Mcdonnell Road, Arrowtown
Landuse Change
Preliminary Site Investigation

For the

Arrowtown Lifestyle Retirement Village

October 2015

Davis Consulting Group Limited
Arrow Lane,
Arrowtown 9302
03 409 8664
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Landuse Change

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EXECUTIVE SUMMARY

The Arrowtown Lifestyle Retirement Village project team are preparing an application for the Special Housing Accord for a retirement village south of Arrowtown in the Wakatipu Basin, Queenstown. Historically, the property has been used as farmland. Agrichemicals associated with farming operations are included on the Hazardous Activities and Industries List (HAIL) and may have been applied to the site. Given the proposed landuse change and the possibility that hazardous substances have been used to support agricultural activities, the site is subject to the provisions of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES).

In order to meet the requirements of the NES, the Arrowtown Lifestyle Retirement Village project team commissioned Davis Consulting Group Limited (DCG) to undertake a Preliminary Site Investigation (PSI) to review the landuse history of the site, identify any potential contaminant risks and consider the risk to human health from the establishment and habitation associated with the proposed residential land use.

The scope of work completed during the PSI included the following:

- Review of the site history;
- Discussions with the site owner;
- Completion of a site inspection to examine the condition of the property;
- Collection of soil samples from 9 locations across the proposed area of development to characterise heavy metal and pesticide concentrations in surface soils that may be associated with broad acre application of fertilisers and pesticides; and
- Based on research into the activities on the site and soil quality results, consideration of the risk to human health that may be associated with the proposed landuse change of the site; and
- Preparation of a PSI report in accordance with the requirements of the Contaminated Land Management Guidelines (CLMG) No. 1.

Based on the findings of the PSI, the following conclusions are made:

- Historically the property has been used for used for loading planes with fertilisers for topdressing within the airstrip area and, in the remaining areas for agricultural purposes and may have received persistent pesticide and fertilizer applications;
- Current activities that occur on the site includes cattle grazing and an airstrip. The owner has confirmed that fuel containers and bulk fertilizers were not stored on site;

- Agricultural infrastructure on site is limited to cattle yards in the north eastern corner beside Mcdonnell Road. The airstrip has a hanger and associated storage sheds;
- The site is subject to the provisions of the NES due to the history of agricultural activities that are associated with the handling and application of agrichemicals included on the Hazardous Activities and Industries List (HAIL);
- Based on the Contaminated Land Management Guidelines Schedule B and our review of the activities that have occurred at site, the potential hazardous substances that may be present include a range of heavy metals and pesticides associated with;
    - broad acre application of persistent pesticides and fertilisers; and the
    - handling and storage of fertilisers in and around the hanger area of the airstrip.
- The site and neighbouring properties are zoned rural general. Surrounding land use include golf courses and rural residential property;
- Searches of the Otago Regional Council's "Database of Selected Landuses" did not find any records of contaminated sites on the study site;
- No organochlorine pesticides were detected in analysis of soils taken from the site;
- Heavy metal concentrations detected were all below the adopted guideline values and appear to largely represent background concentrations;
- DCG considers it is highly unlikely that concentrations of contaminants within the soil associated with broadacre application of fertilisers and pesticides would be present at concentrations that will exceed contaminant standards for a rural residential land use scenario;
- DCG recommend further soil investigation in and around the hanger and associated area of the airstrip to assess possible soil contamination from heavy metals and pesticides that may have resulted from handling of fertilisers.

In summary, the PSI has identified historical land use activities that may have impacted the soil quality of the site. Based on the results of this Preliminary Site Investigation, DCG concludes it is highly unlikely that there is a risk to human health from the establishment of a residential development and the site is fit for activities consistent with the rural residential landuse scenario set out in the NES

1.0 INTRODUCTION

1.1 Purpose

The Arrowtown Lifestyle Retirement Village Project team are preparing an application for the Special Housing Accord for a retirement village south of Arrowtown in the Wakatipu Basin, Queenstown. Historically, the property has been used as farmland. Agrichemicals associated with farming operations are included on the Hazardous Activities and Industries List (HAIL) and may have been applied to the site. Given the proposed landuse change and the possibility that hazardous substances have been used to support agricultural activities, the site is subject to the provisions of the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES).

In order to meet the requirements of the NES, the Arrowtown Lifestyle Retirement Village Project team commissioned Davis Consulting Group Limited (DCG) to undertake a Preliminary Site Investigation (PSI) to review the landuse history of the site, identify any potential contaminant risks and consider the risk to human health from the establishment and habitation associated with the proposed residential land use.

DCG's experience in the provision of contaminated land services is provided in Appendix A.

1.2 Scope of Work

The scope of work completed during the PSI included the following:

- Review of the site history;
- Discussions with the site owner;
- Completion of a site inspection to examine the condition of the property;
- Collection of soil samples from 9 locations across the proposed area of development to characterise heavy metal and pesticide concentrations in surface soils that may be associated with broad acre application of fertilisers and pesticides; and
- Based on research into the activities on the site and soil quality results, consideration of the risk to human health that may be associated with the proposed landuse change of the site; and
- Preparation of a PSI report in accordance with the requirements of the Contaminated Land Management Guidelines (CLMG) No. 1.

1.3 Limitations

The findings of this report are based on the Scope of Work outlined above. DCG performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental science profession. No warranties, express or implied, are made.
Subject to the Scope of Work, DCG's assessment is limited strictly to identifying the risk to human health based on the historical activities on the site. The confidence in the findings is limited by the Scope of Work.

The results of this assessment are based upon site inspections conducted by DCG personnel, information from interviews with people who have knowledge of site conditions and information provided in previous reports. All conclusions and recommendations regarding the properties are the professional opinions of DCG personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, DCG assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside DCG, or developments resulting from situations outside the scope of this project.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location

The site is located 1.8 km south of Arrowtown centre, south of Mcdonnell Road in the Wakatipu Basin, Arrowtown and is legally described as Lot 5 DP 26714, certificate of title OT18D/341. The site is situated 2.12 km northeast of Lake Hayes and 800 m west of the Arrow River (see Figure 1).

Central coordinates for the site are 2181913.8 E 5574821.9 N (NZMG)

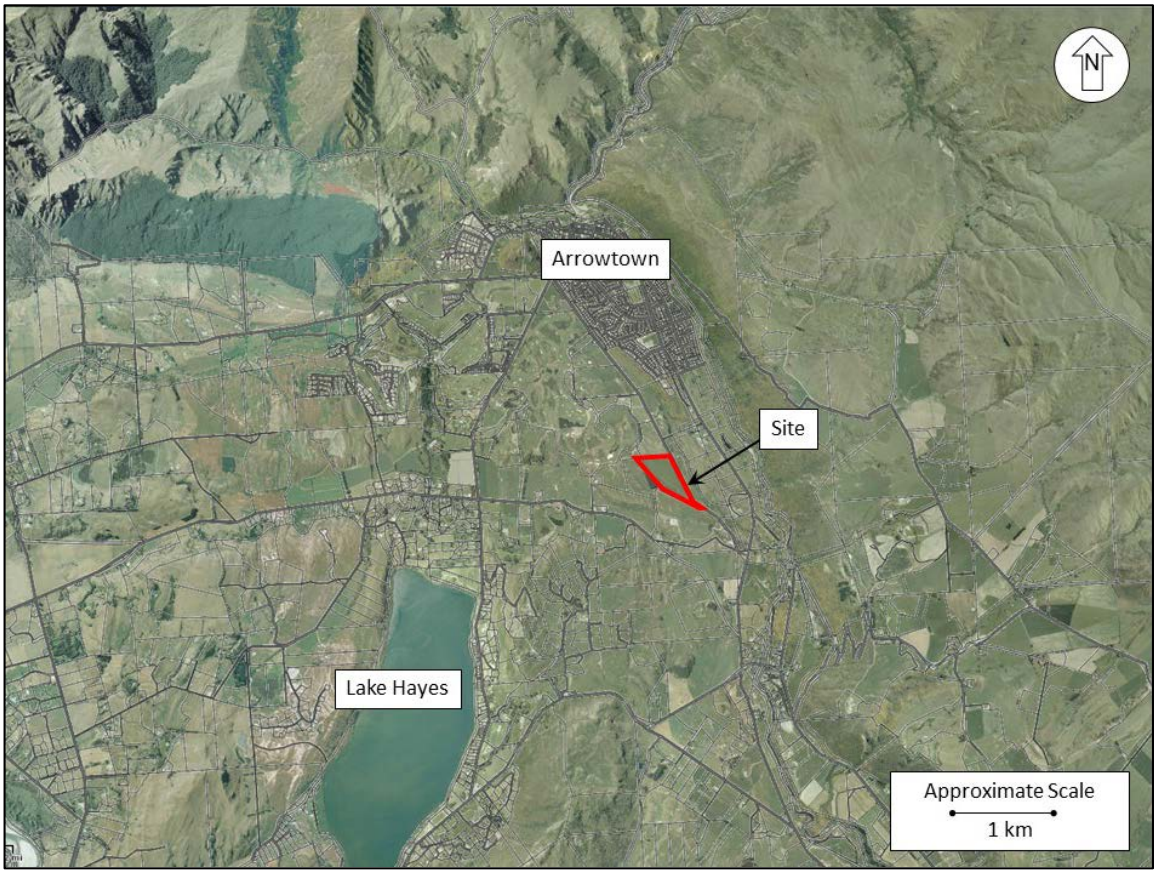

Figure 1: Site location plan *(QLDC webmaps, 2015)*

The Arrowtown Lifestyle Retirement Village proposal comprises an area of approximately 12 ha within Lot 5 DP 26714. The proposed development concept plan is shown in Figure 2.

