Soil Contamination Risk

Stage 1 Preliminary Site Investigation Report Revision 1

Mr. D J Anderson

311 Trents Road • Prebbleton P16845

June 2013



DAVIE LOVELL SMITH

PLANNING SURVEYING ENGINEERING



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1 Executive Summary

The subject site is located in Prebbleton, 12.7km southwest of Christchurch. There is a proposal to rezone the land and subsequently subdivide the land prior to being developed for use as rural residential sections. This will change the use of the land and disturb soils.

The objective is to determine whether there is any risk of potential contamination of the soil that would warrant further investigation. The scope of the work has included all requirements for a Stage 1 preliminary site investigation report.

The subject site has been used generally for horse breeding and pastoral farming purposes since 1900s and in recent times (since at least 1982) as a horse training facility/stud. Prior to the 1980s, it is believed that there was little, if any, use of agrichemicals on the land, based on local knowledge of the farming practices of the owner at that time. Since the 1980s, the use of agrichemicals has been limited to well known, non-persisting products such as "round-up".

The preliminary site investigation has found that the presence of a small aboveground diesel storage tank has the potential to have contaminated the land. It is recommended that further investigation around the diesel storage tank be conducted. There is low risk of contamination for the remaining land, for which it is recommended that further investigation is not warranted.

2 Objectives of the Investigation

This report has been prepared for the purposes of rezoning and subsequent subdivision consent and future associated earth disturbing and building activities related to that subdivision, and has been completed in accordance with the Ministry for the Environment's "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand". The objective is to determine whether there is any risk of potential contamination that would warrant further investigation. This is one of the methods described in Section 6(3) of the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Health) Regulations 2011 (NES) to establish whether the regulations apply.

3 Scope of Work Undertaken

This report includes all requirements for a Stage 1 preliminary site investigation report, detailing the work undertaken to assess the risk of potential contamination of the soil, and has been completed in accordance with the Ministry for the Environment's "Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand".

The scope of the work undertaken has included:

- Review of Selwyn District Council property information provided in a LIM and on property files
- Obtaining ECan data from the Listed Land Use Register (LLUR)
- Review of ECan GIS data
- Review of 4 historic aerial photos from circa 1940 to current
- Review of historical ownership history
- Review of local knowledge of site history
- Site visit
- Preparation of report in accordance with MfE guidelines



4 Site Identification

The site is located at 311 Trents Road, Prebbleton, Christchurch. It is legally described as Lot 2 DP 51743, with a total area of 9.2ha. A location plan is attached as **Appendix A**. Certificates of Title are included in **Appendix B**.

5 Activity Description

This report is limited to the following proposed activities as described and indicated on the attached subdivision plan in **Appendix C.**

- Rezoning the land as rural residential
- Future residential subdivision and use of the land for residential or recreational purposes
- Earth disturbing activities associated with the development of the subdivision and future buildings

6 Site Condition and Surrounding Environment

The site is generally flat and slopes slightly to the southeast. It contains a residential dwelling and a number of other buildings predominantly used as stables. A large horse training track occupies the northern and eastern part of the site. Established shelter belts and fences divide the site into smaller paddocks and specific use areas.

The site is bounded on the south/ southwest by Trents Road and to the west by Shands Road. To the north is agricultural land and to the east the land is used as rural residential.

A small block adjacent to the eastern boundary has been identified on the LINZ orchard layer (Copy in **Appendix F**) as having been used in the past as an orchard. The site has been used as an olive orchard since the early 2000's. An established shelter belt of large, tall trees along the property and a driveway, approximately 8m wide, exists between the site boundary and the location of the olive orchard. A 2004 aerial indicates the edge of the tree crown at that time was approximately 20m from the boundary and that the shelter belt crown was approximately 8m wide.

The land is currently zoned as Rural. It is proposed to rezone this land as Living 3 – Rural Residential. Generally the surrounding land has mixed use as agricultural and rural residential.

