PRELIMINARY SITE INVESTIGATION

Milldale Infrastructure Project
Argent Lane Extension

Prepared for:

Auckland Transport

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BASIS OF REPORT

This report has been prepared by SLR Consulting NZ Limited (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Auckland Transport (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
710.10664-R01-v4.0	1 October 2020	Mo Daud, CEnvP	Hugh Selby, CEnvP	Ruairi Hanly, CEnvP
710.10664-R01-v4.0	20 December 2019	Mo Daud, CEnvP	Hugh Selby, CEnvP	Mo Daud, CEnvP
710.10664-ROB-v3.0	20 December 2019	Mo Daud, CEnvP	Hugh Selby, CEnvP	Mo Daud, CEnvP

EXECUTIVE SUMMARY

Auckland Transport (AT) commissioned SLR Consulting New Zealand Pty Ltd (SLR) to prepare a Preliminary Site Investigation (PSI) for the Milldale Infrastructure – Argent Lane Extension Project (the "project").

Relevant details regarding the project, which forms part of the draft Silverdale West / Dairy Flat Structure Plan, are as follows:

- Construction of a connecting road between Old Pine Valley Road and the existing Pine Valley Road with pedestrian footpaths and cycleways.
- It is proposed to commence within the next two years with the construction of two-lanes then widening to four-lanes at a later date.
- Dairy Flat Highway is proposed to be widened to four lanes with an upgrade to the Dairy Flat Highway and Pine Valley Road intersection (signalised) in the interim (within two years). The long-term plan is to future proof Dairy Flat Highway for cycling and pedestrian lanes to approximately 35.3m width (excluding batters).
- The Dairy Flat Highway/Pine Valley Road ultimate intersection arrangement is still to be confirmed but would be 4 to 6 lanes (total) which tapers back to 2 to 4 lanes.

The purpose of the PSI is to support the notice of requirement and regional resource consents on behalf of AT. The objective of the PSI is to provide input relating to potential ground contamination for the project.

The PSI has been undertaken with reference to the requirements of:

- Ministry of Environment (MfE) Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand (updated 2011) (MfE, 2011);
- Resource Management (National Environmental Standard for Assessing and Managing Contamination in Soil to Protect Human Health) Regulations 2011 (NES Soil); and
- Auckland Unitary Plan Operative in Part (AUP-OP).

Based on the proposed road corridors provided to SLR (Draft Copy, July 2019), the PSI has not identified any Hazardous Activities and Industries Lists (HAIL) sites or activities within the Project area. It is therefore concluded that the NES Soil is not applicable to the project. Based on these findings, SLR considers the contaminated land rules under Section E30 of the AUP-OP do not apply to the project.

It is noted however that the NES Soil may apply to properties adjacent to project area, such as the property located at 1732 Dairy Flat Highway due to the presence of stockpiled soil and fill material from unknown sources.

Based on the PSI findings, SLR recommends that:

- The proposed resource consent conditions for the project include a note detailing accidental discovery protocols of the AUP-OP.
- Prior to the project construction, prepare a Construction Environmental Management Plan (CEMP) to address any potential human health (e.g. soil, groundwater, dust and soil vapour risk) and/or environmental risks associated with the project.

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- Undertake an assessment of contamination status of the large stockpile identified within the property located at 1732 Dairy Flat Highway, Dairy Flat, should the final design involve soil disturbances that extends into this property.

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1 Introduction

1.1 Background

Auckland Transport (AT) commissioned SLR Consulting New Zealand Pty Ltd (SLR) to prepare a Preliminary Site Investigation (PSI) for the Milldale Infrastructure – Argent Lane Extension Project (the "project").

The project is part of the draft Silverdale West / Dairy Flat Structure Plan, which is situated directly south-west and north-west of the Silverdale SH1 Interchange. Dairy Flat Highway forms most of the western boundary. The structure plan covers around 600 hectares of predominately greenfield land. The area is currently zoned as Future Urban in the Auckland Unitary Plan Operative in Part (AUP-OP). Auckland Council proposes to rezone the area for Light Industrial use.