Figure 2: Proposed Lifestyle Retirement Village Plan *(provided by, Momentum Projects Ltd)*

2.2 Site History

Historical references describe the first use of the land as sheep grazing as part of the Wakatipu Basin run leased from 1860 by W.G. Rees and then as part of Coronet Peak Station. The property was developed as the Merryfield farm in the early 1900s. Merryfield was then purchased by William Mutter around 1920. Mutter's son sold the farm to the Summers in the late 1940's (McDonald, 2010). There is no description of farming practices at Merryfield in McDonald (2010), however surrounding farming included dairy including Pleasant View (north), Bob Jenkins (east) and Bakers Farm (south). Historical photography from 1960 shows the site prior to the establishment of the airstrip and yards with no obvious buildings or structures (see Figure 3).

The land was purchased by Roger Monk in 1964. Prior to this, the land was grazed by sheep and cattle as Nueter Farm. Monk continued to graze sheep and established an airstrip and aircraft hanger in the late 1970's. Aircrafts were fuelled from small transportable drums. Flights from the airstrip included fertiliser application. Bulk fuel and bulk fertilizers were not stored on site (Monk, pers comm 2015). Roger Monk established a set of stock yards on the north eastern perimeter beside Mcdonnell Road around 2003 (see Figure 4). These yards were established to manage animals and were not used for application of pesticides or other animal treatment (Monk, pers comm 2015). Other than the stock yards, there is no evidence of present or historical agricultural infrastructure or animal management areas within the investigation site.

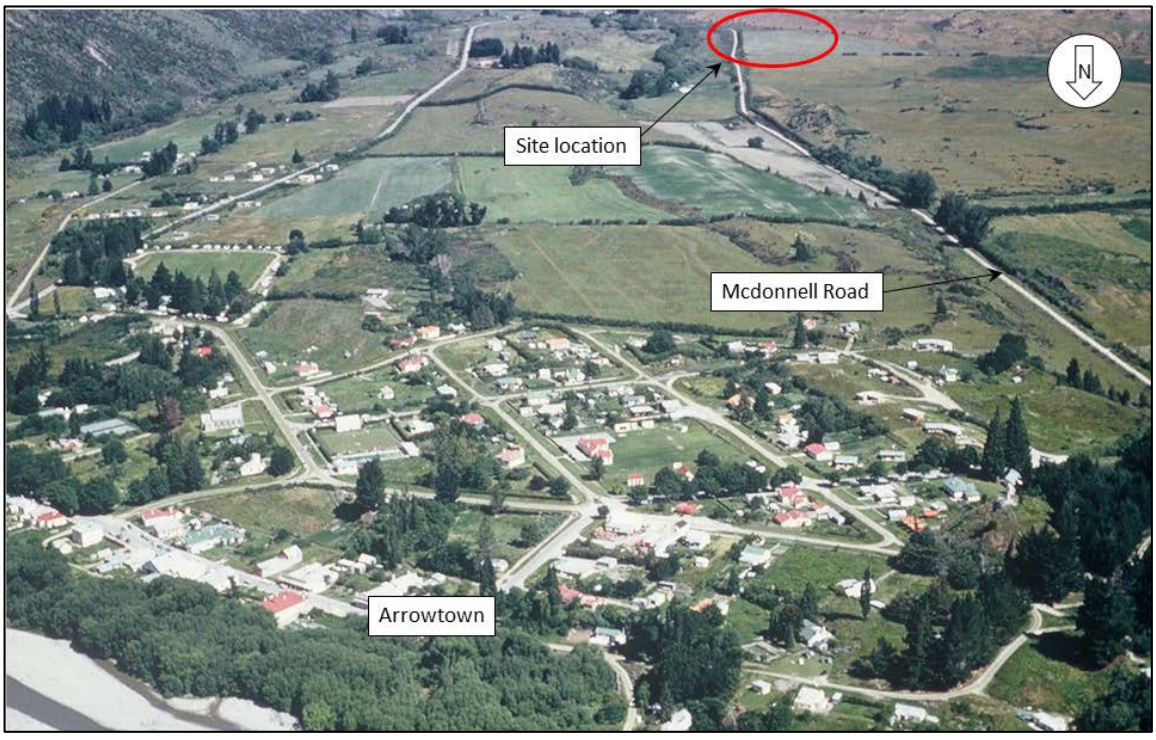

Figure 3: Landscape photograph of site and surrounds approx.1960
(provided by Lakes District Museum archives, 2015)

Current and historical certificate of titles for the site are provided in Appendix B.

Currently, the land is used for cattle grazing in the north and east sections, and as an airstrip in the central section. Stock yards continue to be used to manage animals prior to transport (see Figure 4).

2.2.1 Contaminants Commonly Associated with the Landuse

Based on the Contaminated Land Management Guidelines Schedule B, the potential hazardous substances that may be present include a range of heavy metals and pesticides associated with;

- broad acre application of persistent pesticides and fertilisers; and the
- handling and storage of fertilisers in and around the hanger area of the airstrip.

2.3 Additional Site Information

The CLMG No 1 requires information associated with fuel storage facilities, spill loss history, recorded discharges and onsite and offsite disposal locations. DCG requested a search of the Otago Regional Council (ORC) records for Landuse and Site Contamination Status, Resource Consents, and Resource Management Act (RMA) incidents for the site. The ORC stated that:

There are no records held on the Otago Regional Council's "Database of Selected Landuses" for the above site. The database identifies sites where activities have occurred that are known to have the potential to contaminate land. The record of a property in the database does not necessarily imply contamination. Similarly, the absence of available information does not necessarily mean that the property is uncontaminated; rather no information exists on the database.

Reference should be made to the Ministry for the Environment's Hazardous Activities and Industries List. If any of these activities have occurred on the above site, then it may be considered potentially contaminated. Topographic maps show that the site contains an air strip. Rural airstrips were commonly associated with bulk fertiliser storage for loading top dressing planes, and the site may have been used for HAIL category A6.

There is no information for these sites on spill/loss history, on or off-site disposal locations, or recorded discharges.

An interview with the site owner confirmed that while the airstrip was used for flights applying fertilisers, there was no long term bulk storage of fertiliser on site (see Section 2.2).

The following provides a summary of information that the CLMG No. 1 (MfE, 2003a) indicates should be included in a PSI report:

- Presence of Drums – No drums were recorded during the site visit.
- Wastes – No wastes were present on the site.
- Fill Materials – The only imported fill known to be present on site is within the southern section of the airstrip. This fill has been taken from a nearby road cutting (R. Monk pers comm., 2015).
- Odours – No odours were noted.
- Flood Risk – According to the QLDC hazard maps there are no natural hazards associated with the site.
- Surface Water Quality – No surface water was observed on site
- Site boundary condition – The sheep paddocks and airstrip are separately fenced with stock fencing. Access from Mcdonnell road is controlled through farm gates.
- Visible Signs of Contamination – No visible signs of contamination.
- Local Sensitive Environments – The nearest sensitive environment is the Arrow River approximately 800 m east of the site.

2.4 Site Condition and Surrounding Environment

The site is delineated into four areas of land use; steep grazed slopes, airstrip, sheep grazing and yards.

Along the south western edge of Lot 5 DP 26714 there are steep slopes rising over 15 m to the west. The slopes are sparsely vegetated with shrubs and grazed. In the centre east section there is a stand of mature pine trees.

A grass airstrip runs in a northwest orientation along the centre of the site (see Plate 1). At the north-western end there is a small aircraft hanger building and associated sheds (see Plate 2). The hanger and surrounding sheds were inspected. There was no chemical or fuel storage, no odours and no evidence of spills.