7 Site Visit

A site visit was carried out and the following points were noted:

- The buildings on the site include stables and farm buildings for storage of feed and horse racing equipment, as well as farm machinery.
- An above ground fuel tank was located at the eastern corner of the training track.
- It was noted the site is well maintained and kept very clean and tidy.
- Use and storage of agrichemicals under current ownership were discussed. The owner stated that the use of agrichemicals is limited to well known, products such as "roundup", which are stored in a safe and proper manner on a concrete slabs in covered buildings.
- History of the site was discussed with current owners.



8 Site History

8.1 Sources of Information Used in Assessment

- Aerials (sourced from LINZ, NZ Aerial Mapping and Google Maps)
- LINZ Mapping Layers Orchard Layer
- ECan LLUR Statement and GIS records
- Selwyn District Council LIM
- Geotechnical Report (311 Trents Road, Prebbleton, Canterbury geotechnical assessment for subdivision consent by Riley Consultants, Dec 2012)

8.2 Previous Site Ownership and Use

Historic Certificates of Title were searched and the following history was able to be recorded:

- 1948 Owned by A.J. Halkett, farmer
- 1948 to 1987 Owned by Grice family, farmers
- 1987 to present D.J. Anderson and S.J. Anderson, current owners

8.3 District Council Records

The LIM and property files held for the property were reviewed and the following information was recorded:

- Various building permits from 1987 1988 for erecting stables, hay barn and a dwelling
- 2009 resource consent for subdivision

8.4 Regional Council Records

The ECan Listed Land Use Register Statement does not list the site and does not identify any sites within 100m as a nearby site of interest or investigation.

The site is over an unconfined/semi confined aquifer system. A well (M36/3775) exists on the site located between the dwelling and the stables.

8.5 Local knowledge of site

The current owners of the site advise that the above ground fuel tank, noted on the site visit, has been in place for approximately 8 years, with an approximate capacity of 400 litres. It has never been sited anywhere else on the property. No other potential risk areas were identified.

The current owners also state that the previous owners, the Grice family - horse breeders, were locally known for not using agrichemicals as the farm was overrun with weeds. To their knowledge, the land has been solely used historically for horse breeding/training.

An olive orchard exists on the adjacent site.

8.6 Historical Uses of Adjacent Land

A small block adjacent to the eastern boundary has been identified on the LINZ orchard layer as being used since the early 2000s as an orchard.

The surrounding land appears to have been in rural use.



8.7 Review of Historical Aerial Photographs

A total of four aerial photos (see copies in **Appendix E**) have been used to assess the historical use of the site as detailed below:

- The earliest photo reviewed is from 1965, sourced from NZ Aerial Mapping Ltd. The scale of the photo is 1:16000 which makes detail difficult to discern. The use of the subject land appears to be general pasture/grazing. There are no buildings on-site.
- A photo from 1973 also sourced from NZ Aerial mapping, is at a more readable scale of 1:5000. It shows that there has been no change in use of the site.
- A photo from 2000/01 (sourced from LINZ) shows a horse training track, stables and associated buildings, and a dwelling.
- A photo from 2004 (sourced Google Maps) shows an orchard on the adjacent site to the east.

8.8 Geology and Hydrology

The site is over the semi confined or unconfined aquifer system and ground water levels measured in the onsite well indicate the groundwater level is approximately 7-11m deep. The soils are described as Templeton moderately deep and deep loam silts, and Templeton deep fine sandy loams on sand. The direction of ground water flow is generally in a southeasterly direction.

8.9 Hazardous Activities and Industries List (HAIL)

The Hazardous Activities and Industries List (HAIL) compiled by The Ministry for the Environment include the following categories (*in italics*) that could be associated with the historical use of horse breeding/training, with a summary of the associated activities below.

- A Chemical manufacture, applications and storage
 - 1. Agrichemicals including commercial premises used by spray contractors for filling, storing or washing out tanks for agrichemical application
 - 17. Storage tanks or drums for fuel, chemicals or liquid waste

Current use as a horse training facility and the original use as a farming block for pasture and horse breeding have associated uses of agrichemicals.