Copies of relevant draft plans showing the proposed road corridors (dated 26 July 2019) provided to SLR are included in **Appendix A**.

1.1.1 Project description

The project involves construction of a connecting road between Old Pine Valley Road and the existing Pine Valley Road with pedestrian footpaths and cycleways. The project is proposed to commence within the next two years with the construction of two lanes then widening to four lanes later (around 2036).

Dairy Flat Highway is proposed to be widened to four lanes and an upgrade to the Dairy Flat Highway and Pine Valley Road intersection (signalised) in the interim (within two years). The long-term plan is to future proof Dairy Flat Highway for cycling and pedestrian lanes (around 2036) to approximately 35.3m width (excluding batters). The Dairy Flat Highway / Pine Valley Road ultimate intersection arrangement is still to be confirmed but would be four to six lanes (total) which tapers back to two to four lanes.

Based on the information provided to SLR, the indicative earthworks for the project are as follows:

- Volume of Cut: 19,000 m^3 (maximum depth of cut 3.5m).
- Volume of Fill: 29,000 m^3 (maximum height of fill 4.0m).

1.2 Purpose of report

The purpose of the PSI is to support the notice of requirement and regional resource consents on behalf of AT. The objective of the PSI is to provide input relating to actual or potential ground contamination effects to the construction of the project.

1.3 NES framework

This report has been prepared in general accordance with the requirements for a PSI referred to in the Resource Management (National Environmental Standard for Assessing and Managing Contamination in Soil to Protect Human Health) Regulations 2011 (NES Soil), and as outlined in the Ministry of Environment (MfE) Contaminated Land Management Guidelines No 1: Reporting on Contaminated Sites in New Zealand (updated 2011).

The PSI checklist is provided in **Appendix B**. The persons undertaking, managing, reviewing and certifying this investigation are suitably qualified and experienced practitioners as defined in the NES Soil.

2 Scope of work

The scope of works conducted in this PSI are:

- Desktop reviews which include:
  - site location and general setting;
  - site zoning;
  - geology, hydrology and hydrogeology;
  - historical aerial photographs;
  - Auckland Council Property File;
  - interviews with relevant current/previous owners (if available); and
  - Auckland Council GIS search.
- A site walk-over inspection to assess visual and/or olfactory evidence of contamination, focusing on areas of potential concern, as identified from desktop searches.
- An assessment of the potential for ground contamination based on the desktop reviews and the site walk-over inspection.
- Development of a conceptual site model to discuss the plausible source-pathway-receptor linkages.
- An assessment to whether the contaminated land requirements of the AUP-OP and the NES Soil apply to the project.
- Preparation of a PSI report summarising the findings of the desktop review, the site walkover and the conceptual site model. Provision of comments on the potential for site contamination and the human health and environmental effects.

3 Location and description

3.1 Site location and general setting

The project is situated approximately 30 km north of Auckland Central Business District and it intersects several Future Urban zoned properties. The details of these properties are provided in Table 3-1 below.

Table 3-1 Property identification

Street address	Legal description	CT	Unitary Plan Zones
1700 Dairy Flat Highway, Dairy Flat	Pt Lot 1 DP 68886	NA25A/502	Future Urban Zone
1732 Dairy Flat Highway, Dairy Flat	Pt Lot 2 DP 68886	NA25A/503	Future Urban Zone
1731 Dairy Flat Highway, Dairy Flat	Sec 5 SO 315843, Sec 6 SO 315843 Pt Lot 1 DP 101886	92357	Future Urban Zone
1738 Dairy Flat Highway, Dairy Flat	Lot 1 DP 480626	672036	Future Urban Zone
10 Old Pine Valley Road, Dairy Flat	Sec 7 SO 315843, Sec 8 SO 315843 Pt Lot 5 DP 136559	126031	Future Urban Zone
36 Old Pine Valley Road, Dairy Flat	Lot 6 DP136559	NA80C/105	Future Urban Zone
37 Old Pine Valley Road, Pine Valley	Lot 3 DP 136559	NA810C/102	Future Urban Zone
17 Old Pine Valley Road, Pine Valley	Lot 1 DP63393, Lot 8 DP 136559	NA80C/106	Future Urban Zone
1 Old Pine Valley Road, Pine Valley	Lot 2 DP 136559	NA80C/101	Future Urban Zone
146 Pine Valley Road, Pine Valley	Lot 1 DP 136559	NA80C/100	Future Urban Zone
165 Pine Valley Road, Dairy Flat	Lot 4 DP 136559	NA80C/103	Future Urban Zone

3.2 Geology, hydrology and hydrogeology

The physical settings of the project and its surrounding areas are summarised in Table 3-2 below.