In the northwest and the centre north of the site cattle are grazed within paddocks fenced from the airstrip. A track runs along the northern end of the site, allowing access through gates (see Plate 3). In the north eastern corner of the site, there are yards beside Mcdonnell road (see Plate 3 and 4). The paddocks and yards were well maintained and there was no rubbish noted during the site visit.

The site and neighbouring properties are zoned rural general under the QLDC District Plan.

The Hills Golf Course boarders the site to the north and east. To the south of the site there is an access track and a rural residential property (see Figure 4).

The site is bordered to the east by Mcdonnell Road. Beyond Mcdonnell Road there is rural residential land and a south-easterly flowing ephemeral drainage line (see Figure 4). Between the property fence and Mcdonnell Road there is a powerline (see Plate 4 and 5).

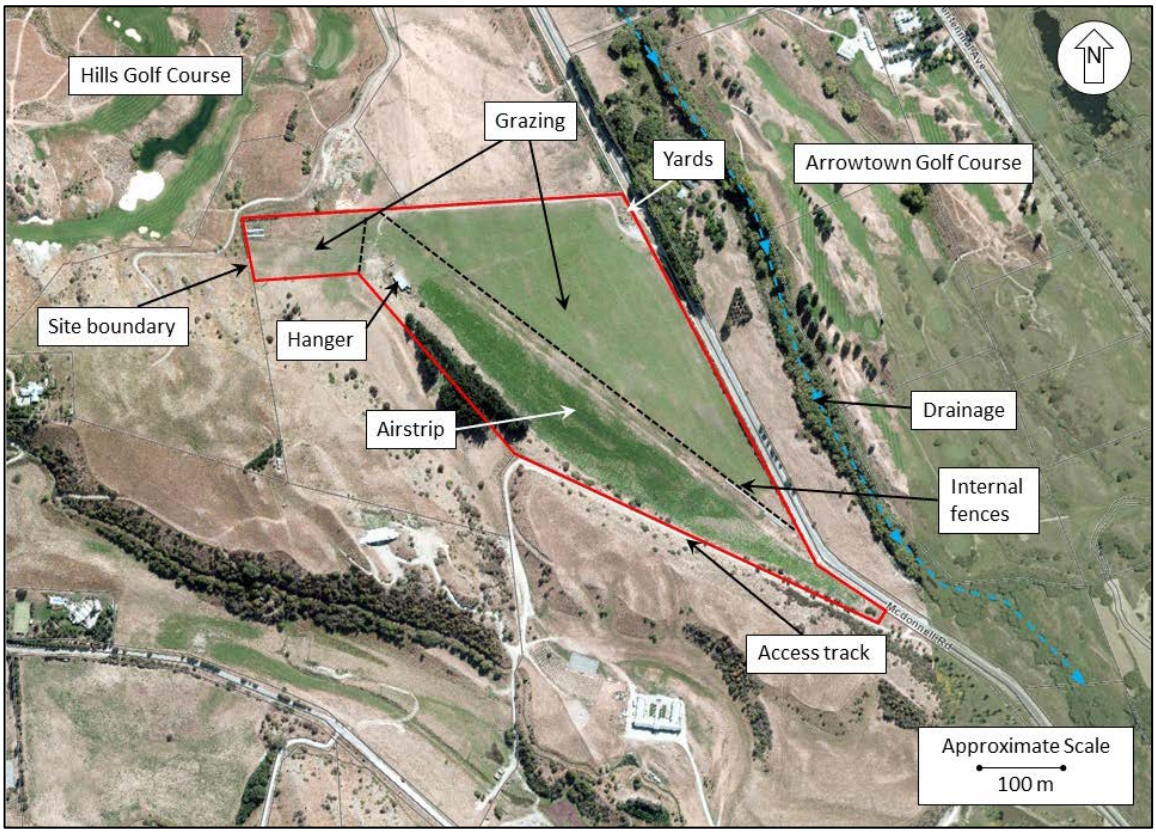

Figure 4: Site layout and surrounding land use

Plate 1: Looking west along airstrip. Hanger in background.

Plate 2: Behind hanger, looking north.

Plate 3: Northern track, pasture and stock yards.

Plate 4: Cattle yards and powerlines.

Plate 5: Southern access gate, Mcdonnell Road.

2.5 Geology

The site is located with the Rakia terrane aspiring lithologic association on a geology of pelitic schist, variably segregated, veined and foliated (Turnbull 2000).

According to the QLDC hazard maps there are no natural hazards present on the subject site, except for an area of liquefaction extending northwest from the north-western corner, defined as low risk, but requiring specific investigations for a definitive assessment of liquefaction (see Figure 5) (Queenstown Lakes District 2012 Liquefaction Hazard Assessment sited within QLDC webmaps, 2015).

The surface soils were described during the collection of soil samples as brown silt with organic matter. Soil descriptions are provided in Appendix C.

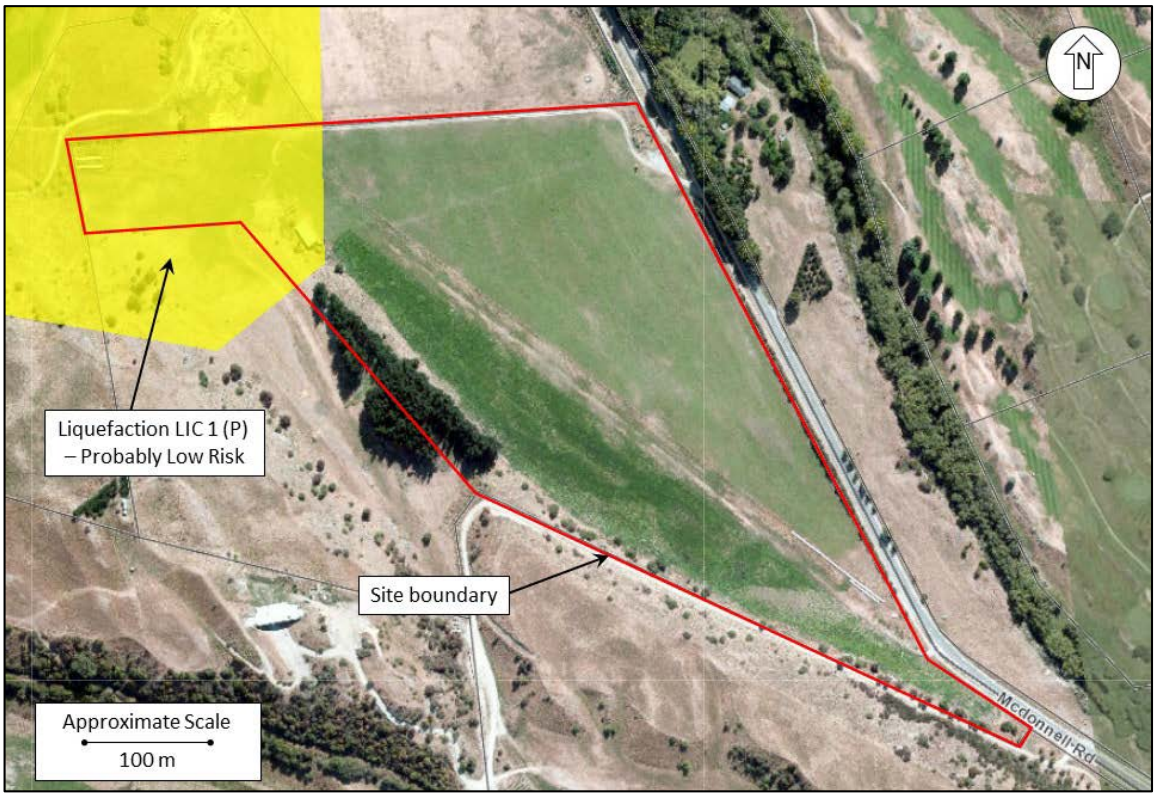

Figure 5: Hazard plan *(QLDC webmaps, 2015)*

2.6 Hydrology

The site is situated 2.12 km northeast of Lake Hayes and 800 m west of the Arrow River. There were no surface water features on site. Surface flow would drain with the slope of the land to the southeast and east. Approximately 140 m to the east of Mcdonnell road a narrow ephemeral tributary of the Arrow River flows southeast (see Figure 4).

The site investigation did not include a groundwater assessment. The site is located within the Wakatipu Basin aquifer system however it is not situated above any identified aquifers. The Mid Mill Creek Aquifer is situated east the subject site and north of Lake Hayes (ORC, 2014). The depth to groundwater on the site is unknown.

