical land uses to determine whether the activities have, more likely than not, resulted in contamination of the soil and underlying groundwater that may be hazardous to human health.

On the basis of a review of information currently available, as well as observations made during the site inspection, and through the compilation of a conceptual site model our assessment of the site is as follows:

- The site has been subject to unlicensed landfilling activities in the past which in places are ongoing;
- Orchards have been present on areas of the site which have been subjected to spraying with a range of pesticides;
- Petroleum storage both above ground and below ground is or has been undertaken in the central area of the site around the buildings;
- The site is currently mixed use open pastoral land with orchards and grazing livestock present;
- Livestock holding pens are present on site which may have historically been used for the application of pesticides as part of a spray race operation;
- Storage of pesticides and other livestock chemicals are held within locked buildings with only small quantities kept on site at any given time;
- Buildings present on the site are likely to have been built prior to 1970, therefore there is a possibility that asbestos and lead based paints may have been used within the building fabric and contaminated near surface soils within the vicinity of the structures.
- The underlying geology comprises glacial gravel to the east and schist to the west which has a mobile groundwater regime;
- No obvious signs of vegetation dieback was noted in any location across the site.

Potential human health risks have been evaluated using the Likelihood and Consequence scales tabulated below to determine a risk level – low, moderate, high, very high or extreme. The assessed risk level allows prioritisation of investigations and assessment measures.

Table 6: Risk Allocation Table

	Consequence				
Likelihood	Insignificant	Minor	Medium	Major	Catastrophic
Almost certain	Moderate	Moderate	Very High	Extreme	Extreme
Likely	Low	Moderate	High	Very High	Extreme
Possible	Low	Moderate	Moderate	Very High	Very High
Unlikely	Low	Low	Moderate	High	Very High
Rare	Low	Low	Low	Moderate	High

The risks to human health have been assessed on the basis of the historical activities which may have occurred on specific areas of the site and can be split in to the following activities:

- **Orchards:** The risks associated with the application of pesticide sprays within the orchards is considered to be Low to Moderate. This is due to the reduction in the presence of persistent pesticides as time passes due to degradation and leaching, therefore reducing their likely presence at the site;
- **Petroleum storage:** The risks associated with the storage of petroleum products and spillages within the near surface environment are considered to be Moderate. Insufficient information on the removal of store petroleum is available meaning that it is possible these are present on site and will require management;
- **Pesticide Storage and mixing:** The risks associated with the storage of pesticides within the enclosed store and mixing of these is considered to be Moderate due to the potential for spillages to have occurred within this area taking in to consideration the ad hoc manner of storage of the pesticides;
- **Unlicensed landfilling:** The risks to human health and the environment associated with the unlicensed landfill (not the offal pits) are considered to be High. This is because the fill material is uncontrolled it may contain many toxic wastes including chemical drums, asbestos and heavy metals. Exposure to these if unearthed presents a direct threat to those undertaking the works, future users and a migration risk from leachate or soil disturbance.
- **Offal Pits:** The risks associated with the offal pits taking in to consideration their depth and age are considered to be Low to Moderate. Once buried, decomposition occurs over a period of 3 months to 3 years. If the pit is excavated during this time a biological risk is present. Groundwaters passing through the pit will become contaminated and therefore any wells/bores within at least 500m of the pits should be assessed before consumption occurs;
- **Livestock storage and spraying:** The risk to human health associated with potential spray race operations within the stock yard is considered to be Moderate to High due to the persistence of metals should they have been used on site and their effect on human health.

Taking into consideration the information herein, it is considered more likely than not that the risk to human health and groundwater associated with potential contamination derived from historic and ongoing activities across the site as a whole is considered to be **MODERATE TO HIGH**.

8 Conclusions and Recommendations

The Preliminary Site Investigation has revealed that uses on the site include unlicensed landfilling, orchards and fuel storage. Anecdotal evidence indicates that the landfill operations are for offal pits as well as other miscellaneous waste materials. Spraying of orchards is an ongoing process with records kept of the pesticides used in recent years.

The conceptual site model and initial qualitative human health risk assessment presented herein is based upon information gained from a site inspection, anecdotal evidence, and other sources. The conceptual site model indicates that historical and current site activities have a Moderate to high potential risk of having contaminated areas of the site.

Hazardous activities are noted to have been undertaken on parts of the site. Therefore, more detailed investigation to assess the residual risks associated with these activities would be required in order to provide a greater understanding of the risks in the context of the proposed end use for particular areas of the site.

8.1 Recommendations

Based on the results of this investigation, WSP Opus recommends that areas where rural residential (Lifestyle) rezoning is proposed, a Detailed Site Investigation should be undertaken on the site areas where HAIL activities have been identified. This is to satisfy the requirements of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS), more specifically:

- **Orchards:** Investigation of the historic areas of orchard activities be undertaken where rural residential rezoning is proposed to determine the risks posed to human health with respect to potential future ground disturbance. Taking in to consideration the large areas of land involved with this proposed rezoning, investigations should be designed to give a broad overview of potential contaminants initially with a more detailed second phase of investigation undertaken on areas highlighted as being a risk to human health within the initial screening assessment.
- **Petroleum storage:** Investigation and/or removal of the buried fuel storage tank should be undertaken in order to assess whether leakages to groundwater have occurred and to remove the source of any potential ongoing contamination from this tank.
- **Pesticide Storage and mixing:** Site specific investigation of the areas where pesticide storage and more importantly mixing occurs should be undertaken as these areas have an increased likelihood of concentrated contaminants being present.
- **Unlicensed landfilling:** Further assessment of areas where landfilling has been undertaken should be undertaken. This assessment should take in to consideration potential ground gas and groundwater contamination issues associated with unlicensed landfilling with consideration given to remediation/removal of landfilling materials.
- **Offal Pits:** At this stage no further investigation of the offal pits are considered necessary due to their depth of burial. Should these areas be proposed for deeper excavation in the future, such as for foundation solutions then this recommendation should be reassessed to protect workers coming in to contact with possible microbial contamination.
- **Livestock storage and spraying:** The areas where livestock have been held within pens, particularly close to the buildings in the central area of the site, should be investigated to assess if spray race activities have been undertaken in these areas.

Should any other ground conditions be encountered that are not covered herein a Suitably Qualified and Experience Practitioner in contaminated land assessment should be consulted in order to assess the risks to human health and sensitive receptors.

Prior to any demolition being carried out an assessment of the buildings should be undertaken by a specialist asbestos in buildings assessor in order to determine the risks posed prior to any demolition on site. This would effectively reduce the potential for soil contamination associated with asbestos containing materials in later stages of development and protect the demolition contractors from the release of un-investigated potentially hazardous materials.

9 Applicability and Limitations

This report has been produced on behalf of NZ Cherry Corp and no responsibility is accepted to any third party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of WSP Opus. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill. This report should only be reproduced in full.

We have reviewed information across the entire site. However this investigation concentrates on contamination levels in the soil through the identified 'piece of land' where development is proposed to occur. As such any further earthworks outside of this area of sampling would require further investigation to establish the risk posed to human health.

This report has been prepared for a specific purpose, as agreed between Opus and the Client. A tailored scope of works has been used to achieve the objectives, and the report should therefore not be used for different objectives.

This report has been prepared by WSP Opus with all reasonable skill and care within the terms of the Contract with the Client, and taking account of the information made available by the Client, as well as the staff and resources devoted to it by agreement with the Client. The findings and opinions conveyed via this report are based on information obtained from a variety of sources, as detailed, which WSP Opus believes are reliable. Nevertheless, WSP Opus cannot and does not guarantee the authenticity or reliability of any information supplied by other parties.

The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry best practice. Due to the inherent variation in spatial and temporal patterns of contamination, the interpretation of site conditions at the site is not necessarily a complete description of all material at the site. Whilst this report may express an opinion on the possible configuration of strata or contaminants, this is for guidance only, and no liability can be accepted for its accuracy. Should further data be obtained that differs from that presented in this report, then conclusions and recommendations may no longer be valid.