Table 3-2 Physical and environmental settings

Topography	The project area is situated between 20 and 40 m New Zealand Vertical Datum (mNZVD). The highest elevation is located at the junction of Dairy Flat Highway and Pine Valley Road, then the area slopes to the north-west, north and east.
Landscape	Soil landscape in the project area comprises melanic soils, which have black or dark grey top soils that are well structured. The subsoil either contains lime, or has a well-developed structure and is neutral or only slightly acidic. Melanic soil shrinks on drying and swells on wetting.
Geology	The Geological Map of New Zealand 1:1,000,000 indicated the project area is underlain by Zealandia Megasequence Allochthonous Rocks from the Haerenga Supergroup. It comprises sandstone, mudstone and limestone, which are described to be structurally complex units of tectonically intercalated micaceous sandstone and mudstone, siliceous mudstone and minor micritic mudstone.
Acid sulfate soil	The project area is not located in or near areas of known acid sulfate soil occurrence.

Hydrogeology	The aquifer is within the coastal basin, basement hard rock system, which is anticipated to have low to poor yield and low salinity. There is no known extraction bore at or in the vicinity of the project area.

3.3 Surrounding land uses

The land uses surrounding the project area are:

- North – Area cleared of vegetation and appeared to be under construction.
- South – Vacant lands with grass cover.
- East – Northern Motorway following by mixed residential and commercial properties.
- West – Vacant lands with grass cover, with residential development on some properties.

4 Desktop review and site inspection

4.1 Historical aerial photographs review

Aerial photographs for the project were purchased from Land Insight & Resources or obtained from the Auckland Council GIS database (publicly available) and are provided in **Appendix C**. The review of aerial photographs dated from 1958 to 2017 (current) is summarised in **Table 4-1** below.

Table 4-1 Summary of historical aerial photographs review

Year of imagery	Source	Observation
1958	Land Insight & Resources	Old Pine Valley Road and Dairy Flat Highway had been constructed. The project area was predominantly vacant. There were a few farmhouses/residential dwellings to the north of Old Pine Valley Road. Vegetation to the north of Dairy Flat Highway appeared to have been cleared. There was also a development, i.e. farm/residential use along the south-east portion of Dairy Flat Highway. Two streams, likely to be tributaries of Weiti River crossed the project area.
1973	Land Insight & Resources	There was minimal to no noticeable change in land use. Argent Lane had been constructed. A few more farmhouses were notable along the northern verge of Old Pine Valley Road. A parcel of land on the eastern edge of Dairy Flat Highway appeared to have been disturbed, e.g. exposing bare ground.
1981	Land Insight & Resources	There was no noticeable change since the last aerial imagery review.
1988	Land Insight & Resources	Land parcels along Old Pine Valley Road (to the north and south) appeared to have been used for agriculture purpose. There was no noticeable change to land uses in other properties within the project area.
1996	Auckland City Council GIS database	All parcels of land to the north and south of Old Pine Valley Road had been developed; at least one farmhouse/residential dwelling and sheds were observed on these properties. The development only covered a small area of the property, with the remaining area covered with grass. There are two developments along the eastern portion of Dairy Flat Highway.
1999	Auckland City Council GIS database	The road connecting Old Pine Valley Road and Dairy Flat Highway (Pine Valley Road) had been constructed. One of the properties located to the south of Old Pine Valley Road had been relocated to make way for construction of the road. Disturbed ground (i.e. bare ground and cleared vegetation) was notable in the approximate centre of the project area (on both the east and west of Pine Valley Road).
2003/2004	Auckland City Council GIS database	The property located on the eastern corner of the Old Pine Valley Road / Pine Valley Road appeared to be used for agriculture purposes. Short shrubs/trees were used to define boundaries between different parcels of land.