The location of groundwater bores within a 1 km radius of the site (held by the ORC) is provided in Appendix D. A total of 12 consented bores have been installed within 1 km of the site. The wells have been installed for a variety of purposes and are summarised as follows:

- 7 wells are used for domestic purposes;
- 3 wells are used for geological investigation (decommissioned); and
- 2 wells are for scheme use.

3.0 SAMPLING AND ANALYSIS PLAN

3.1 Data Quality Objectives

The data quality objectives (DQOs) of the DSI were to:

- Characterise the nature of contamination associated with the historical landuse of the site; and
- Determine the risk of any soil contamination encountered onsite to human health, based on the proposed rural residential landuse of the site.

3.2 Sampling and Analysis Plan

The sampling and analysis plan was designed to address the specific objectives, namely the characterisation of contaminants in soil associated with the broad-acre application of fertilisers and pesticides. Sampling locations are shown in Figure 4.

3.3 Sampling Rationale

The sampling rationale was designed to address possible broad acre applications to soil. Nine surface samples (0-0.1 m) were collected using an approximate grid of approximately 130 m. Sample locations are shown in Figure 6.

Surface sampling was considered appropriate for the assessment of pesticides for following reasons.

- Pesticides and heavy metals generally bind strongly to soils, generally remaining in the surface profile.
- People living on the site will predominantly be exposed to surface soils.

Four samples were selected and submitted to Hill laboratories for analysis of organochlorine pesticides (including 4,4-DDE, 2,4-DDT and Dieldrin). Eight submitted to Hill Laboratories to be prepared as a composite prior to analysis for heavy metals.

Figure 6: Sampling locations

3.4 Soil Sampling Methodology

Soil sampling was undertaken with the use of a spade. The following procedures were applied during the soil sampling process to gain representative samples:

- Field personnel wore a fresh pair of nitrile gloves between sampling events;
- Soil samples were transferred to 250 mL glass jars with Teflon lids as supplied by Hill Laboratories;
- All soil samples were unambiguously marked in a clear and durable manner to permit clear identification of all samples in the laboratory; and
- All samples were immediately placed in a cooled chilly bin to reduce the potential for volatilisation of should volatile contaminants be present.

3.5 Analytical Parameters

The laboratory analytical suite determined for the site investigation is in recognition of our understanding of the current and historical use of the subject site. DCG understands the site was historically farmed and used for loading planes with fertilisers for topdressing therefore the following contaminants were analysed for their presence on site:

- heavy metals; and
- organochlorine pesticides (including 4,4-DDE, 2,4-DDT and Dieldrin).

The laboratory methods utilised for the analysis are provided in the laboratory report (see Appendix E).

3.6 Soil Sample Field and Laboratory QA/QC

The field QA/QC procedures performed during the soil sampling are listed as follows:

- Use of standardised field sampling forms and methods;
- Samples were transferred under chain of custody procedures;
- All samples were labelled to show point of collection, project number, and date;
- Headspace in sample jars was avoided;
- The threads on the sampling jars were cleaned to avoid VOC loss; and
- All samples were stored in a cooled chilly bin containing ice while in the field.

All soil samples were kept refrigerated until couriered to Hill Laboratories. Hill Laboratories is IANZ accredited for the analysis of heavy metals and pesticides. Hill Laboratories conduct internal QA/QC in accordance with IANZ requirements.

3.7 Soil Guideline Values

Soil guideline values (SGVs) selected for application on this project are provided in Table 1. The guidelines were adopted with reference to the Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values (MfE, 2003b).

The heavy metal and organochlorine pesticide soil guideline values adopted for the site assessment were based on either the Soil Contaminant Standards (New Zealand 'Users' Guide: NES for Assessing & Managing Contaminants in Soil to Protect Human Health, 2012) or Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater (National Environment Protection (Assessment of Site Contamination) Measure 1999). Guidelines for rural residential

land use have been adopted for this site investigation based on proposed establishment of a residential buildings, a garden hub and an orchard. Where the National Environmental Protection Measures (1999) were adopted, the most conservative values were selected for the purposes of this assessment.

Table 1: Soil guidelines

Analyte	Guideline
Heavy Metals and Organochlorine Pesticides	1. Soil Contaminant Standards *in* New Zealand 'Users' Guide: NES for Assessing & Managing Contaminants in Soil to Protect Human Health 2012 (MfE, 2012). 2. Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater *in* National Environment Protection (Assessment of Site Contamination) Measure 2013 (NEPC, 2013).

3.8 Soil Analytical Result Review

Following the receipt of laboratory data, a detailed review of the data was performed to determine its accuracy and validity. All laboratory data was checked for analytical and typographical errors.

Once the data quality was established the soil data was checked against the Sampling Program DQOs.

One field duplicate soil sample was collected during the site investigation and analysed to review the reproducibility of the laboratory analysis. Acceptable percentage difference between duplication samples is discussed in section 4.

All organochlorine pesticide results were below the laboratory detection limit.

Results are presented in Appendix E.

4.0 INVESTIGATION RESULTS

The soil sample locations are provided in Figure 6 and summarised in Table 2 below.

Table 2: Soil sample summary

Sample Identification	Sample Depth (m)	Composite	Analysis
MR_01(0.1)	0.1	Individual	Heavy Metals
MR_02(0.1)	0.1	Composite 1	Heavy Metals
MR_03(0.1)	0.1		
MR_04(0.1)	0.1	Composite 2	Heavy Metals
MR_05(0.1)	0.1		
MR_06(0.1)	0.1	Composite 3	Heavy Metals
MR_07(0.1)	0.1		
MR_08(0.1)	0.1	Composite 4	Heavy Metals
MR_09(0.1)	0.1		
MR_01(0.1)	0.1	Organochlorine Pesticides (OCP)	
MR_04(0.1)	0.1		
MR_06(0.1)	0.1		
MR_08(0.1)	0.1		
DUPA	0.1	Heavy Metals	

4.1 Heavy Metals

The heavy metal results are presented in Table 3 and summarised as follows:

- All of the heavy metal results were below the adopted guideline values; and
- The concentrations of heavy metals detected are fairly consistent across all samples analysed and appear to represent background concentrations.

The consistency of the results confirms that the concentrations detected represent background concentrations. Given the consistency of the results the practice of adjusting the guideline value for composite samples is not required as it is highly unlikely that there is contaminant hotspots present on the site.

Table 3: Heavy metal results (mg/kg)

Sample Name	Composite	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
MR_02 (0.1), MR_03 (0.1)	Composite 1	10	0.13	10	9	17.4	9	43
MR_04 (0.1), MR_05 (0.1)	Composite 2	9	<0.10	10	8	15.1	8	40
MR_06 (0.1), MR_07 (0.1)	Composite 3	8	<0.10	12	10	10.8	6	30
MR _08 (0.1), MR_09 (0.1)	Composite 4	11	0.12	10	9	17.7	8	39
MR_01 (0.1)	Individual .	9	0.16	24	13	12.9	16	48
Guideline		17[1]	0.8[1]	>10,000[1]	>10,000[1]	160[1]	400[2]	7400[2]

< denotes concentration below laboratory detection limits
[1] Appendix B Soil Contaminant Standards in New Zealand 'Users' Guide: NES for Assessing & Managing Contaminants in Soil to Protect Human Health 2012 (MfE, 2012).
[2] Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater in National Environment Protection (Assessment of Site Contamination) Measure 2013 Volume 2 (NEPC, 2013).

4.2 Organochlorine Pesticides

All pesticide concentrations were reported below laboratory detection limits. The organochlorine pesticide results are presented in Appendix E.

4.3 Laboratory Procedures

Methods used by Hills Laboratories for laboratory analysis are summarised in the analysis report provided included in Appendix E. Hill Laboratories did not complete specific in-house QA/QC analysis

4.4 Field duplicates

One field duplicate soil sample was collected during the site investigation and analysed to review the reproducibility of the laboratory analysis. The duplicate and the corresponding sample results are presented in Table 4 below.

Table 4: Percentage differences of duplicates

	MR01_0.1 (0.1)	DupA	% Difference
Arsenic	9	9	0
Cadmium	0.16	0.18	11.8
Chromium	24	25	4.1
Copper	13	13	0
Lead	12.9	12.8	0.8
Nickel	16	16	0
Zinc	48	51	6.1

An acceptable percentage difference between duplication samples is less than 30 to 50 % (MfE, 2011). The highest relative percentage difference was 11.8 % (for cadmium), which is considered acceptable for soil analysis. The QA/QC analysis indicates the sampling and analysis undertaken was reproducible.

5.0 CONCEPTUAL SITE MODEL

5.1 Sources of Potential Contamination

Based on our review of the current and historical activities that have occurred within the site the potential hazardous substances that may be present include a range of heavy metals and pesticides associated with;

- broad acre application of persistent pesticides and fertilisers; and the
- handling and storage of fertilisers in and around the hanger area of the airstrip..