No soil or ground water samples have been taken for this investigation.

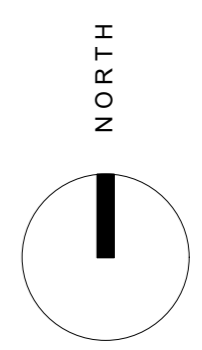
The report is valid at the date of release. The condition of the site may change with time so that the results and interpretation are no longer valid. In addition, guidelines and legislation may change, making assessment of results and recommendations invalid.

Appendix A

Preliminary Structure Plan

144 Ripponvale Road, Cromwell

-  Boundary
-  Activity Area
-  No Build
-  Indicative Open Space and Stormwater Corridor
-  Amenity Edge
-  Indicative Road Network
-  ONL Boundary
- ONL** Outstanding Natural Landscape
- H** Horticulture Area
- RL1** Rural Lifestyle 1
Minimum Lot Size: 2000m2
- RL2** Rural Lifestyle 2
Minimum Lot Size: 3000m2
- RL3** Rural Lifestyle 3
Minimum Lot Size: 4000m2
- RL4** Rural Lifestyle 4
Minimum Lot Size: 1 ha
- RL5** Rural Lifestyle 5
Minimum Lot Size: 3 ha



draft

rough & milne landscape architects
 24 Dunganon Street Tel +64 3 974 7940
 Level 1, Tekoa House
 PO Box 349, Wanaka 9343 info@roughandmilne.co.nz

Preliminary Structure Plan
Shannon Farm Development
144 Ripponvale Road
Cromwell

JOB No.	18065
SCALE	1:5000 @ A2
DATE	20/05/19
DESIGNED	TM
DRAWN	AN
CHECKED	TM
STATUS	FOR REVIEW
DRAWING No.	REVISION
L 1.1	0

Appendix B

Historical Information and Site Searches

144 Ripponvale Road, Cromwell

Appendix B Historical Information and Site Searches

QuickMap Title Details



Information last updated as at 02 Jul 2018

COMPUTER FREEHOLD REGISTER DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier 126180
Land Registration District Otago
Date Issued 05 August 2004

Prior References

OT109/201 OT7C/631

Type Fee Simple
Area 93.0792 hectares more or less
Legal Description Lot 2 Deposited Plan 330709 and Section 4, 11, 98, 101, 103 Block III Cromwell Survey District and Part Section 5, 25 Block III Cromwell Survey District and Part Run 1201R.

Proprietors

Leyser Brothers Limited

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

Subject to Section 241(2) Resource Management Act 1991 (affects DP 330709)

Excepting and reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land

Subject to Section 8 Mining Act 1971 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)

Subject to Section 168A Coal Mines Act 1925 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)

Lot 2 on DP 330709 is subject to interests, easements and rights under the laws relating to Mining, Mines and Minerals.

Subject to a right to convey water over part Section 11 marked A DP 344529, over part Section 98 marked B DP 344529 and over part lot 2 DP 330709 marked C DP 344529 created by easement Instrument 6264801.4 - 23.12.2004 at 9:00 am

The easements created by Easement Instrument 6264801.4 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right to convey water over part marked A, B and C on DP 344529 created by Easement Instrument 7073932.4 - 17.10.2006 at 9:00 am

10402937.1 CAVEAT BY AURORA ENERGY LIMITED - 19.4.2016 at 11:11 am

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QuickMap Title Details Historic Information



Information last updated as at 02 Jul 2018

COMPUTER FREEHOLD REGISTER DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier 126180
Land Registration District Otago
Date Issued 05 August 2004

Historic Memorials

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am
Subject to Section 241(2) Resource Management Act 1991 (affects DP 330709)
Excepting and reserving from Sections 4 and 11 and the part Section 5 herein to Her Majesty the Queen all minerals, mineral oil, gas, metals, coal and valuable stone under the surface of the land
Subject to Section 8 Mining Act 1971 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)
Subject to Section 168A Coal Mines Act 1925 (affects Sections 98, 101 and 103 Block III Cromwell Survey District)
Lot 2 on DP 33 0709 is subject to interests, easements and rights under the laws relating to Mining, Mines and Minerals.
Subject to a right to convey water over part Section 11 marked A DP 344529 over part Section 98 marked B DP 344529 and over part lot 2 DP 33 0709 marked C DP 344529 created by easement Instrument 6264801.4 - 23.12.2004 at 9:00 am
The easements created by Easement Instrument 6264801.4 are subject to Section 243 (a) Resource Management Act 1991
Subject to a right to convey water over part marked A, B and C on DP 344 529 created by Easement Instrument 7073932.4 - 17.10.2006 at 9:00 am
10402937.1 CAVEAT BY AURORA ENERGY LIMITED - 19.4.2016 at 11:11 am

Historic Owners

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QuickMap Title Details



Information last updated as at 02 Jul 2018

COMPUTER FREEHOLD REGISTER DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT106/99
Land Registration District Otago
Date Issued 23 July 1895

Prior References

WA 3/8

Type Fee Simple
Area 23.4718 hectares more or less
Legal Description Section 54 Block III Cromwell Survey District

Proprietors

Leyser Brothers Limited

The abovementioned land is subject to interests, easements and rights under the Land relating to mining, mines and minerals 5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

The information provided on this report forms a guideline only. As a result, Custom Software Limited cannot and does not provide any warranties or assurances of any kind in relation to the accuracy of the information provided through this report, the Site and Service. Custom Software Limited will not be liable for any claims in relation to the content of this report, the site and this service.

QuickMap Title Details Historic Information



Information last updated as at 02 Jul 2018

COMPUTER FREEHOLD REGISTER DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT106/99
Land Registration District Otago
Date Issued 23 July 1895

Historic Memorials

The abovementioned land is subject to interests, easements and rights under the Land relating to mining, mines and minerals

412496 Mortgage to Bank of New Zealand - 19.10.1973 at 2:41 pm

5067301.1 Discharge of Mortgage 412496 - 3.8.2001 at 10:41 am

5067301.2 Transfer to Leyser Brothers Limited - 3.8.2001 at 10:41 am

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

7606318.1 Departmental Dealing adjusting the area and title diagram following investigation of Crown Water Races -
7.11.2007 at 9:05 am

Historic Owners

LEYSER BROTHERS LIMITED JOHANNES THEODORUS WILHELMUS LEYSER TREVOR JOSEPH LEYSER

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QuickMap Title Details



Information last updated as at 02 Jul 2018

COMPUTER FREEHOLD REGISTER DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT7C/632
Land Registration District Otago
Date Issued 12 September 1978

Prior References

OT73/239 OT7C/630

Type Fee Simple
Area 113.0835 hectares more or less
Legal Description Section 27-28, 96, 99, 102 Block III Cromwell Survey District

Proprietors

Leyser Brothers Limited

Sections 96, 99 and 102 are Subject to Section 8 Mining Act 1971
Sections 96, 99 and 102 are Subject to Section 168A Coal Mines Act 1925
5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

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QuickMap Title Details Historic Information



Information last updated as at 02 Jul 2018

COMPUTER FREEHOLD REGISTER DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT7C/632
Land Registration District Otago
Date Issued 12 September 1978

Historic Memorials

Sections 96, 99 and 102 are Subject to Section 8 Mining Act 1971

Sections 96, 99 and 102 are Subject to Section 168A Coal Mines Act 1925

412496 Mortgage over Sections 27 and 28 to Bank of New Zealand - 19.10.1973 at 2:41 pm

5067301.1 Discharge of Mortgage 412496 - 3.8.2001 at 10:41 am

5067301.2 Transfer to Leyser Brothers Limited - 3.8.2001 at 10:41 am

5067301.3 Mortgage to Bank of New Zealand - 3.8.2001 at 10:41 am

7606318.1 Departmental Dealing adjusting the total area and title diagram of Section 28 Block III Cromwell SD following investigation of Crown Water Races - 7.11.2007 at 9:05 am