Year of imagery	Source	Observation
2010/2011	Auckland City Council GIS database	The layout of the project area has remained the same since previous imagery. There are more bushes / shrubs in each property.
2017	Auckland City Council GIS database	There was no noticeable change since the previous aerial imagery.

4.2 Historical certificates of title

Review of historical certificates of title for land parcels within the project area was not considered necessary for this PSI, as the review of historical aerial photographs showed minor to no changes of land uses since 1999. Prior to 1999, the project area was either vacant or had farmhouses/residential dwellings which are still present.

4.3 Auckland Council Land information Memorandum (LIM)

Reviews of the Auckland Council Land information Memorandum (LIM) for the project area were not considered necessary because historical aerial photographs showed minor to no changes of land uses.

4.4 Site visit summary

A representative from SLR, Mr Mo Daud, conducted an inspection of the project area on 21 and 22 September 2019. In addition to conducting the site walkover inspection, Mr Daud interviewed four residential occupants at the following properties:

- 1700 Dairy Flat Highway, Dairy Flat – Ms Elaine Butler-Stoney (owner).
- 1732 Dairy Flat Highway, Dairy Flat – Mr Bruce Kidd (tenant).
- 1731 Dairy Flat Highway, Dairy Flat – Ms Grace Ren (employee of the owner, Mr Zho).
- 10 Old Pine Valley Road, Dairy Flat – Ms Shirley Richards (owner).

Mr Daud also met the owner of 36 Old Pine Valley Road, Dairy Flat (Ms Jinny Noh) but she didn't want to participate in the interview process. She, however, allowed Mr Daud to inspect her property.

SLR attempted to contact the occupants of the remaining properties but could not get in touch on the days of the inspection.

Summaries of the inspection and interviews are provided in Table 4-2.

Table 4-2 Physical and environmental settings

Property	Observation		Interview with occupants
	Site layout	Potential contaminating activity	
1 Old Pine Valley Road, Pine Valley	There was a dwelling and a large shed located in the central portion of the property. The buildings were surrounding by trees and shrubs. Other areas were grass covered. Access into the property is via a driveway entry on Old Pine Valley Road.	• As part of a farm, the dwelling and the shed may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have asbestos containing material (ACM). • Other potential contaminating activities were not apparent from observations made (from outside of the property) during the site inspection.	The site occupants could not be reached for an interview.
10 Old Pine Valley Road, Dairy Flat	The property was divided into two portions by Pine Valley Road. The eastern portion had two dwellings, trees, shrubs and garden while the western portion was covered with grass and had a barn. Overall the property was slightly undulating with a gentle slope to the south. **Photo 1** and **Photo 2** in **Appendix E** show a view of the front gate and one of the dwellings from Old Pine Valley Road and the landscape to the east of the dwelling, respectively.	• A waste (sewer) treatment facility located at the rear of the dwellings. • As part of a farm, the dwellings and the barn may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have ACM. • No other potential contaminating activities were apparent at the time of the inspection.	The current site owner (Shirley Richards) had been residing at the property for 23 years. The property was and continues to be a farm. The current dwellings were moved and constructed within its eastern portion after part of the property was acquired for Pine Valley Road around 1999.