5.2 Risks to Human Health

The risk to human health from exposure to contaminants depends on the contaminant toxicity, concentration and the length of time and type of the exposure. To account for the range of exposure scenarios, the NES soil contaminant standards have been derived for five standard landuse scenarios. Based on the proposal, DCG understands the proposed landuse of the site will be consistent with a rural/lifestyle landuse scenario.

5.2.1 Broad acre application of fertiliser and pesticides

Due to the low intensity of historical farming on the site and absence of persistent pesticides found in soil analysis, DCG considers it is unlikely that concentrations of contaminants within the soil would be present at concentrations that will exceed the contaminant standards for a rural residential land use scenario within areas that have been used for farming.

5.2.2 Storage and handling of fertiliser associated with the Airfield and hanger

DCG recommend further soil investigation in and around the hanger and associated area of the airstrip to assess possible soil contamination from heavy metals and pesticides that may have resulted from handling of fertilisers.

5.3 Other NES Matters

At this stage in the project it is unclear what degree of earthworks will be involved in the development of the Arrowtown Lifestyle Retirement Village, however if offsite disposal of soil is required some analysis of soil contaminant concentrations should be undertaken to determine the appropriate disposal options.

6.0 CONCLUSIONS

Based on the findings of the PSI, the following conclusions are made:

- Historically the property has been used for used for loading planes with fertilisers for topdressing within the airstrip area and, in the remaining areas for agricultural purposes and may have received persistent pesticide and fertilizer applications;
- Current activities that occur on the site includes cattle grazing and an airstrip. The owner has confirmed that fuel containers and bulk fertilizers were not stored on site;
- Agricultural infrastructure on site is limited to cattle yards in the north eastern corner beside Mcdonnell Road. The airstrip has a hanger and associated storage sheds;
- The site is subject to the provisions of the NES due to the history of agricultural activities that are associated with the handling and application of agrichemicals included on the Hazardous Activities and Industries List (HAIL);
- Based on the Contaminated Land Management Guidelines Schedule B and our review of the activities that have occurred at site, the potential hazardous substances that may be present include a range of heavy metals and pesticides associated with;
    - broad acre application of persistent pesticides and fertilisers; and the
    - handling and storage of fertilisers in and around the hanger area of the airstrip.
- The site and neighbouring properties are zoned rural general. Surrounding land use include golf courses and rural residential property;
- Searches of the Otago Regional Council's "Database of Selected Landuses" did not find any records of contaminated sites on the study site;
- No organochlorine pesticides were detected in analysis of soils taken from the site;
- Heavy metal concentrations detected were all below the adopted guideline values and appear to largely represent background concentrations;
- DCG considers it is highly unlikely that concentrations of contaminants within the soil associated with broadacre application of fertilisers and pesticides would be present at concentrations that will exceed contaminant standards for a rural residential land use scenario;
- DCG recommend further soil investigation in and around the hanger and associated area of the airstrip to assess possible soil contamination from heavy metals and pesticides that may have resulted from handling of fertilisers.

In summary, the PSI has identified historical land use activities that may have impacted the soil quality of the site. Based on the results of this Preliminary Site Investigation, DCG concludes it is highly unlikely that there is a risk to human health from the establishment of a residential development and the site is fit for activities consistent with the rural residential landuse scenario set out in the NES.

7.0 REFERENCES

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Appendices

Appendix A

Davis Consulting Group Contaminated Land Experience

Appendix A

Glenn Davis is the director of Davis Consulting Group and has over 15 years post graduate experience working as an Environmental Scientist. Glenn has accumulated a significant volume of work experience in the Contaminated Land field undertaking preliminary site investigations (PSIs), detailed site investigations (DSIs) and remediation projects in New Zealand, Australia, Asia, the United Kingdom and Ireland. The following provides a summary of Glenn Davis's experience.

Davis Consulting Group (2007 – present): Principal Environmental Scientist – completed multiple preliminary and detailed site investigations in Otago and Southland predominantly for the land development industry. DCG also provides contaminated land advice to district and regional councils.

RPS Australia (2003 – 2006): Supervising Environmental Scientist managing multiple detailed site investigations in the land development industrial and operated as an environmental specialist for Chevron on Barrow Island monitoring and managing a number of large contaminated groundwater plumes.

URS Ireland (2001 – 2003): - Senior Environmental Scientist undertaking multiple PSIs and DSIs on services stations and train station throughout Ireland. Glenn was also involved in the design and operation of a number of large scale remediation projects, predominantly associated with the removal of hydrocarbon contaminated soil and recovery or hydrocarbons impacting groundwater.

ERM Australia (1998 – 2000) – Working as a project level environmental scientist Glenn completed in excess of 30 detailed site investigations and remedial projects on service stations, concrete batching plants, and transport depots.

Appendix B

Historical Certificates of Title

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Historical Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **OT18D/341**
Land Registration District **Otago**
Date Issued 31 August 1998

Prior References
OT17D/1101

Estate	Fee Simple
Area	20.0400 hectares more or less
Legal Description	Lot 5 Deposited Plan 26714

Original Proprietors
Roger Francis Monk

Interests

SUBJECT TO SECTION 243 (C) RESOURCE MANAGEMENT ACT 1991 (SEE DP 26714)

746961.17 Transfer creating the following easements - 1.2.1990 at 9.51 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Right of way	Section 102 Block VII Shotover Survey District - CT OT18B/1030	B SO 23066	Lot 5 Deposited Plan 26714 - herein	
Right of way	Section 1 Survey Office Plan 23066 - CT OT13A/734	A SO 23066	Lot 5 Deposited Plan 26714 - herein	

904455.7 Easement Certificate specifying the following easements - 27.3.1996 at 9.05 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 1 Deposited Plan 25341 - CT OT17B/806	n-o DP 25341	Lot 5 Deposited Plan 26714 - herein	Section 243 (a) Resource Management Act 1991

915673 Transfer creating the following easements - 6.9.1996 at 2.49 pm

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 5 Deposited Plan 26714 - herein	f-g DP 25341	Lot 4 Deposited Plan 25341 - CT OT17B/809	Resource Management Act 1991 Section 243 (a)
Convey water	Lot 5 Deposited Plan 26714 - herein	g-h DP 25341	Lot 4 Deposited Plan 25341 - CT OT17B/809	Resource Management Act 1991 Section 243 (a)

953679.8 Easement Certificate specifying the following easements - 31.8.1998 at 10.56 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 1 Deposited Plan 25341 - CT OT17B/806	m-n DP 26714	Lot 5 Deposited Plan 26714 - herein	Section 243 (a) Resource Management Act 1991
Convey water	Lot 5 Deposited Plan 26714 - herein	n-o-p DP 26714	Lot 2 Deposited Plan 26714 - CT OT18D/338	Section 243 (a) Resource Management Act 1991
Convey water	Lot 5 Deposited Plan 26714 - herein	n-o-r DP 26714	Lot 1 Deposited Plan 26714 - CT OT18D/337	Section 243 (a) Resource Management Act 1991

Identifier **OT18D/341**

964443.1 Transfer creating the following easements - 23.3.1999 at 12.55 pm

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 5 Deposited Plan 26714 - herein	f-g DP 25341	Lot 2 Deposited Plan 26714 - CT OT18D/338	Resource Management Act 1991 Section 243 (a)

Land Covenant in Deed 964442.3 - 23.3.1999 at 12.55 pm

5173174.1 Mortgage to The National Bank of New Zealand Limited - 15.3.2002 at 9:40 am

6047016.1 Discharge of Mortgage 5173174.1 - 18.6.2004 at 9:00 am

Appurtenant hereto is a right to take and convey water and a right to convey electricity created by Easement Instrument 6047016.2 - 18.6.2004 at 9:00 am

The easements created by Easement Instrument 6047016.2 are subject to Section 243 (a) Resource Management Act 1991

6047016.3 Transfer to Roger Francis Monk and Cook Adam Trustees Limited - 18.6.2004 at 9:00 am

6047016.4 Mortgage to The National Bank of New Zealand Limited - 18.6.2004 at 9:00 am

8667479.1 CAVEAT BY AURORA ENERGY LIMITED - 21.12.2010 at 11:28 am

8736314.1 Withdrawal of Caveat 8667479.1 - 24.5.2011 at 2:46 pm

8736314.2 Surrender of the right to convey water over part marked n-o-r on DP 26714 specified in Easement Certificate 953679.8 - 24.5.2011 at 2:46 pm

Subject to a right to convey water over parts marked E, B & D on DP 438524 created by Easement Instrument 8736314.3 - 24.5.2011 at 2:46 pm