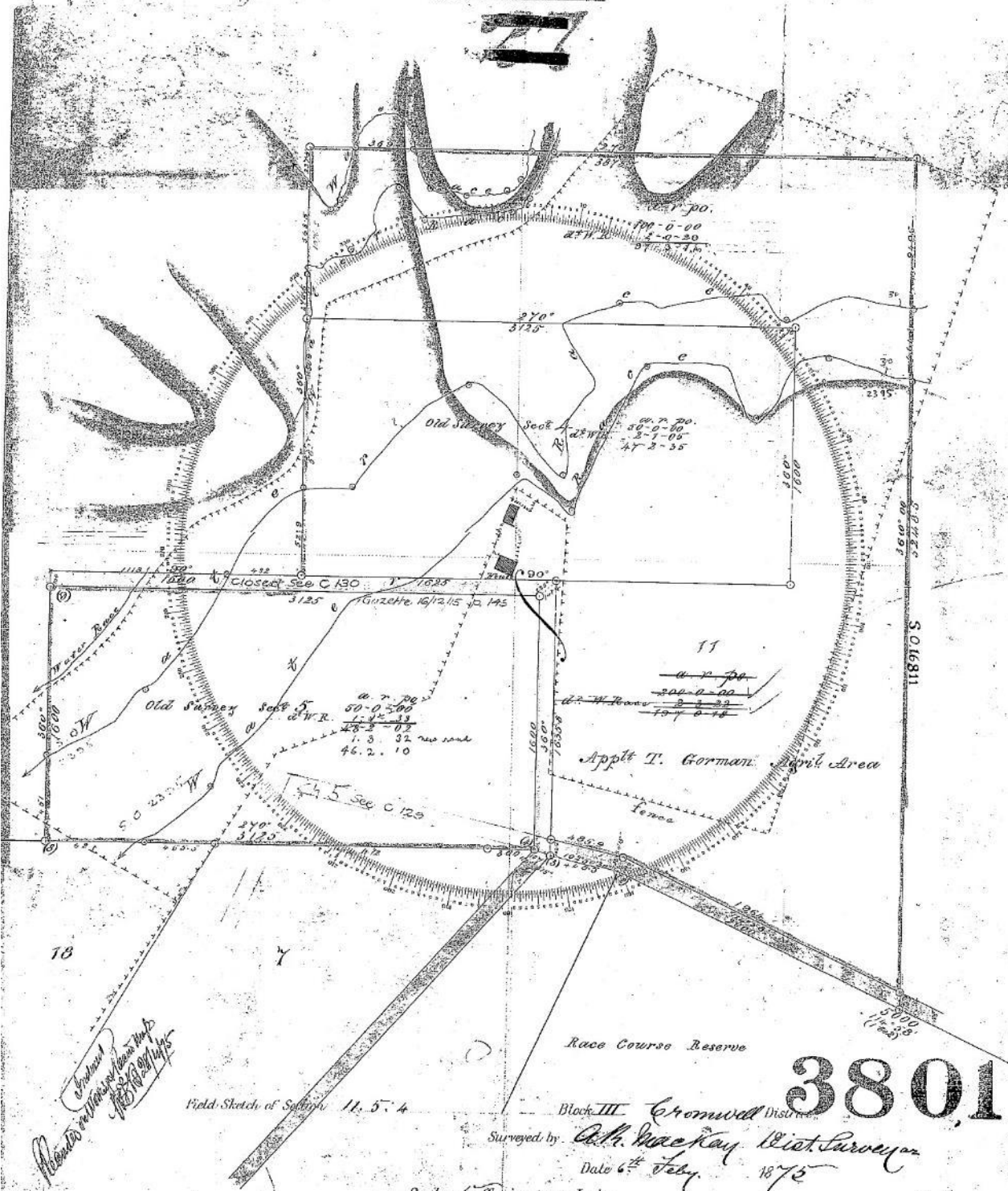
Historic Owners

LEYSER BROTHERS LIMITED JOHANNES THEODORUS WILHELMUS LEYSER TREVOR JOSEPH LEYSER

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Survey Department of Otago.

Drawn from



*Obtained in the office of the Survey Department
 1875*

Field Sketch of Section 11, 5, 4

Race Course Reserve

3801

Block III Cromwell District

Surveyed by *Col. MacKay* Dist Surveyor

Date *6th Feb* 1875

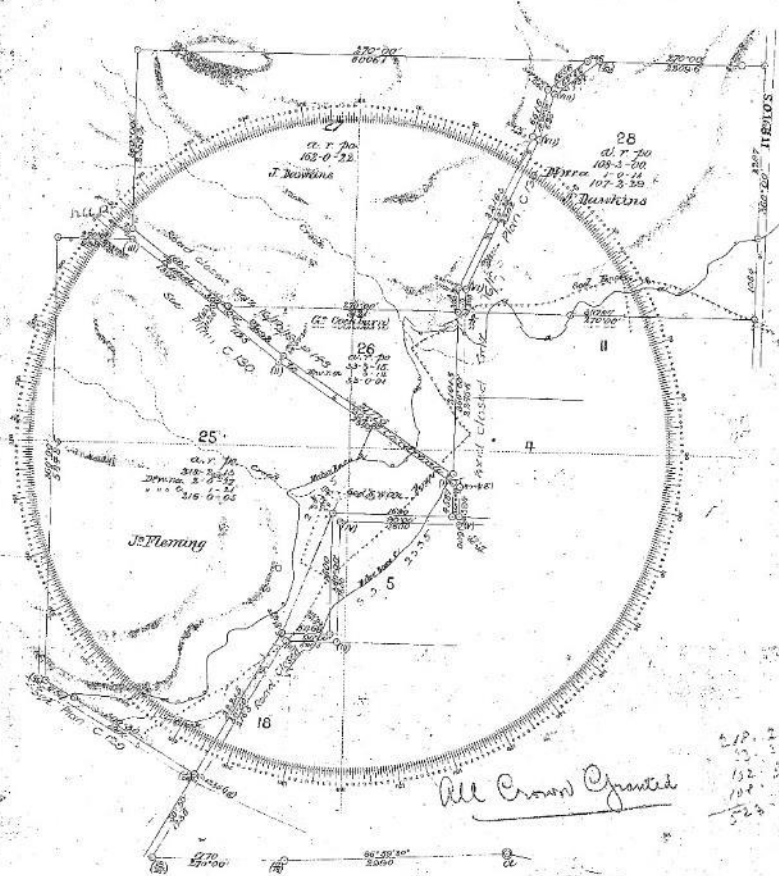
Scale *3 Chains to an Inch*



M
11/5/75
(Handwritten signature)



General Survey Department of New Zealand
Provincial District of Otago



218 2 13
132 3 28
102 3 28
523 3 28

All Crown Granted

F.B. 422, 20-34

Field Sketch of Sections 25, 26, 27, 28.

Block II Cromwell District
Surveyed by A. A. Mackay Dist. Surveyor
Date 17th July 1878.

3815

J. A. B. B.
F.B. 422 Page 30-34
T.B. 8 Page 191.

3815

Vol. 178 fol 254.
- 177 - 122.