Property	Observation		Interview with occupants
	Site layout	Potential contaminating activity	
17 Old Pine Valley Road, Pine Valley	This was a large property, however, only the southern strip (i.e. now Argent Lane) of the property falls within the project area. There was a locked gate in this area – the signs on the gate suggested Milldale Pumping Station (**Photo 3**, **Appendix E)** was located within the property, though exact location was unclear**.**	• Potential imported fill use for construction of the road. • Small dosage of chemicals used at Milldale Pumping Station. • No other potential contaminating activities were apparent at the time of the inspection.	It is understood that Fulton Hogan may have recently acquired this property, hence there is limited information available from previous occupants.
36 Old Pine Valley Road, Dairy Flat	Residential dwelling (**Photo 4**, **Appendix E**) was located in the northern portion and was surrounded by trees. An old hut/shed was also observed (**Photo 5**). There was a sump (dry at the time of inspection) for livestock water supplies (**Photo 6**).	• A waste (sewer) treatment facility (<5m^2) located at the rear of the dwelling. • As part of a farm, the dwelling and the old hut/shed may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have ACM. • No other potential contaminating activities were apparent at the time of the inspection.	Site owner/occupant (Ms Jinny Noh) did not want to participate in the interview process. However, she allowed access to her property for inspection.
37 Old Pine Valley Road, Pine Valley	There was a dwelling and a large shed located in the property. Areas surrounding these buildings were grass covered with minor shrubs.	• As part of a farm, the dwelling and the shed may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have ACM. • No other potential contaminating activities were apparent (from outside of the property) during the site inspection.	It is understood that Fulton Hogan may have recently acquired this property, hence there is limited information available from previous occupants.

Property	Observation		Interview with occupants
	Site layout	Potential contaminating activity	
1700 Dairy Flat Highway, Dairy Flat	The property appeared to be a farm with shrubs and grass around the residential dwelling – see **Photos 7-9, Appendix E**. There is an old hut (or barn) in the eastern portion of the property. At the time of site walkover, several ponies were grazing on the property. Topography of the property slopes towards the south-east. The property is fenced using wire and timber.	• A waste (sewer) treatment facility (<5m^2) located at the rear of the dwellings. • As part of a farm, the dwelling and the old hut may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have ACM. • No other potential contaminating activities were apparent at the time of the inspection.	The current owner of the house, Elaine Butley, indicated the house was built more than 40 years ago by her father.
1731 Dairy Flat Highway, Dairy Flat	The property had a gentle slope to the north towards a stream and was divided into two portions by Pine Valley Road. Residential dwelling and barns, which appeared to be built between 1960 and 1970's, were located on the eastern portion, while the western portion was grass covered and a farm – see **Photos 10 and 11**, **Appendix E**. The property was fenced with timber.	• A waste (sewer) treatment facility (<5m^2) located at the rear of the dwellings. • As part of a farm, the dwelling and the barns may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have ACM. • No other potential contaminating activities were apparent at the time of the inspection.	The interview was conducted with Grace Ren, who was the employee of Mr Zho (the owner). She indicated that Mr Zho had just acquired the property in August 2019 and she did not have any knowledge of the previous owner or previous activities at the property.

Property	Observation		Interview with occupants
	Site layout	Potential contaminating activity	
1732 Dairy Flat Highway, Dairy Flat	Residential dwelling was located in the eastern portion of the property (**Photo 12, Appendix E**). An old shed/workshop (**Photo 13**) was present to the west of the residential dwelling. Areas around the shed/workshop were also used for storage of earthwork machineries and construction materials (new and usable). In addition, construction waste and fill material were seen scattered across the western portion of the property. A large soil stockpile (covering an area of approximately 40m x 20m) was present between the shed/workshop and the property boundary along Dairy Flat Highway - see **Photo 14 (Appendix E).** The approximate location of this stockpile is shown on the preliminary draft plan in **Appendix A.**	• A waste (sewer) treatment facility (<5m^2). • Stockpile soil/material and fill material from unknown sources. • Potential leak/spill of chemicals in the in the workshop/shed. • Potential leak/spill of chemicals from machineries. • Potential ACM in buildings.	The current tenant of the property, Mr Bruce Kidd, has been renting the house for approximately three years from Wixun Holding (owned by Yijun Sun). He indicated that the land is also leased by Mr Shaun Russell. Mr Kidd also indicated that he had no knowledge of the stockpile - see **Photo 13**, **Appendix E.**
1738 Dairy Flat Highway, Dairy Flat	A landscape supplies business. A closer inspection of the property could not be carried out.	• Potential storage of fertilisers and pesticides/ herbicides within the property. • No other potential contaminating activities were apparent (from outside of the property) during the site inspection.	Could not get in touch with site occupants.