An aboveground diesel storage tank is present on site.

- G Cemeteries and waste recycling, treatment and disposal
 - 6. Waste recycling or waste or wastewater treatment

There are two septic tanks on site. One serves the residential dwelling and the other serves the stables. Where required, these will be removed in accordance with Council requirements.



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

The LLUR statement (copy in **Appendix D**) does not identify any nearby sites or investigations in the vicinity of the subject site.

Since the early 2000's, the adjacent land to the east of the site of interest has been used as an olive orchard. Orchards have associated activities listed under HAIL. Activities on the adjacent orchard have the potential to give rise to migration of contaminants to the subject site.

8.10 Possible Types of Contaminants Associated With Past Use

Possible types of contaminants associated with activities carried out onsite are detailed in the table below:

Activity	Possible types of contaminants associated	
Use of agrichemicals	OCP ₁ ; Heavy Metals	
Diesel storage tank	TPH ₂ ; Heavy Metals; PAH ₃ ; Btex ₄	
Olive Orchard	OCP; Heavy Metals	

Note 1: Organochlorine Pesticides

Note 2: Total Petroleum Hydrocarbons

Note 3: Polycyclic Aromatic Hydrocarbons

Note 4: Benzene, Toluene, Ethylbenzene and Xylenes

9 Discussion and Site Characterisation

With the previous and current use of grazing on a large portion of the site over an extended period it is possible that the soil may have been subjected to irrigation, fertilisation and pesticide application at low levels. The use of agrichemicals is likely to have only been in place since the 1980s. The agrichemicals used are unlikely to contain contaminants that persist in the soil and were stored in a safe and proper manner on a concrete slabs in covered buildings. The normal use of these chemicals does not generally give rise to contamination levels of concern.

The existing farm buildings have all been constructed in the late 1980's which is after the time that the use of persistent agrichemicals and the common use of lead paint ceased. On the site visit it was evident that the farm buildings and surrounding concrete pads and yard areas were all very well maintained and clean. There was no evidence of fuel storage in or around the farm buildings and the owner advised that refueling occurred in the eastern corner where the diesel tank is located. Therefore it is considered that the risk of soil contamination with persistent chemicals or fuels is unlikely to have occurred in and around the farm buildings.

The adjacent land identified as an orchard in the LINZ orchard layer was used as an olive orchard since the early 2000's. (Copy in **Appendix F**) Olives are generally relatively resistant to pests and disease in New Zealand. If sprays were used on this orchard, they were likely to have been modern copper based sprays which do not persist in the environment. The shelter belt on the site boundary will have provided a barrier to any spray drift. Due to the orchard being established many years after the last permitted use of the types of chemical sprays that persist in the environment, the recent use as an olive orchard, and the significant shelter belt and



distance between the trees and the adjacent site, it is considered highly unlikely that migration of contaminants will have occurred.

The use of an above ground fuel storage tank poses the risk of minor leakages or spillages during refueling. This use has the potential to contaminate the soils below and around the tank. There is potential for contamination of the soil under and around the tank, where spillages or leaks may have occurred. Further investigation is recommended, to determine the levels, if any, of contamination of the soil associated with the fuel storage tank.

10 Recommended Further Investigation

The area below and around the above ground diesel tank should have further investigations carried out including soil sampling. The plan included in **Appendix C** identifies the area that should have further investigations carried out.

11 Conclusions

The investigations undertaken have revealed that the majority of the site is unlikely to have been used in a manner that would have resulted in soil contamination of concern; however the site has had a confirmed HAIL use carried out on it, with the use of an above ground diesel storage tank. The risk of contamination is limited to the area around the tank. A detailed site investigation will be required to determine the level and type of any contaminants present and the possible risks to human health and the environment. The site appears to be well maintained and it is therefore envisaged that the diesel storage tank was used in a proper and safe manner. If a detailed site investigation reveals soil contamination associated with the fuel storage tank, it is likely that this contamination would be minor and could be easily and economically remediated.