Plan of

PART OF SECTIONS 5 AND 25 BLOCK III
CROMWELL SURVEY DISTRICT

F. J. Williams - Surveyor

JUNE 1914

Scale 3 Chains to an Inch

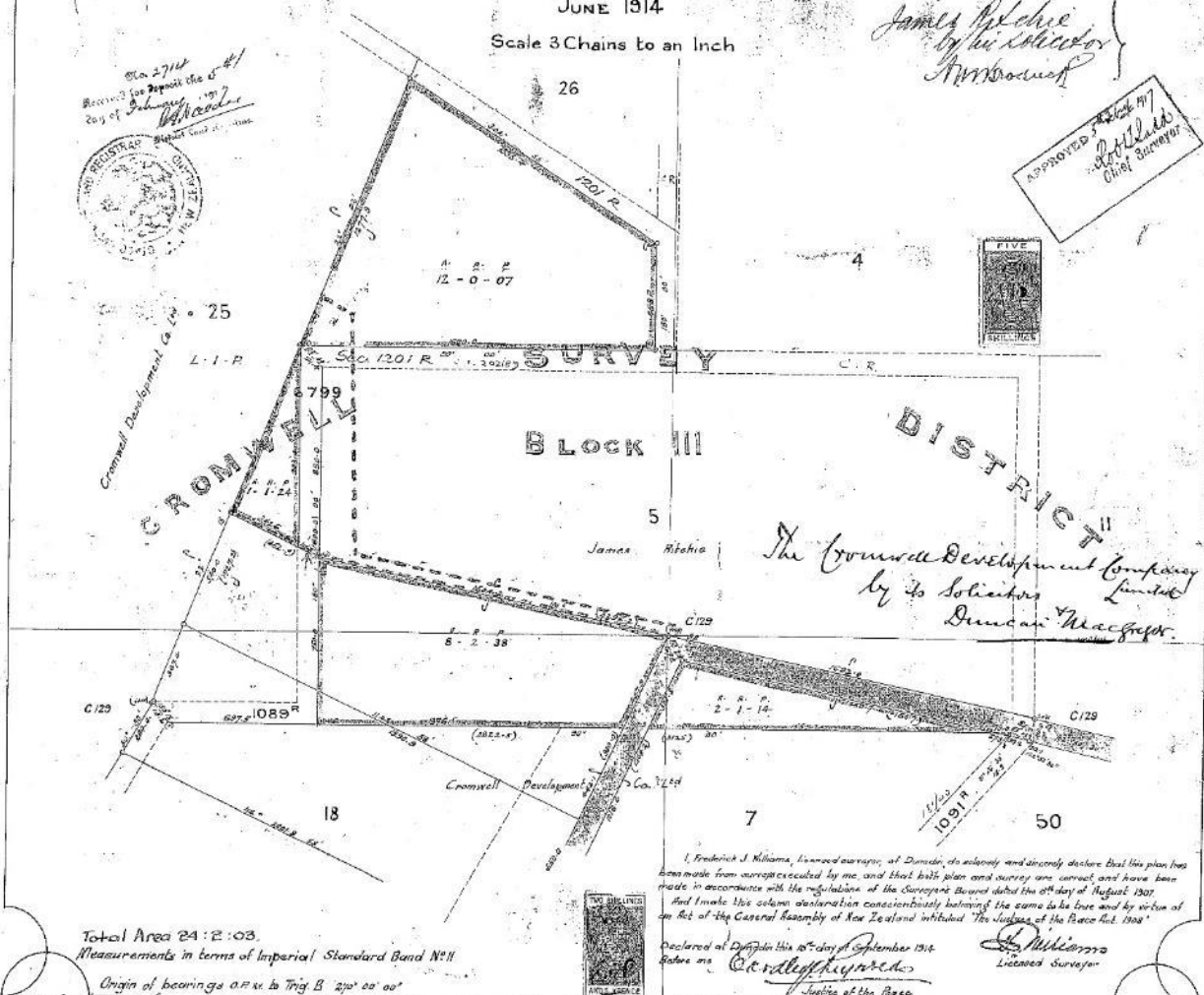
RECEIVED: 27/1/14
EXAMINED: 1/2/14
TRAV. BOOK: Q PAGE 36
FIELD BOOK: 5245 PAGE 105
REF. PLANS: 2800 C129, Working Plan

Recorded on L.T. Record Map. Q.R.

John Fleming
by his Solicitor
Amos B.
James Reddie
by his Solicitor
Amos B.

APPROVED: 27/1/14
Robt. Laid
Chief Surveyor

2714
Records for Section 5 & 25
20y of Suburbs
Whitcomb
District Council



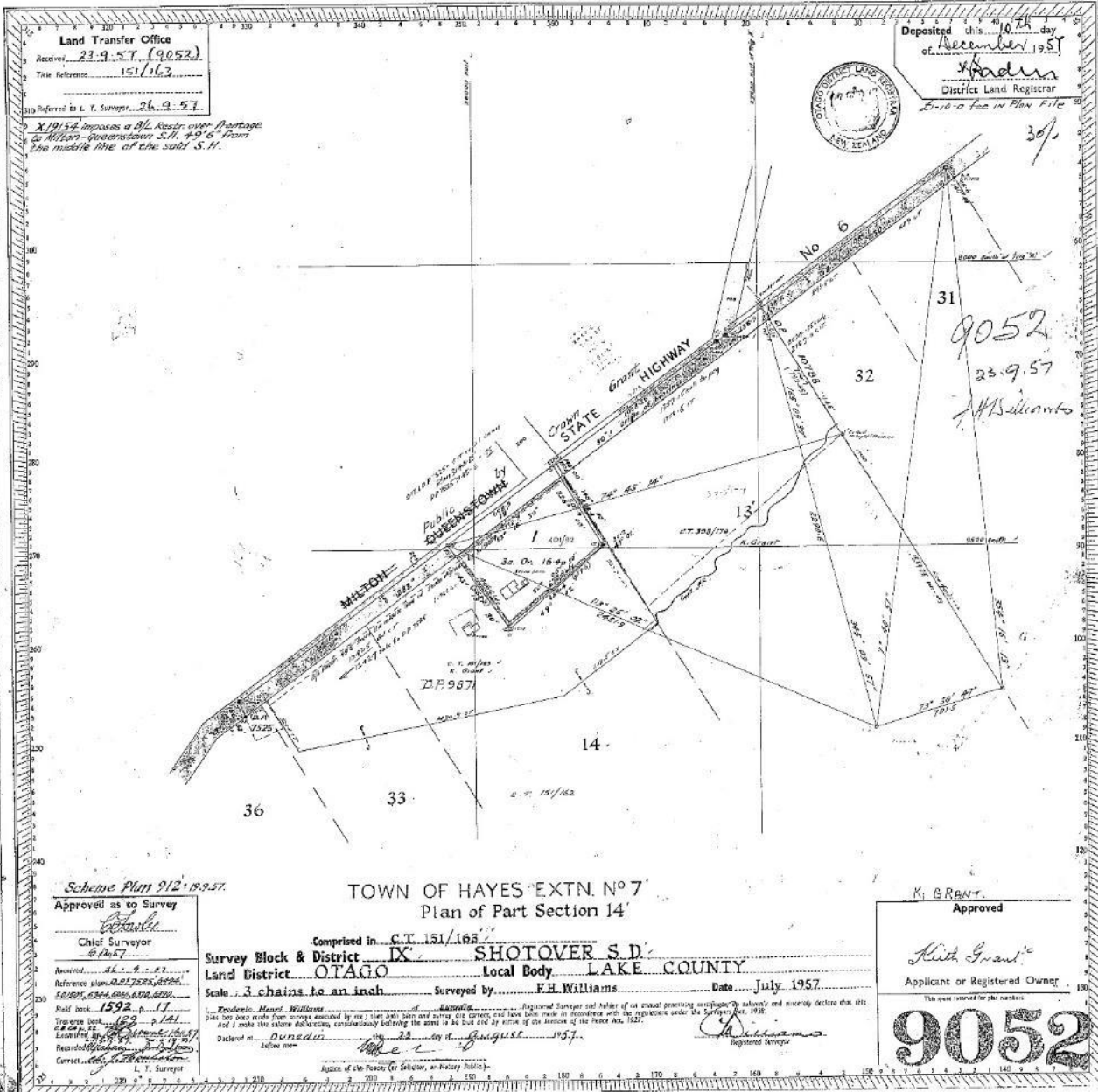
The Cromwell Development Company Limited
by its Solicitors
Duncan Macgregor

Total Area 24 : E : 03.
Measurements in terms of Imperial Standard Band No. 11
Origin of bearings as per to Trig B 270° 00' 00"

I, Frederick J. Williams, Licensed Surveyor, of Dunedin, do solemnly and sincerely declare that this plan has been made from surveys executed by me, and that both plan and survey are correct and have been made in accordance with the regulations of the Surveyors Board dated the 8th day of August 1907, and I make this solemn declaration conscientiously believing the same to be true and by virtue of an Act of the General Assembly of New Zealand intituled 'The Statute of the Peace Act 1908'

Declared at Dunedin this 27th day of September 1914
before me
C. S. McPherson
Justice of the Peace
F. J. Williams
Licensed Surveyor

2714



Land Transfer Office
 Received 23.9.57 (9052)
 Title Reference 151/163
 Approved as to Survey 26.9.57

Deposited this 10th day
 of December 1957
 at Auckland
 District Land Registrar
 This is the Plan File

X 19154 imposes a DL Restr. over Partage
 to Wilson - Queenstown S.D. 4916 from
 the middle line of the said S.H.