Subject to a right (in gross) to convey electricity over parts marked A, B & D and right to transform electricity over part marked B all on DP 438524 in favour of Aurora Energy Limited created by Easement Instrument 8736314.4 - 24.5.2011 at 2:46 pm

Subject to a right (in gross) to convey telecommunications and computer media over parts marked A, C & D on DP 438524 in favour of Telecom New Zealand Limited created by Easement Instrument 8736314.5 - 24.5.2011 at 2:46 pm

Identifier **OT18D/341**

LT69

Reference
Prior CT 17D/1101
Document No. 953679.9

REGISTER

18D/341

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT 1952

This Certificate dated the 31st day of August One Thousand Nine Hundred and Ninety Eight under the seal of the District Land Registrar of the Land Registration District of OTAGO

WITNESSETH that **ROGER FRANCIS MONK**

is seised of an estate in **fee simple** (subject to such reservations, restrictions, encumbrances and interests as are notified by memorial endorsed hereon) in the land hereinafter described, delineated on the plan hereon, be the several admeasurements a little more or less, that is to say All that parcel of land containing 20 0400 hectares, more or less being **LOT 5 DEPOSITED PLAN 26714**

OTAGO DISTRICT LAND REGISTRAR NEW ZEALAND
for District Land Registrar

SUBJECT TO SECTION 243(C) RESOURCE MANAGEMENT ACT 1991 (DP 26714) - all 31 8 1998 at 10.56

For DLR

Appurtenant hereto is a right of way over part Section 102 Block VII Shotover SD CT 18B/1030 marked B on SO Plan 23066 and over Section 1 SO Plan 23066 CT 13A/734 marked A on SO Plan 23066 created by Transfer 746961 17 - 1 2 1990 at 9 5[illegible]

DISCHARGED

832247 3 Mortgage to Westpac Banking Corporation - 18 6 1993 at 10 1[illegible]

Appurtenant hereto is a right to convey water over part Lot 1 marked n-o DP 25341 CT 17B/806 specified in Easement Certificate 904455 7 - 27 3 1996 at 9 05

The above easement is subject to Section 243(a) Resource Management Act 1991

Subject to rights to convey water over part herein marked f-g and g-h DP 25341 appurtenant to Lot 4 DP 25341 CT 17B/809 created by Transfer 915673 - 6 9 1996 at 2 49

The above easements are subject to Section 243(a) Resource Management Act 1991

953679 8 Easement certificate affecting Lots on DP 26714

NATURE	SERVIENT LAND	DOMINANT LAND
Rights to convey water	Lot 1 DP 25341 CT 17B/806 m-n	5
	5 n-o-p	2 CT 18D/338
	5 n-o-r	1 CT 18D/337

The above easements will be subject to Section 243(a) Resource Management Act 1991 when created

18D/341

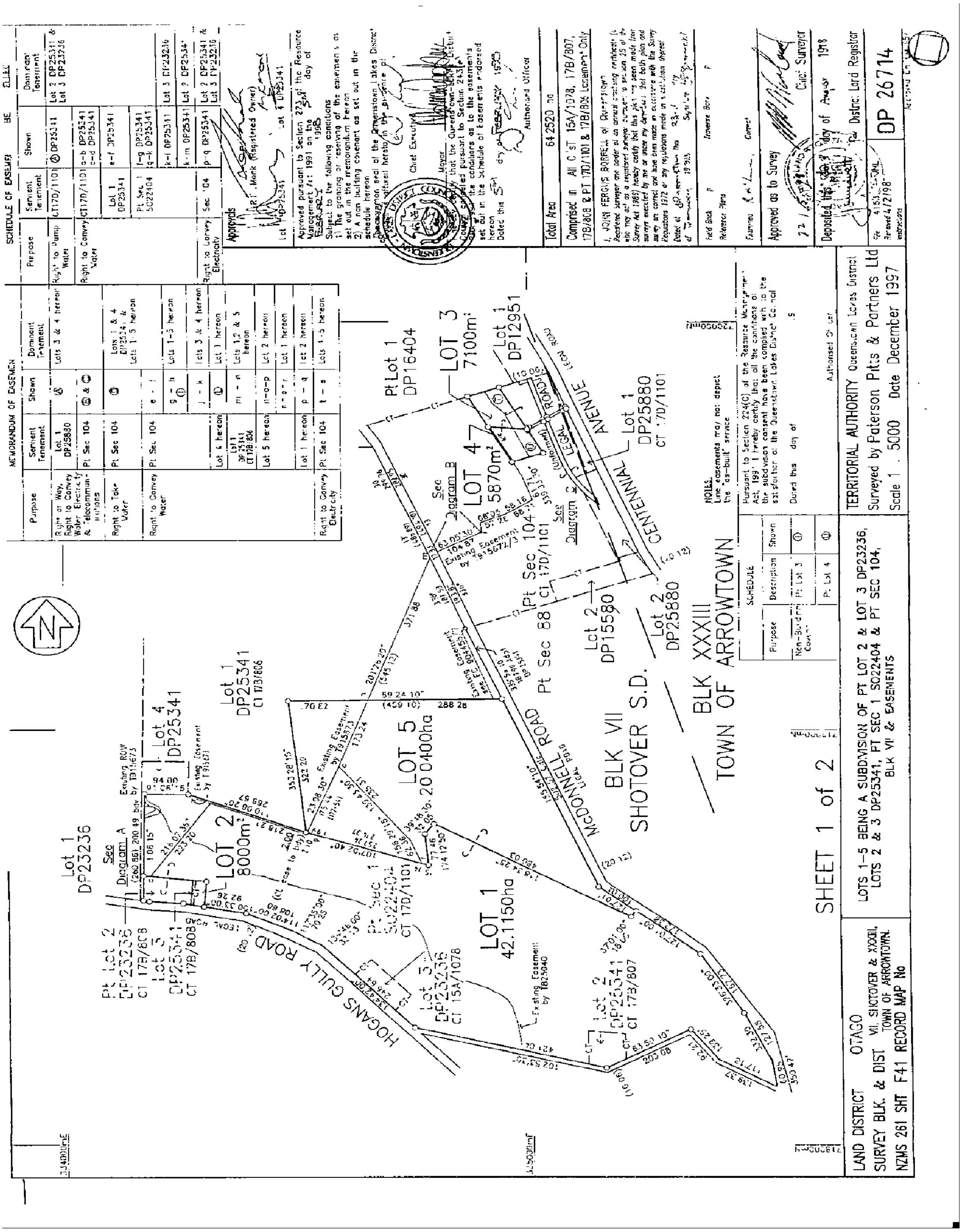
Land Covenant contained in Deed 964442.3

Subject to a right to convey water over part herein marked f-g on DP 25341 appurtenant to Lot 2 DP 26714 CT 18D/338 created by Transfer 964443.1

The above easements are subject to Section 243(a) Resource Management Act 1991

All 23.3.1999 at 12.55

for RGL



LOT 1
42.1150ha
LOT 2
8000m²
LOT 3
7100m²
LOT 4
5870m²
LOT 5
20.0400ha
HOGANS GULLY ROAD
McDONNELL ROAD
CENTENNIAL AVENUE
BLK VII
SHOTOVER S.D.
BLK XXXIII
TOWN OF ARROWTOWN
SHEET 1 of 2
LOTS 1-5 BEING A SUBDIVISION OF PT LOT 2 & LOT 3 DP23236, LOTS 2 & 3 DP25341, PT SEC 1 SO22404 & PT SEC 104, BLK VII & EASEMENTS
TERRITORIAL AUTHORITY Queenstown Lakes District
Surveyed by Paterson Pitts & Partners Ltd
Scale 1 : 5000 Date December 1997
LAND DISTRICT OTAGO
DP 26714

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **OT18D/341**
Land Registration District **Otago**
Date Issued 31 August 1998

Prior References
OT17D/1101

Estate	Fee Simple
Area	20.0400 hectares more or less
Legal Description	Lot 5 Deposited Plan 26714

Proprietors
Roger Francis Monk and Cook Adam Trustees Limited

Interests

746961.17 Transfer creating the following easements - 1.2.1990 at 9.51 am

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Right of way	Section 102 Block VII Shotover Survey District - CT OT18B/1030	B SO 23066	Lot 5 Deposited Plan 26714 - herein	
Right of way	Section 1 Survey Office Plan 23066 - CT OT13A/734	A SO 23066	Lot 5 Deposited Plan 26714 - herein	

904455.7 Easement Certificate specifying the following easements - 27.3.1996 at 9.05 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 1 Deposited Plan 25341 - CT OT17B/806	n-o DP 25341	Lot 5 Deposited Plan 26714 - herein	Section 243 (a) Resource Management Act 1991