12 Planning Status

In terms of the NES the land is considered to be covered if:

"5(7)(c) it is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it."

The investigation has shown that an activity or industry described in the HAIL has been carried out on the site now or in the past and on this basis it is considered that the NES does apply to a small part of the site.

Section 8 of the NES describes the requirements for permitted activities. Section 8(4) Subdividing or changing use states:

"Subdividing or changing the use of the piece of land is a permitted activity while the following requirements are met:

- (a) A preliminary site investigation of the land or piece of land must exist;
- (b) The report on the preliminary site investigation must state that it is highly unlikely that there will be a risk to human health if the activity was done to the land;
- (c) The report must be accompanied by a relevant site plan to which the report is referenced;
- (d) The consent authority must have the report and the plan."



For Lot 4 of the proposed subdivision (see **Appendix C.**) this report cannot state that it is highly unlikely that there will be a risk to human health if the activity described in Section 3 was done to the land and accordingly cannot meet the requirements to be considered a permitted activity in terms of the NES for Assessing and Managing Contaminants in Soil to Protect Human Health. As a detailed site investigation does not yet exist the proposal will also not meet the controlled or restricted discretionary conditions and is therefore considered to be a discretionary activity.

It is recommended that further detailed investigation, including soil testing, be carried out on the site in the identified risk area shown on the plan in **Appendix C**.

For the remainder of the site this report states that it is highly unlikely that there will be a risk to human health if the activity described in Section 5 was done to the land, and accordingly meets the requirements to be considered a permitted activity in terms of the NES for Assessing and Managing Contaminants in Soil to Protect Human Health. The proposal is considered as a permitted activity for the site with the exception of Lot 4 of the proposed subdivision.

Report prepared by:

Kate Stafford BSc

Environmental Scientist

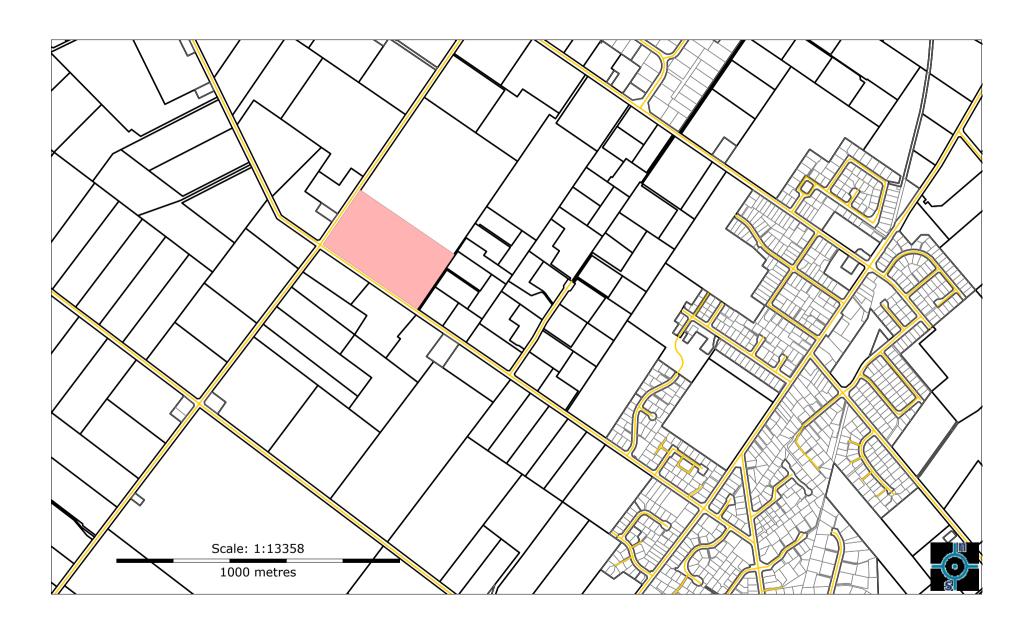
Report reviewed and certified by a suitably qualified and experienced practitioner as prescribed under the NES (soil):

Nicola Malloch CEnvP

Senior Environmental Engineer



Appendix A – Location Plan





NEW ZEALAND.