Scheme Plan 912.19.57
 Approved as to Survey

Chief Surveyor
 Received 26.9.57
 Reference plan 421/220, 422/220, 423/220, 424/220, 425/220, 426/220, 427/220, 428/220, 429/220, 430/220, 431/220, 432/220, 433/220, 434/220, 435/220, 436/220, 437/220, 438/220, 439/220, 440/220, 441/220, 442/220, 443/220, 444/220, 445/220, 446/220, 447/220, 448/220, 449/220, 450/220, 451/220, 452/220, 453/220, 454/220, 455/220, 456/220, 457/220, 458/220, 459/220, 460/220, 461/220, 462/220, 463/220, 464/220, 465/220, 466/220, 467/220, 468/220, 469/220, 470/220, 471/220, 472/220, 473/220, 474/220, 475/220, 476/220, 477/220, 478/220, 479/220, 480/220, 481/220, 482/220, 483/220, 484/220, 485/220, 486/220, 487/220, 488/220, 489/220, 490/220, 491/220, 492/220, 493/220, 494/220, 495/220, 496/220, 497/220, 498/220, 499/220, 500/220, 501/220, 502/220, 503/220, 504/220, 505/220, 506/220, 507/220, 508/220, 509/220, 510/220, 511/220, 512/220, 513/220, 514/220, 515/220, 516/220, 517/220, 518/220, 519/220, 520/220, 521/220, 522/220, 523/220, 524/220, 525/220, 526/220, 527/220, 528/220, 529/220, 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TOWN OF HAYES EXTN. NO 7
 Plan of Part Section 14

Comprised in C.T. 151/163
 Survey Block & District IX SHOTOVER S.D.
 Land District OTAGO Local Body LAKE COUNTY
 Scale 3 chains to an inch Surveyed by F.H. Williams Date July 1957

K. GRANT
 Approved
 Applicant or Registered Owner

9052

I, F. H. Williams, Registered Surveyor and holder of an annual practicing certificate, do solemnly and sincerely declare that this plan has been made from surveys conducted by me; that the plan and survey are correct and have been made in accordance with the requirements under the Survey Act, 1938. And I make this solemn declaration conscientiously believing the same to be true and by virtue of the Statute in that behalf made.
 Declared at DUNEDIN this 23rd day of August 1957.
 F. H. Williams
 Registered Surveyor

Agent of the Peace (or Solicitor, or Notary Public)

Land Transfer Office

Received 14/2/1960
Title Reference 9871/55

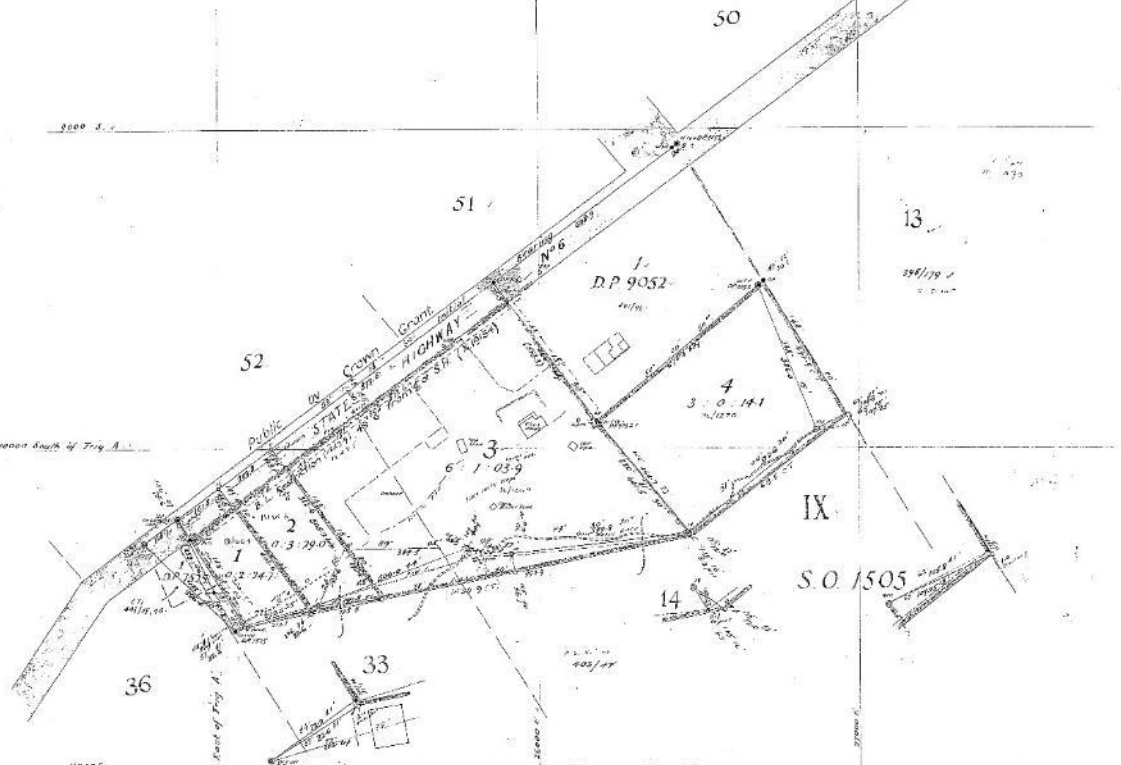
Referred to L. T. Surveyor 23/9/1960
X.1954 imposes B.L. Restriction

Total Area 10 3 317

Deposited this 14th day
of February 1960



Registered
District Land Registrar



Scheme Plan 1069 4/8/60

Approved as to Survey
Chief Surveyor

Received 14/2/60
Reference plan 9871/55
Field book 1884 p. 28 & 29
Topping book 140 p. 98 & 99
Examined by
Recorded by
Corrected by

TOWN OF HAYES EXTN No 10
Subd. of parts of Sections 14 & 33,

Comprised in C.T. 49/118

Survey Block & District IX, SHOTOVER S.D.
Land District OTAGO Local Body LAKE COUNTY

Scale 2 chains to an inch Surveyed by F.H. Williams Date Feb. 1960

I, Frederick Henri Williams, Registered Surveyor, do hereby and sincerely declare that this plan has been made from correct and accurate data and that I have taken all reasonable precautions to ensure its accuracy and that I am not aware of any errors or omissions in it.