Property	Observation		Interview with occupants
	Site layout	Potential contaminating activity	
146 Pine Valley Road, Pine Valley	A large residential dwelling and a shed / garage were located in the central portion. Detailed observation of this property is limited due to presence of trees surrounding the property.	• As part of a farm, the dwelling and the shed/garage may be used for storage of fertilisers, pesticides/herbicides. These buildings may also have ACM. • No other potential contaminating activities were apparent (from outside of the property) during the site inspection.	Could not get in touch with site occupants.
165 Pine Valley Road, Dairy Flat	This property was vacant and had well maintained grass cover.	Not apparent from the observation.	Could not get in touch with site occupants.

4.5 HAIL classification

Hazardous Activities and Industries List (HAIL) is the classification of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. While the properties within the project area do not have contamination tags in the Council property records, based on review of the desktop review and site inspection, the following potential HAIL sites are identified:

Table 4-3 Potential HAIL sites

Potential contamination issues	Location / address	HAIL category	Comments related to the Project area
Chemicals such as herbicides and pesticides storage (limited quantity for non-commercial purpose) in sheds	All properties with shed/huts	A11	These potential contamination issues are outside the project area (ie. outside the proposed road corridor).
Soil stockpile (an area of approximately 40m x 20m) from unknown origin/source - approximate location is presented on the draft plan in **Appendix A**.	1732 Dairy Flat Highway, Fairy Flat	G3	This potential contamination issue is outside the project area (ie. outside the proposed road corridor). It is noted however the stockpile may abut the road corridor.
Potential filled area	1732 Dairy Flat Highway, Fairy Flat 17 Old Pine Valley Road, Pine Valley	G3	This potential contamination issue is outside the project area (ie. outside the proposed road corridor) or outside the current scope.
Waste treatment facilities (septic tanks)	All properties with treatment facilities	G6	This potential contamination issue is outside the project area (ie. outside the proposed road corridor).
Buildings with potential asbestos containing material (ACM)	All properties	E1	This potential contamination issue is outside the project area (ie. outside the proposed road corridor).

5 Regulatory Assessment

Relevant regulations associated with the assessment criteria for contaminated sites in the Auckland regions are specified in the NES Soil and the AUP-OP. The requirements for contamination related resource consents for this project has been evaluated against these two documents.

5.1 NES Soil

The applicability of NES Soil is described in Regulation 5 of the NES, when specific activities on land where a HAIL activity has or more than likely to have occurred. These activities include subdivision, land-use change, soil disturbance, soil sampling or removing fuel storage systems.

The NES soil applicability for the project area (ie. the proposed road corridor) has been assessed based on the project area (or the "land covered") that is described by one of the following:

- An activity or industry described in the HAIL is being undertaken on it.
- An activity or industry described in the HAIL has been undertaken on it.
- It is more likely than not that an activity or industry described in the HAIL is being or has been undertaken on it.

Based on the information provided regarding the proposed road corridors as well as the desktop reviews, the site inspection and interviews discussed in Section 4, this PSI has not identified any HAIL sites or activities within the Project area. It is therefore concluded that the NES Soil is not applicable to the project.

It is noted however that the NES Soil may apply to properties adjacent to the project area, in particular the property located at 1732 Dairy Flat Highway, due to the presence of stockpiled soil and fill material from unknown sources.

5.2 AUP-OP

The AUP-OP provides rules or requirements around the discharge or management of contaminants from contaminated land or land containing elevated levels of contaminants into air, into water or onto land as provided in Section E30 of the AUP-OP.

Considering HAIL sites have not been identified in the Project area, as discussed in Section 5.1, SLR considers the contaminated land rules under Section E30 of the AUP-OP do not apply to the project.

6 Conceptual site model

This conceptual site model (CSM) has been developed to determine the presence of plausible complete exposure pathways from potential sources of contamination to susceptible receptors such as humans and/or environmental values. The following sections summarise potential sources of contaminants of potential concern (COPC) at the project area along with associated potential pathways and receptors.

6.1 Potential sources and associated contaminants of potential concern

Based on the identified current and historical surrounding site uses, several potentially contaminating activities were identified to exist within properties adjacent to the Project area. The potentially contaminating activities and associated contaminants of potential concern are summarised in Table 6-1 below.