[SCHEDULE 1.

Reference: P.R. Vol90 folio 62
Transfer No.



Register-book, Vol. 512 , folio 169

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT.

•	This Certificate, dated the Seventh	day ofJ	uly one thousand nine	hundred and Forty-cight
	under the hand and seal of the District Land Registrar	of the Land Registre	ation District ofCante	rburybeing a Certificate in
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	is seized of an estate in fee-simple (subject to such reser	vations, restrictions, er	cumbrances, liens, and interests as a	re notified by memorial under written
	or endorsed hereon; subject also to any existing right of			
	in the land hereinafter described, as the same is delineate	ed by the plan hereon	bordered <u>green</u> , be the se	veral admeasurements a little more or
	less, which said land, is in the said Warrant expressed to i	ave been originally acc	puired by the said ALFRED JA	SS HALKETT
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A.L.R.

CAVEAT 685263/1 BY DAVID JOHN HUTTON and VALERIE MARGARET HUTTON (affects part) - 8.6.1987 at 11.44am

CeMANn.

Plan 51743 deported 2015/1987

No.697995/2 Compliance Certificate pursuant to Section 306(1)(f)(i) Local Government Act 1974 -20.8.1987 at 9.158m

A.L.R.

20.8.1987

OCT 697995/3 - Cancilled and new CsT 30B/234,235 issued for Lots 1 and 2 DP 51743 and σ new CT 30B/236 issued for balance herein

A.L.R.

CANCELLED DUPLICATE DESTROYED

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COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952



Search Copy

IdentifierCB30B/235Land Registration DistrictCanterburyDate Issued20 August 1987

Prior References

CB512/169

Estate Fee Simple

Area 9.2000 hectares more or less **Legal Description** Lot 2 Deposited Plan 51743

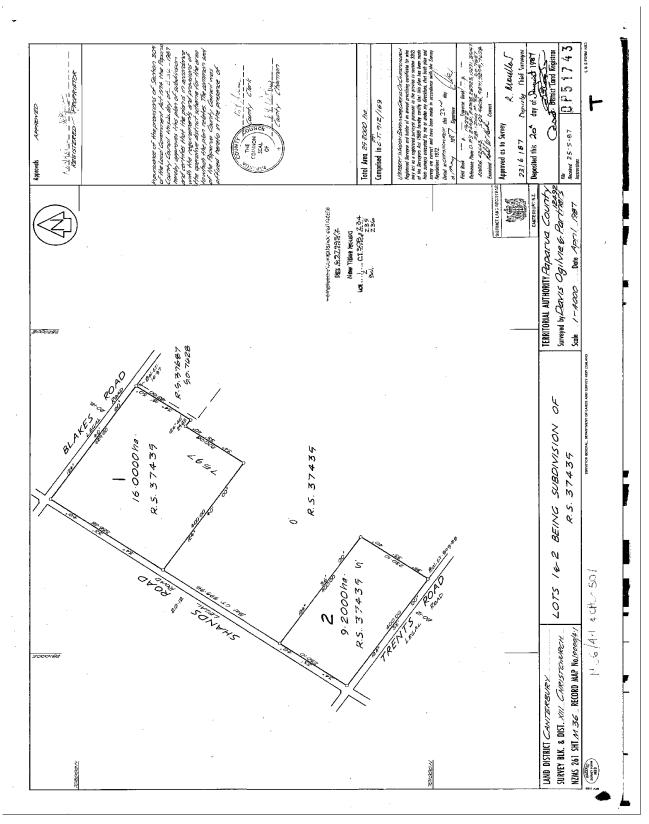
Proprietors

David John Anderson, Suzanne Joan Anderson and WF Trustees 2007 Limited

Interests

Subject to Section 206 Land Act 1924

7567280.3 Mortgage to Westpac New Zealand Limited - 1.11.2007 at 12:20 pm





COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952



Search Copy

Identifier CB30B/235
Land Registration District Canterbury
Date Issued 20 August 1987