915673 Transfer creating the following easements - 6.9.1996 at 2.49 pm

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 5 Deposited Plan 26714 - herein	f-g DP 25341	Lot 4 Deposited Plan 25341 - CT OT17B/809	Resource Management Act 1991 Section 243 (a)
Convey water	Lot 5 Deposited Plan 26714 - herein	g-h DP 25341	Lot 4 Deposited Plan 25341 - CT OT17B/809	Resource Management Act 1991 Section 243 (a)

953679.8 Easement Certificate specifying the following easements - 31.8.1998 at 10.56 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Convey water	Lot 1 Deposited Plan 25341 - CT OT17B/806	m-n DP 26714	Lot 5 Deposited Plan 26714 - herein	Section 243 (a) Resource Management Act 1991
Convey water	Lot 5 Deposited Plan 26714 - herein	n-o-p DP 26714	Lot 2 Deposited Plan 26714 - CT OT18D/338	Section 243 (a) Resource Management Act 1991

964443.1 Transfer creating the following easements - 23.3.1999 at 12.55 pm

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction

Identifier **OT18D/341**

Convey water	Lot 5 Deposited Plan 26714 - herein	f-g DP 25341	Lot 2 Deposited Plan 26714 - CT OT18D/338	Resource Management Act 1991 Section 243 (a)

Land Covenant in Deed 964442.3 - 23.3.1999 at 12.55 pm

Appurtenant hereto is a right to take and convey water and a right to convey electricity created by Easement Instrument 6047016.2 - 18.6.2004 at 9:00 am

The easements created by Easement Instrument 6047016.2 are subject to Section 243 (a) Resource Management Act 1991

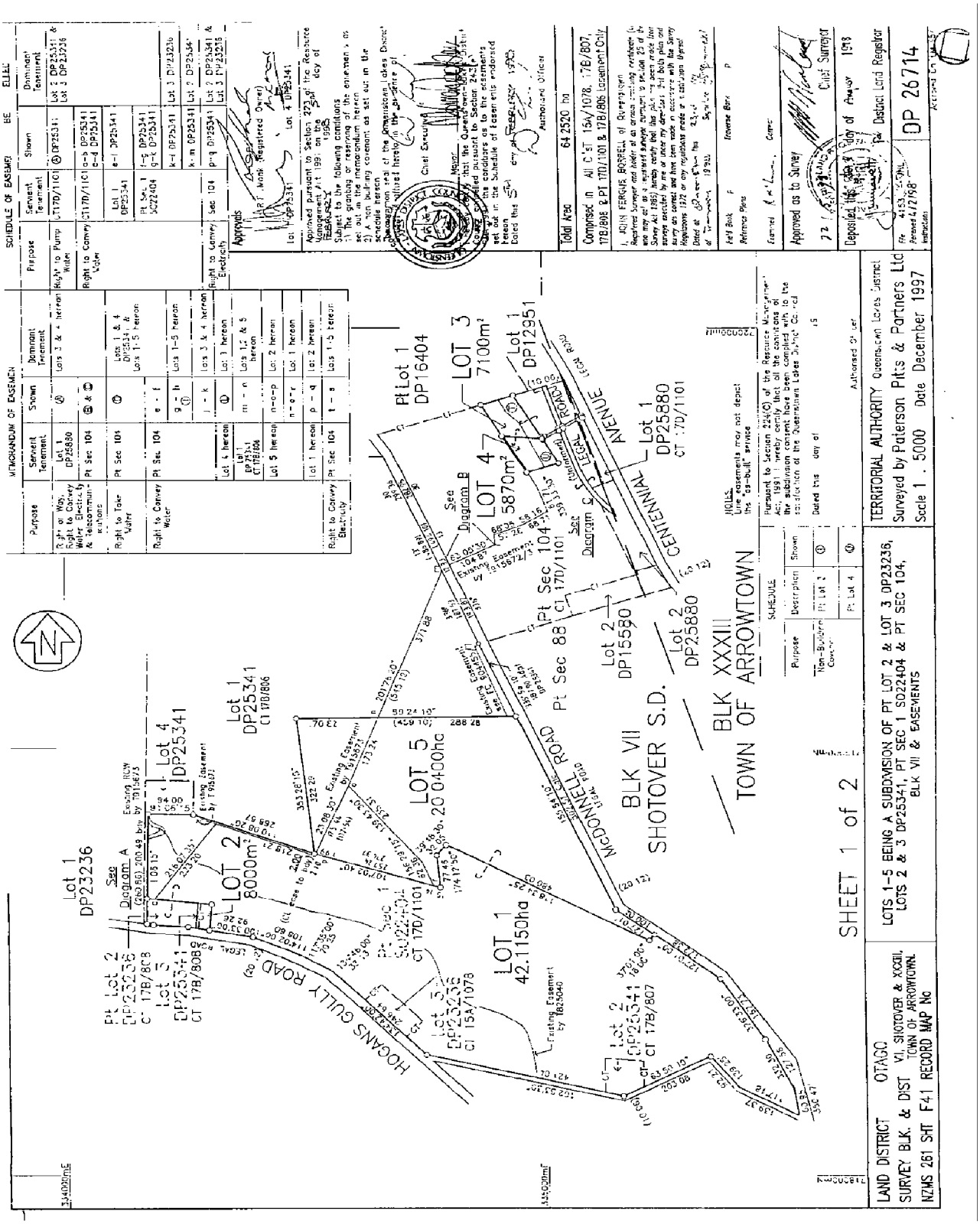
6047016.4 Mortgage to The National Bank of New Zealand Limited - 18.6.2004 at 9:00 am

Subject to a right to convey water over parts marked E, B & D on DP 438524 created by Easement Instrument 8736314.3 - 24.5.2011 at 2:46 pm

Subject to a right (in gross) to convey electricity over parts marked A, B & D and right to transform electricity over part marked B all on DP 438524 in favour of Aurora Energy Limited created by Easement Instrument 8736314.4 - 24.5.2011 at 2:46 pm

Subject to a right (in gross) to convey telecommunications and computer media over parts marked A, C & D on DP 438524 in favour of Telecom New Zealand Limited created by Easement Instrument 8736314.5 - 24.5.2011 at 2:46 pm

Identifier **OT18D/341**



Appendix C

Soil Profile Log

SOIL PROFILE LOG

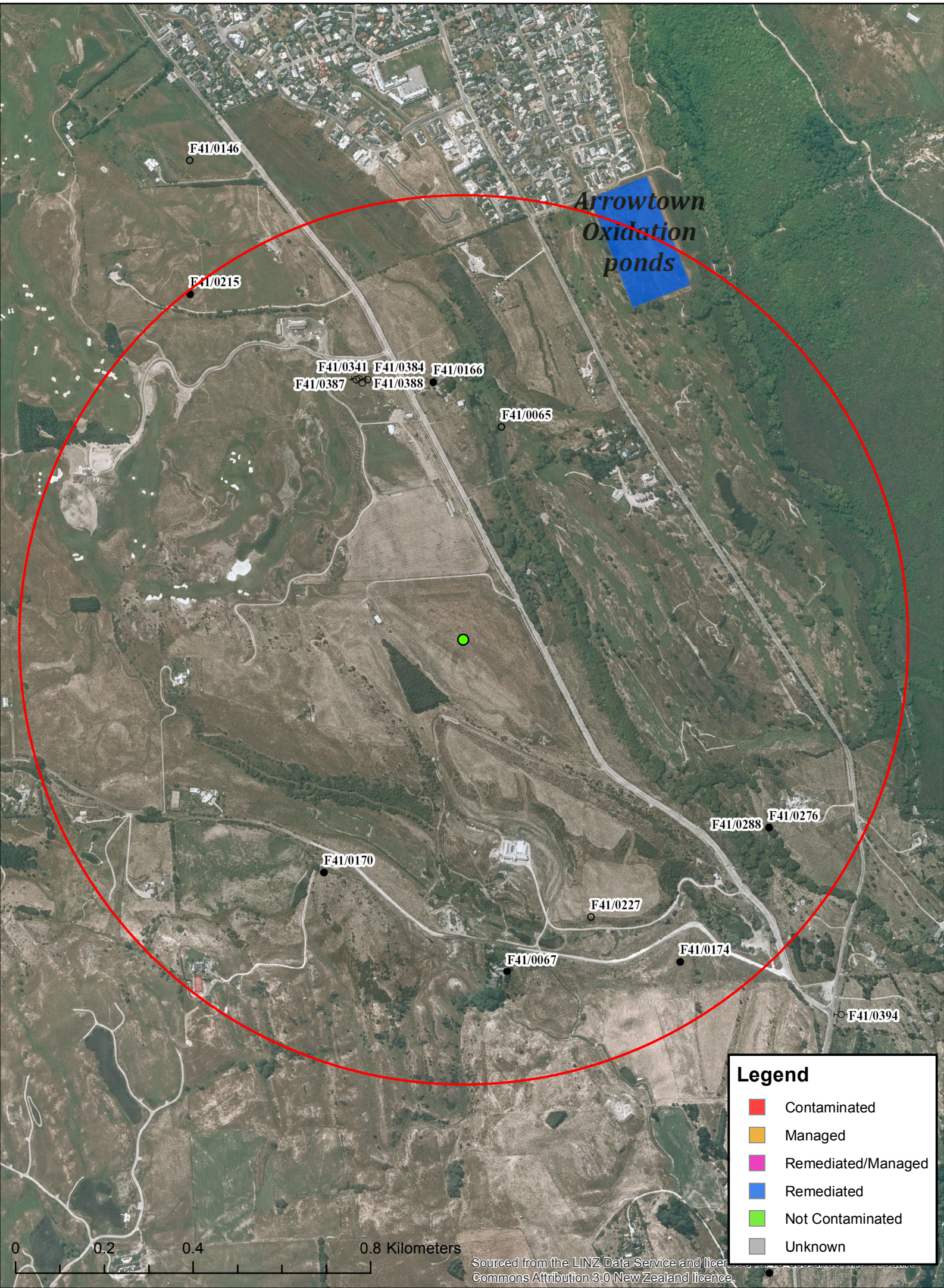
PROJECT NUMBER: 15066 | FIELD STAFF: Carrie Pritchard | DATE: 20/10/2015
SITE NAME: Arrowtown Retirement Village | METHOD: Spade | WEATHER: Fine