Table 6-1 Potential contaminating activities and associated contaminants of potential concern

Property use / name	Potentially contaminating activity	Contaminants of potential concern	Comment
All properties with residential dwelling or sheds	Materials used to construct residential dwellings / sheds	Asbestos containing material (ACM)	The project is unlikely to require disturbance of the existing buildings. Therefore, the likelihood of coming in contact with asbestos from the buildings is low.
17 Old Pine Valley Road - Pumping station	Chemicals used at the pumping stations	Hydrocarbons (e.g. oils) Inorganics	Activity at the pumping station is unlikely to have an effect on the project due to its distance from the project area.
1732 Dairy Flat Highway	Stockpile and fill	Hydrocarbons (TPH, PAH, VOCs) Inorganics (metals) Asbestos	Even though these stockpile and fill are outside the Project area, due to its proximity, it is recommended that laboratory testing is undertaken to assess if the property is to be a potential source of contamination – for future reference.

6.2 Potential exposure pathway

The potential exposure pathways to the identified COPC during road alignment construction works are as follows:

- Dermal contact and ingestion of impacted shallow soil and fill.
- Inhalation of dusts from impacted shallow soil and fill.

6.3 Potential receptors

The receptors of potential concern identified within the project area during construction works and future use include onsite construction and maintenance workers, general public and future site users.

A potential risk is considered to exist when a source-pathway-receptor linkage is identified.

Considering HAIL sites have not been identified in the Project area, SLR considers that there is no plausible contaminant linkage identified within the Project area - assuming that soil disturbances are not to be carried out in adjacent properties, in particular at 1732 Dairy Flat Highway, Dairy Flat.

Further intrusive assessment is required to assess whether any pathways are complete with respect to contaminants of potential concern within the property located at 1732 Dairy Flat Highway, Dairy Flat.

7 Discussion and conclusion

The findings of the desktop site history review indicate that the project area appears to have been occupied by roads (Old Pine Valley Road, Pine Valley Road and Dairy Flat Highway) since at least 1958 and the remainder of the project area appears to be vacant/open space or used for agricultural purposes. Pine Valley Road, a connecting road between Old Pine Valley Road and Dairy Flat Highway, was constructed in between 1988 and 1996.

Residential dwellings to the north of Old Pine Valley Road and south of Dairy Flat Highway commenced in the 1950's. The aerial imagery did not indicate any industrial, quarrying or landfilling activities within the project area. However, along the eastern portion of Diary Flat Highway (within the adjacent property at 1732 Dairy Flat Highway, Dairy Flat), earthwork activities have been noted due to the presence of a large stockpile (approximate area of 40m x 20m) immediately adjacent to the proposed road corridor. In addition, construction waste and fill material were seen scattered across the western portion of the property.

Other potential cause of contamination or contaminating activities identified within the immediate vicinity of the project area (i.e. within the 500 m buffer zone) includes the use of waste treatment (septic) facilities, the potential presence of fill from unknown sources, the potential presence of ACM in the dwellings and sheds, and the potential storage of farm chemicals (fertilisers and pesticides/herbicides) within the properties. It is noted that that these are not within the Project area.

Groundwater depth beneath the project area is likely to be shallow and in particular within the proximity of the surface water bodies (i.e. tributaries of Weiti River). Groundwater is expected to flow towards the surface water bodies in the central and/or northern portions of the project area.

Based on the data provided to SLR, the desktop reviews, the site inspection and interviews, it is concluded that:

- No HAIL sites or activities have been identified within the project area.
- The NES Soil does not apply to the project because no HAIL sites or activities have been identified within the Project area.
- SLR considers the contaminated land rules under Section E30 of the AUP-OP do not apply to the project because no HAIL sites or activities have been identified within the Project area.
- Based on the findings of this PSI, the potential risk to receptors such as construction and maintenance workers, general public and future site users is considered minor.
- No resource consent relating to contaminated (or potentially contaminated) land is required for this Project and therefore, the accidental discovery provisions in the AUP-OP would need to be used to manage unexpected finds with respect to ground contamination.
- HAIL sites/activities have been identified immediately outside the project area, within the property located at 1732 Dairy Flat Highway, Dairy Flat.