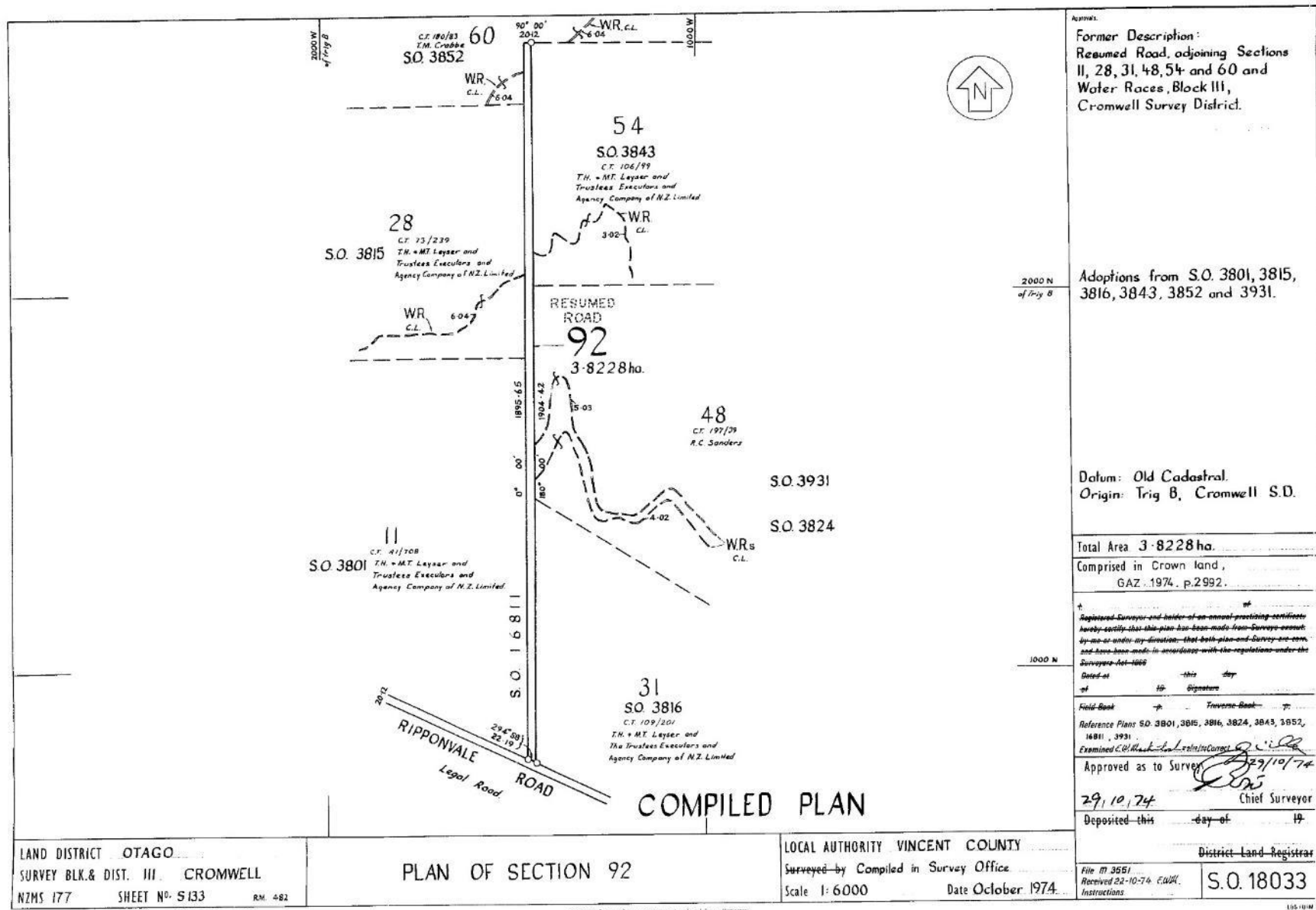
Declared at Wellington on 15th day of Feb. 1960
F.H. Williams
Registered Surveyor

Approved

John James

Applicant or Registered Owner

9871



Former Description:
 Resumed Road, adjoining Sections
 II, 28, 31, 48, 54 and 60 and
 Water Races, Block III,
 Cromwell Survey District.

Adoptions from S.O. 3801, 3815,
 3816, 3843, 3852 and 3931.

Datum: Old Cadastral.
 Origin: Trig B, Cromwell S.D.

Total Area 3-8228 ha.
 Comprised in Crown land,
 GAZ. 1974. p.2992.

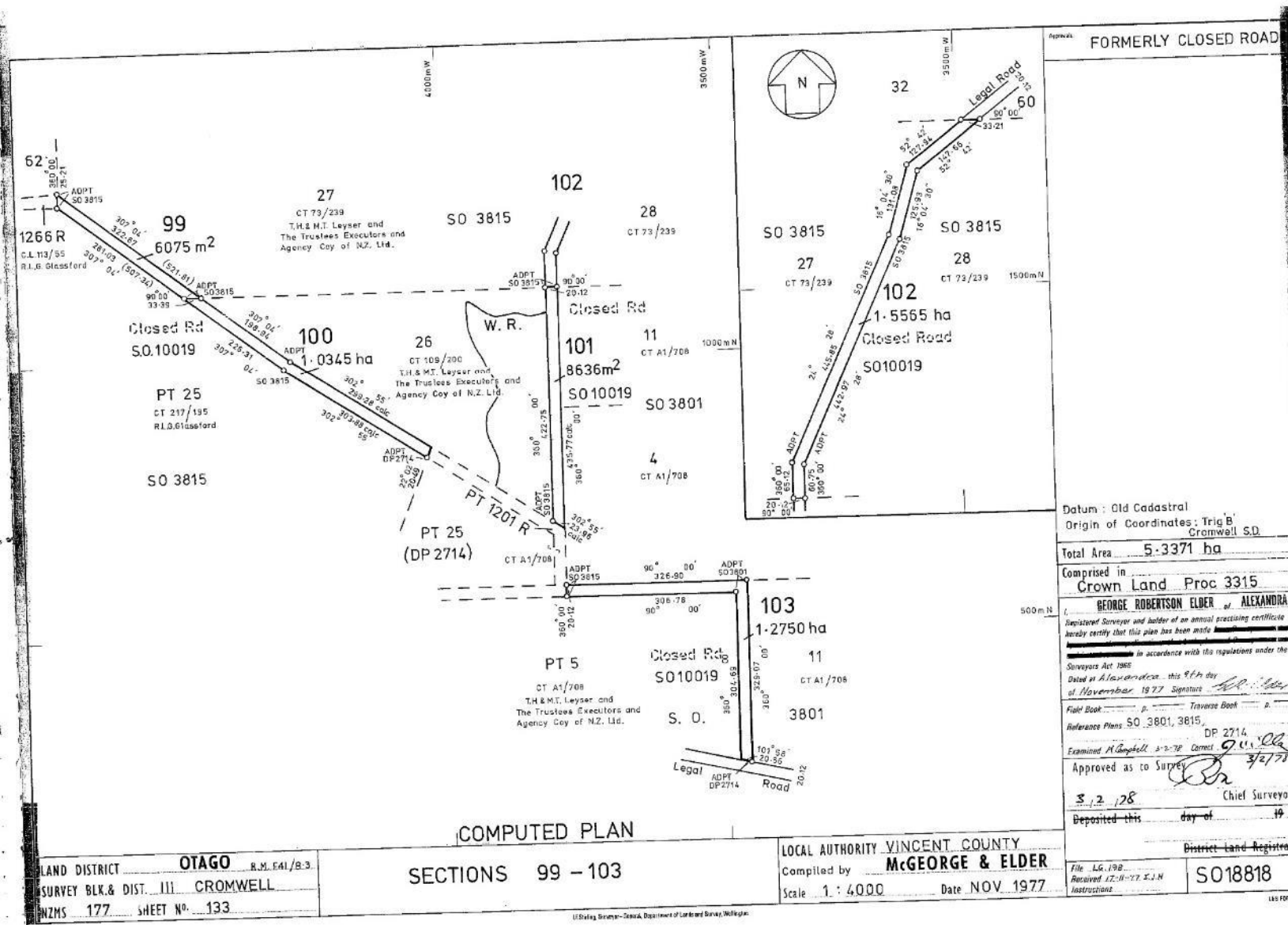
Registered Surveyor and holder of an annual practicing certificate
 hereby certifies that this plan has been made from surveys executed
 by me or under my direction that both plan and survey are true,
 and have been made in accordance with the regulations under the
 Surveyors Act 1966

Dated at this day
 of 1974 by Signature

Field Book of Traverse Book

Reference Plans S.O. 3801, 3815, 3816, 3824, 3843, 3852,
 3881, 3931
 Examined C. G. Mackenzie District Registrar
 Approved as to Survey 29/10/74
 29, 10, 74 Chief Surveyor
 Deposited this day of 1974
 District Land Registrar

File M 3651
 Received 22-10-74 E.W.R.
 Instructions S.O. 18033



Approval: **FORMERLY CLOSED ROAD**

Datum: Old Cadastral
Origin of Coordinates: Trig B
Cromwell S.D.