Sample Location	Coordinates		Sample Depth	Sample Time	Sample ID	Soil Profile Log
1	1272206	5012782	0-0.1	920	MR01_0.1	Brown SILT with 10% grey slate cobble (2cm). Grass root OM. Damp
2	1272206	5012782	0-0.1	1800	DUPA	Brown SILT with 10 % grey slate cobble (2cm). Grass root OM. Damp
3	1272144	5012903	0-0.1	947	MR02_0.1	Brown SILT with 10 % grey small gravel (1cm). Grass root OM. Damp
4	1272078	5012997	0-0.1	957	MR03_0.1	Brown SILT with sand. Grass root OM. Moist
5	1272000	5013101	0-0.1	1007	MR04_0.1	Brown SILT. Grass root OM. Moist
6	1271856	5013157	0-0.1	1021	MR05_0.1	Brown SILT. Grass root OM. Moist
7	1272013	5013186	0-0.1	1025	MR06_0.1	Brown SILT with 50 % gravel and cobble. Very compact. Some grass root OM. Moist. Within cattle yard.
8	1272010	5013205	0-0.1	1037	MR07_0.1	Brown SILT with 50 % gravel and cobble. Very compact. Some grass root OM. Moist. Within cattle yard.
9	1271791	5013092	0-0.1	1107	MR08_0.1	Brown SILT. Grass root OM. Damp.
10	1271937	5012977	0-0.1	1119	MR09_0.1	Brown SILT. Grass root OM. Damp.

Appendix D

Bore Search Information

Land-use and Site Contamination Request - McDonnell Road



Appendix E

Laboratory analytical certificate and results

Hill Laboratories
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited
1 Clyde Street
Private Bag 3205
Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

ANALYSIS REPORT

Client:	Davis Consulting Group Limited	**Lab No:**	1491239 SPv1
Contact:	C Pritchard	**Date Registered:**	21-Oct-2015
	C/- Davis Consulting Group Limited	**Date Reported:**	27-Oct-2015
	PO Box 2450	**Quote No:**	
	Wakatipu	**Order No:**	
	QUEENSTOWN 9349	**Client Reference:**	
		Submitted By:	C Pritchard

Sample Type: Soil

Sample Name:		MR01_0.1 20-Oct-2015 9:20 am	MR04_0.1 20-Oct-2015 10:07 am	MR06_0.1 20-Oct-2015 10:25 am	MR08_0.1 20-Oct-2015 11:07 am	DUPA 20-Oct-2015 6:00 pm
Lab Number:		1491239.1	1491239.4	1491239.6	1491239.8	1491239.10
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	9	-	-	-	9
Total Recoverable Cadmium	mg/kg dry wt	0.16	-	-	-	0.18
Total Recoverable Chromium	mg/kg dry wt	24	-	-	-	25
Total Recoverable Copper	mg/kg dry wt	13	-	-	-	13
Total Recoverable Lead	mg/kg dry wt	12.9	-	-	-	12.8
Total Recoverable Nickel	mg/kg dry wt	16	-	-	-	16
Total Recoverable Zinc	mg/kg dry wt	48	-	-	-	51
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
alpha-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
beta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
delta-BHC	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
cis-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
trans-Chlordane	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	-
2,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
4,4'-DDD	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
2,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
4,4'-DDE	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
2,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
4,4'-DDT	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Total DDT Isomers	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06	-
Dieldrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Endosulfan I	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Endosulfan II	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Endosulfan sulphate	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Endrin	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Endrin aldehyde	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Endrin ketone	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Heptachlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Heptachlor epoxide	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Hexachlorobenzene	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-
Methoxychlor	mg/kg dry wt	< 0.010	< 0.010	< 0.010	< 0.010	-

Sample Type: Soil						
Sample Name:		Composite of MR02_0.1 + MR03_0.1	Composite of MR04_0.1 + MR05_0.1	Composite of MR06_0.1 + MR07_0.1	Composite of MR08_0.1 + MR09_0.1	
Lab Number:		1491239.11	1491239.12	1491239.13	1491239.14	
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	10	9	8	11	-
Total Recoverable Cadmium	mg/kg dry wt	0.13	< 0.10	< 0.10	0.12	-
Total Recoverable Chromium	mg/kg dry wt	10	10	12	10	-
Total Recoverable Copper	mg/kg dry wt	9	8	10	9	-
Total Recoverable Lead	mg/kg dry wt	17.4	15.1	10.8	17.7	-
Total Recoverable Nickel	mg/kg dry wt	9	8	6	8	-
Total Recoverable Zinc	mg/kg dry wt	43	40	30	39	-

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1, 10-14
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	1, 10-14
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082).. Tested on dried sample	0.010 - 0.06 mg/kg dry wt	1, 4, 6, 8
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	1, 10-14
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	2-9

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Ara Heron BSc (Tech)
Client Services Manager - Environmental Division

Davis Consulting Group Limited
Arrow Lane
Arrowtown
Phone: 03 409 8664
email: glenn.davis@davisconsultinggroup.co.nz

DAVIS consulting group

Sheet 1 of 1

Chain of Custody

Laboratory use

Date Collected: 20th OCTOBER 2015

Sampling Conditions *(brief description of weather conditions/flow rates etc)*: FINE SUNNY

Your Address: Davis Consulting Group Ltd.
Arrow Lane
Arrowtown 9302

Samples Filtered and/or Preserved?

Priority: HIGH urgent. MC

CoC to be emailed back: Yes.

Phone Number: 03 409 8664

Email Address: carrie @davisconsultinggroup.co.nz

Project No/Property Name:

Who Sampled: CARRIE PRITCHARD.

Samples Released By (Signature):
Date and Time Released:

Samples Received By (Signature):
Date and Time Received:

Sample ID	Date	Time	Matrix	Analytes 1						
MR01_0.1	20/10	0920	Soil	OCP	Metals					
MR02_0.1	"	0947	Soil	] COMPOSITE FOR METALS ANALYSIS						
MR03_0.1	"	0958	Soil							
MR04_0.1	"	1007	Soil	OCP	] COMPOSITE FOR METALS ANALYSIS.					
MR05_0.1	"	1021	Soil							
MR06_0.1	"	1025	Soil	OCP	] COMPOSITE FOR METALS ANALYSIS.					
MR07_0.1	"	1037	Soil							
MR08_0.1	"	1107	Soil	OCP	] COMPOSITE FOR METALS ANALYSIS.					
MR09_0.1	"	1119	Soil							
DUP A	"	1800.	Soil	OCP	Metals.					
			Soil							
			Soil							

Note:

Temperature On Arrival

6.2 °C

Temperature was measured on arbitrarily chosen samples in this batch. The Microbiology sample temperature will be recorded at Melville Lab before testing.

3114912399

Job No: 149 1239

Date Recv: 21-Oct-15 06:51

Received by: Jennifer Singlewood