Prior References

CB512/169

Estate Fee Simple

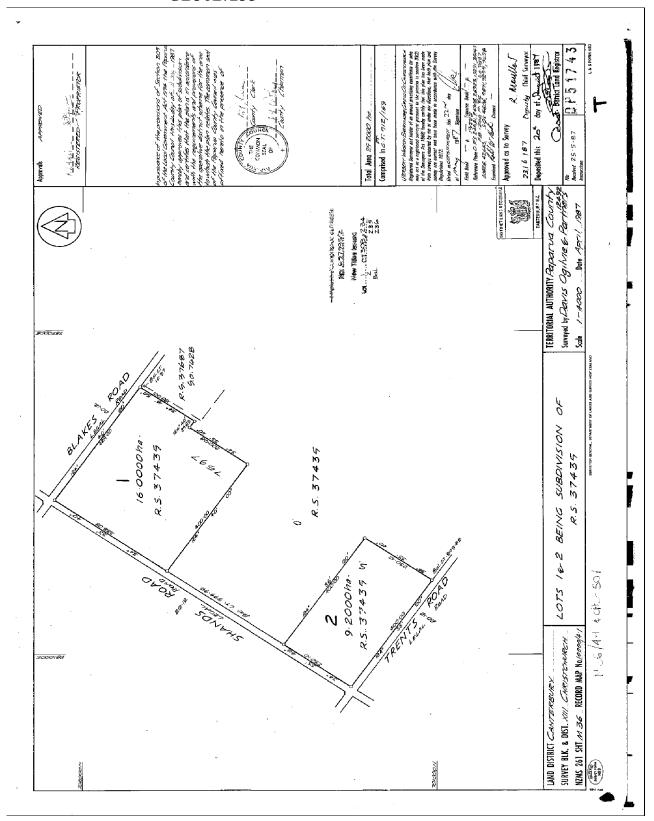
Area 9.2000 hectares more or less **Legal Description** Lot 2 Deposited Plan 51743

Proprietors

David John Anderson, Suzanne Joan Anderson and WF Trustees 2007 Limited

Interests

Subject to Section 206 Land Act 1924 7567280.3 Mortgage to Westpac New Zealand Limited - 1.11.2007 at 12:20 pm







AMENOMENTS:					
AMENDMENT	DATE	DESCRIPTION			
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- 1) Areas and dimensions are approximate and subject to final survey and deposit of plans.
- 2) Service easements to be created as required.
- 3) This plan has been prepared for subdivision concept purposes only. No liability is accepted if the plan is used for any other purpose.
- 4) Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.
- 5) This plan is subject to the granting of subdivision and/or resource consents and should be treated as a proposal until such time as the necessary consents have been granted by the relevant authorities.

Option D



DAVIE LOVELL SMITH

PLANNING SURVEYING ENGINEERING

79 Cambridge Terrace P O Box 679 Christchurch 1. New Zealand Telephone: 03 379-0793 Fax: 03 379-5664 E-mall: office@davlels.co.nz