Total Area **5.3371 ha**

Comprised in
Crown Land Proc 3315

GEORGE ROBERTSON ELDER of **ALEXANDRIA**
Registered Surveyor and holder of an annual practicing certificate
herby certify that this plan has been made in accordance with the regulations under the
Surveyors Act 1985
Dated at **Alexandria** this **9th** day
of **November** 1977 Signature *[Signature]*

Field Book _____ p. Traverse Book _____ p.

Reference Plans: SO 3801, 3815, DP 2714

Examined **H Campbell** 1-2-78 District **9.11.1978**

Approved as to Survey *[Signature]* 3/2/78

S. J. 1978 Chief Surveyor

Deposited this _____ day of _____ 19____

District Land Registrar

File **LG.198**
Received **LG.19-27.5.19**
Instructions

SO18818

LAND DISTRICT **OTAGO** R.M. E41/B.3
SURVEY BLK. & DIST. **III CROMWELL**
NZMS **177** SHEET No. **133**

LOCAL AUTHORITY **VINCENT COUNTY**
Compiled by **McGEORGE & ELDER**
Scale **1 : 4000** Date **NOV. 1977**

SECTIONS **99 - 103**

© Every Survey—State, Department of Land Survey, Wellington

LS FORM 11



9 July 2018

Dear Lisa,

Thank you for your enquiry regarding information that the Otago Regional Council may hold regarding potential soil contamination at the properties indicated below:

Address	Valuation Number / Legal Description
144 and 112 Ripponvale Road	Section 27 Block III Cromwell SD Section 102 Block III Cromwell SD Section 26 Block III Cromwell SD Section 101 Block III Cromwell SD Part RUN 1201R Part Section 25 Block III Cromwell SD Lot 2 DP 330709 Section 103 Block III Cromwell SD Section 28 Block III Cromwell SD Section 11 Block III Cromwell SD Part Section 5 Block III Cromwell SD Section 98 Block III Cromwell SD Section 54 Block III Cromwell SD Section 96 Block III Cromwell SD Section 4 Block III Cromwell SD

The Otago Regional Council maintains a database of properties where information is held regarding current or past land-uses that have the potential to contaminated land. Land-uses that have the potential to contaminate land are outlined in the [Ministry for the Environment's Hazardous Activities and Industries List \(HAIL\)](#).

Where investigation has been completed, results have been compared to relevant soil guideline values. The database is continually under development, and should not be regarded as a complete record of all properties in Otago. The absence of available information does not necessarily mean that the property is uncontaminated; rather no information exists on the database. You may also wish to examine the property file at the relevant City or District Council to check if there is any evidence that activities occurring on the HAIL have taken place.

I can confirm that:

The above land does not currently appear on the database; however, aerial photographs indicate that parts of the site are used for horticultural purposes, which may be associated with persistent pesticide storage or use. Aerial photographs also show the presence of stockyards, which may be associated with sheep dips.

If your enquiry relates to a rural property, please note that many current and past activities undertaken on farms may not be listed on the database, as they can be more difficult to identify. Activities such as use, storage, formulation, and disposal of pesticides, offal pits, landfills, animal dips, and fuel tanks have the potential to contaminated land.

Similarly, the long-term use of lead-based paints on buildings can, in some cases, cases cause soil



contamination. The use of lead-based paint is generally not recorded on the database.

Please feel free to contact me if you have any other enquires, or you would like to discuss the matter further,

Regards,

A handwritten signature in black ink, appearing to read "SBL", written over a horizontal line.

Simon Beardmore
Senior Environmental Officer

The enclosed/attached information is derived from the Otago Regional contaminated land register and is being disclosed to you pursuant to the Local Government Official Information and Meetings Act 1987. This information reflects the Otago Regional Council's current understanding of this site, which is based solely on the information obtained by the Council and held on record. It is disclosed only as a copy of those records and is not intended to provide a full, complete or entirely accurate assessment of the site. Accordingly, the Otago Regional Council is not in a position to warrant that the information is complete or without error and accepts no liability for any inaccuracy in, or omission from, this information. Any person receiving and using this information is bound by the provisions of the Privacy Act 1993.

Our reference: A742759

Consent No. RM14.291.01

WATER PERMIT

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Leyser Brothers Limited

Address: Shannon Farm, RD 2, Cromwell

To take and use ground water for the purpose of irrigation, frost fighting, stock water, domestic water and firefighting

For a term expiring 1 April 2050

Location of Point of Abstraction:

Cromwell, approximately 630 metres west northwest of the intersection of Ripponvale Road and Kawarau Gorge Road (State Highway 6)

Legal Description of land at point of abstraction:

Sec 11 Blk III Cromwell SD

Legal Description of land (s) where water is to be used: Lot 2 DP 330709 and section 4, 11, 98, 101 and 103 Block III Cromwell SD and Part Section 5, 25 Block III Cromwell SD and Part Run 1201R. (All 126180). Sec 27 — 28, 96, 99 102 Block III Cromwell SD. (All OT72/632) Section 54 Block III Cromwell SD. (OT106/99). other land as advised in writing to the Consent Authority

Map Reference at point of abstraction: NZTM 2000 E1298377 N5005718

Conditions

Specific

1. If this consent is not given effect to within a period of two years from the date of commencement of this consent, this consent shall lapse under section 125 of the Resource Management Act 1991.
2. (a) The rate of abstraction shall not exceed 30 litres per second;
(b) 2,592 cubic metres per day per day;
(c) 77,760 cubic metres per month;
(d) 699,840 cubic metres between 1 July in a year and 30 June in the following year
3. This permit shall be exercised or suspended in accordance with any Council approved rationing regime that applies to the Cromwell Terrace Aquifer.
4. (a) During the period 1 May and 31 August in any calendar year the taking of water for the purpose of irrigation authorised by this consent shall cease; and
(b) At all other times the taking of water for the purpose of irrigation authorised by this consent shall cease when:



- (i) The combined flow levels in the following rivers are below 250 cubic metres per second:
- Clutha River at Cardrona (NIWA Hydrological Recording Site No. 75282) plus 10 cubic metres per second, less the mean Hawea River flow as measured at the Camp Hill (NIWA Hydrological Recording Site No. 75287); and
 - Kawarau River at Chards Road (NIWA Hydrological Recording Site No. 75262); and
 - Nevis River at Wentworth (NIWA Hydrological Recording Site No. 75265); and
 - Manuherikia River at Ophir (NIWA Hydrological Recording Site No. 75253); and
- (ii) The level of Lake Hawea is at or below 338.2 metres above datum (based on a 3 hour rolling average), as measured at Hawea Dam Site (NIWA Hydrological Recording Site No. 75288).

Performance Monitoring

5. (a) The consent holder shall install a water meter to record the water take, within an error accuracy range of +/- 5% over the meter's nominal flow range, and a telemetry compatible datalogger with at least 24 months data storage and a telemetry unit to record the rate and volume of take, and the date and time this water was taken.
- (b) The datalogger shall record the date, time and flow in litres per second.
- (c) Data shall be provided once daily to the Consent Authority by means of telemetry. The consent holder shall ensure data compatibility with the Consent Authority's time-series database.
- (d) The water meter shall be installed in a straight length of pipe, before any diversion of water occurs. The straight length of pipe shall be part of the pump outlet plumbing, easily accessible, have no fittings and obstructions in it. There shall be a straight length of pipe on either side of the water meter: on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of 5 times the diameter of the pipe.
- (e) The consent holder shall ensure the full operation of the water meter, datalogger and telemetry unit at all times during the exercise of this consent. All malfunctions of the water meter and/or datalogger and/or telemetry unit during the exercise of this consent shall be reported to the Consent Authority within 5 working days of observation and appropriate repairs shall be performed within 5 working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within 5 working days of the completion of repairs.



(f) The installation of the water meter, datalogger and telemetry unit shall be completed to full and accurate operation prior to the exercise of the consent. The consent holder shall forward a copy of the installation certificate to the Consent Authority within one month of installing the water meter datalogger and telemetry unit.

(g) (i) If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the first exercise of this consent.

(ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the first exercise of this consent.

(iii) Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be completed and submitted to the Consent Authority with receipts of service within 5 working days of the verification being performed, and at any time upon request.

General

6. The consent holder shall take all practicable steps to ensure that:
 - (a) there is no leakage from pipes and structures;
 - (b) the use of water is confined to targeted areas;
 - (c) there is no run off of irrigation water in irrigated areas either on site or off site.

7. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent for the purpose of imposing aquifer restriction levels, if and when an operative regional plan sets aquifer restriction levels.

8. Copies of the results of any water quality analyses performed on the groundwater shall be forwarded to the Consent Authority within two weeks of the analysis being undertaken.

9. Following the fifth anniversary of this consent, the Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within 3 months of each anniversary of the commencement of this consent for the purpose of:
 - (a) adjusting the consented rate or volume of water under condition 2, should monitoring under condition 5 or future changes in water use indicate that the consented rate or volume is not able to be fully utilised; or
 - (b) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; or
 - (c) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Otago Regional Policy Statement; or;



- (d) adjusting or altering the method of water take data recording and transmission.
- (e) To require greater efficiency of water use and/or further steps that may be required to ensure consistency with Condition 8 of Discharge Permit 2001.394.

Notes to Consent Holder

1. *If you require a replacement permit upon the expiry date of this permit, any new application should be lodged at least 6 months prior to the expiry date of this permit. Applying at least 6 months before the expiry date may enable you to continue to exercise this permit until a decision is made, and any appeals are resolved, on the replacement application.*
2. *The water meter, datalogger and telemetry unit should be safely accessible by the Consent Authority and its contractors at all times.*
3. *The consent holder must note that Plan Change 6A of the Regional Plan Water requires the control of farm contaminants in runoff and leaching of nutrients to groundwater. If such discharges are managed such that the thresholds in schedule 16A are not met by 1 April 2020 then consent will be required for the discharge of contaminants. Information about on farm nutrients must also be kept as of May 2014 for providing inputs to OVERSEER version 6 which models leaching of nutrients to groundwater. For other information about obligations under Plan Change 6A refer to the ORC website.*

Issued at Dunedin this 17th day of April 2015.

Reissued at Dunedin this 12th day of April 2018 to reflect a correction to the legal description of land (s) where water is to be used.

Christopher P. Shaw
Manager Consents



Appendix C

Site Photographs

144 Ripponvale Road, Cromwell

Appendix C Site Photographs

Aerial Photos (taken 22/3/18)



Aerial photo of eastern side of site and adjacent cherry orchard



Western part of site with Ripponvale Rd in foreground



Northern section of site showing orchards on hillside



Looking East across site with orchards in foreground, farm buildings in centre and livestock paddocks (Cromwell town in distance)



Central area of site showing packing sheds, disposal pits (circled) and deposited materials



Area indicated to contain buried wire

Central area of site showing area of buried wire below storage tanks and open waste pit adjacent to building



Open waste pit



Open offal pit with previous pits to left (disturbed ground) and disused cars



Tyre store in centre of picture



Orchards on northern hillside

Site Inspection Photos (23/3/18)



Pesticide storage shed



Above ground diesel storage tank



Disused diesel drum in undergrowth



General materials with disused fuel storage tank



Disposal pit within area of machinery storage



Half full diesel drums within machinery store shed



Pesticide spray machinery along with batteries on pallet in foreground



Pesticides stored within shed



Area where buried wire and steel located



Location of buried fuel storage tank



Machinery storage shed



Entrance drive to site office (right) and residential dwelling beyond



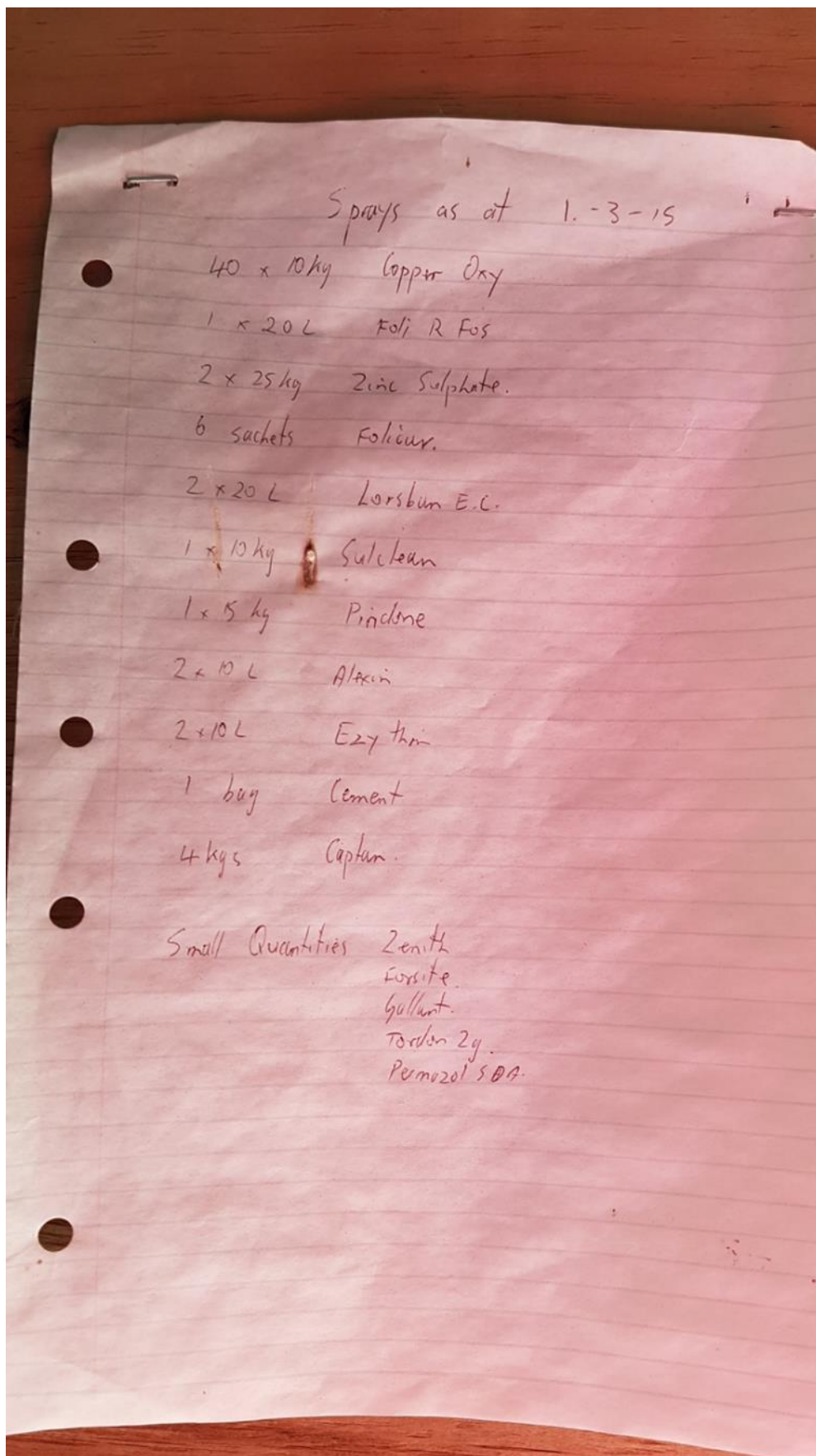
Machinery storage and water tank adjacent to packing shed

Appendix D

List of Pesticides used on Site

144 Ripponvale Road, Cromwell

Appendix D List of Pesticides used on Site



WSP | OPUS

www.wsp-opus.co.nz