Mr D J Anderson **Trents Road**

Possible Subdivision of Lot 2 DP 51743

P.16845

For Discussion Purposes

SCALE: 1:1000@A1 1:2000@A3 DATE: March 2013

CAD FILE: J:\16485\opti

RO

Appendix D – LLUR

Statement from the Listed Land Use Register



58 Kilmore Street, PO Box 345, Christchurch

General enquiries: 03 365 3828 Customer services: 03 353 9007 Fax: 03 365 3194

Email: ecinfo@ecan.govt.nz

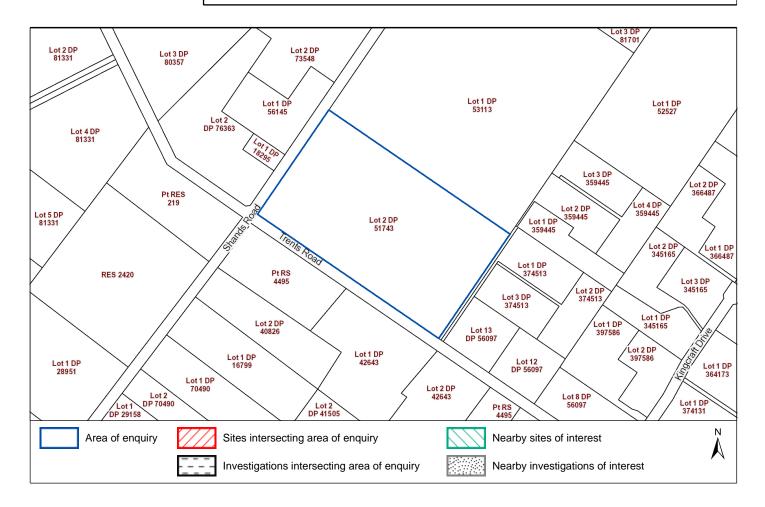
or: 0800 EC INFO (0800 324 636) Website: www.ecan.govt.nz

Date:

8 March 2013

• Lot 2 DP 51743 **Land Parcels:**

Valuation No(s): 2355204700



Summary of sites:

There are no sites associated with the area of enquiry.

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

For further information from Environment Canterbury, contact the Contaminated Sites Officer and refer to enquiry number 15566.

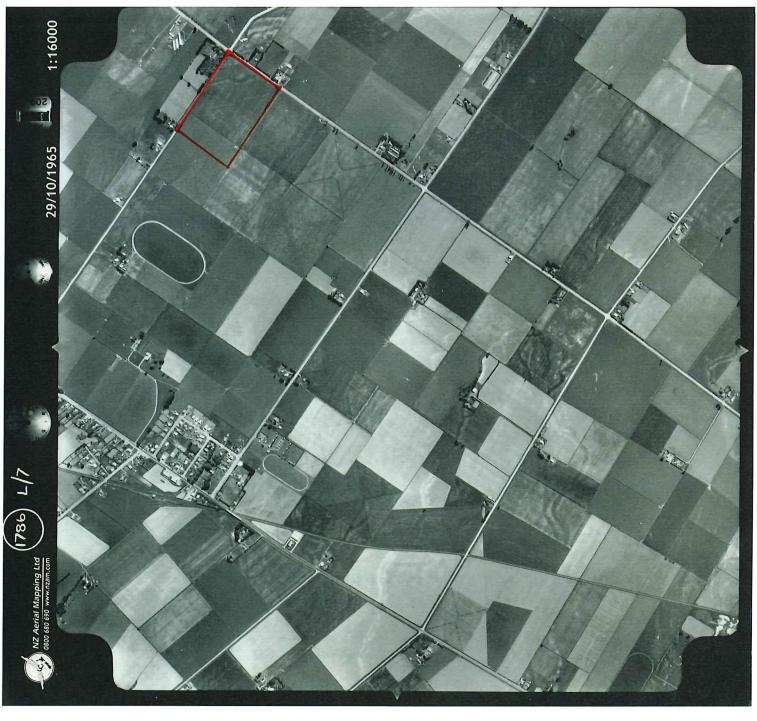
Disclaimer:

The enclosed information is derived from Environment Canterbury's Listed Land Use Register and is made available to you under the Local Government Official Information and Meetings Act 1987 and Environment Canterbury's Contaminated Land Information Management Strategy (ECan 2009).

This information reflects Environment Canterbury's current understanding of this site, which is based only on the information thus far obtained by it and held on record concerning this site. It is released only as a copy of those records and is not intended to provide a full, complete or totally accurate assessment of the site. As a result, Environment Canterbury 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.

Appendix E – Aerial Photos



Copyeright NZAM 2008





Capyleight NZAM 2008





Source Linz 2000/2001





Source LINZ Orchard Layer