8 Recommendations

It is recommended that:

1. The proposed resource consent conditions include a note detailing accidental discovery protocols of the AUP-OP.
2. Prior to the project construction, prepare a Construction Environmental Management Plan (CEMP) to address any potential human health (e.g. soil, groundwater, dust and soil vapour risk) and/or environmental risks associated with the project.
3. The requirement for the following intrusive investigation should be considered, once the detailed design for the road is established where soil disturbances would extend into the property located 1732 Dairy Flat Highway, Dairy Flat:
    - Undertake an assessment of contamination status of the large stockpile identified within the property. The soil assessment should include scope to provide an indicative waste classification to address the potential that soils may need to be excavated and disposed to an appropriately licensed offsite facility.

9 Limitations

The following information will assist in understanding the uncertainties relating to the interpretation of the data obtained during this investigation and the recommendations presented in the report and help with assessment and interpretation of the report.

SLR assumes no responsibility for the quality or accuracy of data obtained from external sources, or for occurrences outside the scope of works defined in this report.

All work conducted, and reports produced by SLR are prepared for a particular Client's objective and are based on a specific scope, conditions and limitations, as agreed upon between SLR and the Client. Information and/or report(s) prepared by SLR may therefore not be suitable for any use other than the intended objective.

Before passing on to a third party any information and/or report(s) prepared by SLR, the Client is to inform fully the third party of the objective and scope, and all limitations and conditions, including any other relevant information which applies to the information and/or report(s) prepared by SLR.

It is the responsibility of third parties to investigate fully to their satisfaction if any information and/or report(s) prepared by SLR, is suitable for a specific objective.

Services were conducted in a conscientious and professional manner. The nature of the task, however, and the likely disproportion between any damage or loss which might arise from the work and any report prepared as a result and the cost of our services is such that SLR cannot guarantee that all issues of concern/contamination have been identified.

The report(s) and/or information produced by SLR should not be reproduced and/or presented/reviewed except in full.

APPENDIX A

Project Alignment

PROPOSED FUTURE ROAD CORRIDOR (FOUR LANES)

Old Pine Valley Road

Proposed roundabout
(designed by others / WOODS)

#37
Lot 3
DP 136559

#1
Lot 2
DP 136559

TP: 638.260

R75.0m

TP: 567.894

Existing house

Existing house

#10
Pt Lot 5
DP 136559

Old Pine Valley Road

TP: 486.521

#36
Lot 6
DP 136559

Existing plantation area.

Pt Lot 5
DP 136559

R200.0m

Existing stream

LAND REQUIREMENT PLANS CONTINUE
REFER TO DRAWING 402828-MM-DWG-02-CV-9231-03

TP: 238.138

#1731
Pt Lot 1
DP 101886

Existing stream

Pt Lot 1
DP 101886

Pine Valley Road

TP: 35.670

Dairy Flat Highway

PRELIMINARY DRAFT
Friday, 26 JULY 2019

PLAN VIEW

SCALE (A1) 1:1000

REV	DESCRIPTION	REVISION DATE
A	DRAFT - FOR DISCUSSION ONLY	26/07/2019

DRAFT - FOR DISCUSSION ONLY

DRAWING Q.A.

DRAWN	M.BUNKALL
CHECKED	-
APPROVED	-

DO NOT SCALE OFF THIS DRAWING.
VERIFY ALL DIMENSIONS ON SITE
BEFORE COMMENCING ANY WORK.

CONSULTANT PROJECT NO.

MOTT MACDONALD : 402828

CONSULTANT

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MOTT MACDONALD

CLIENT

MILLDALE

ROAD CONTROLLING AUTHORITY

Auckland Transport
An Auckland Council Organisation

PROJECT

MILLDALE DEVELOPMENT
INFRASTRUCTURE PROJECTS

PROJECT TYPE	PROJECT PHASE
NEW CONSTRUCTION	DETAILED DESIGN

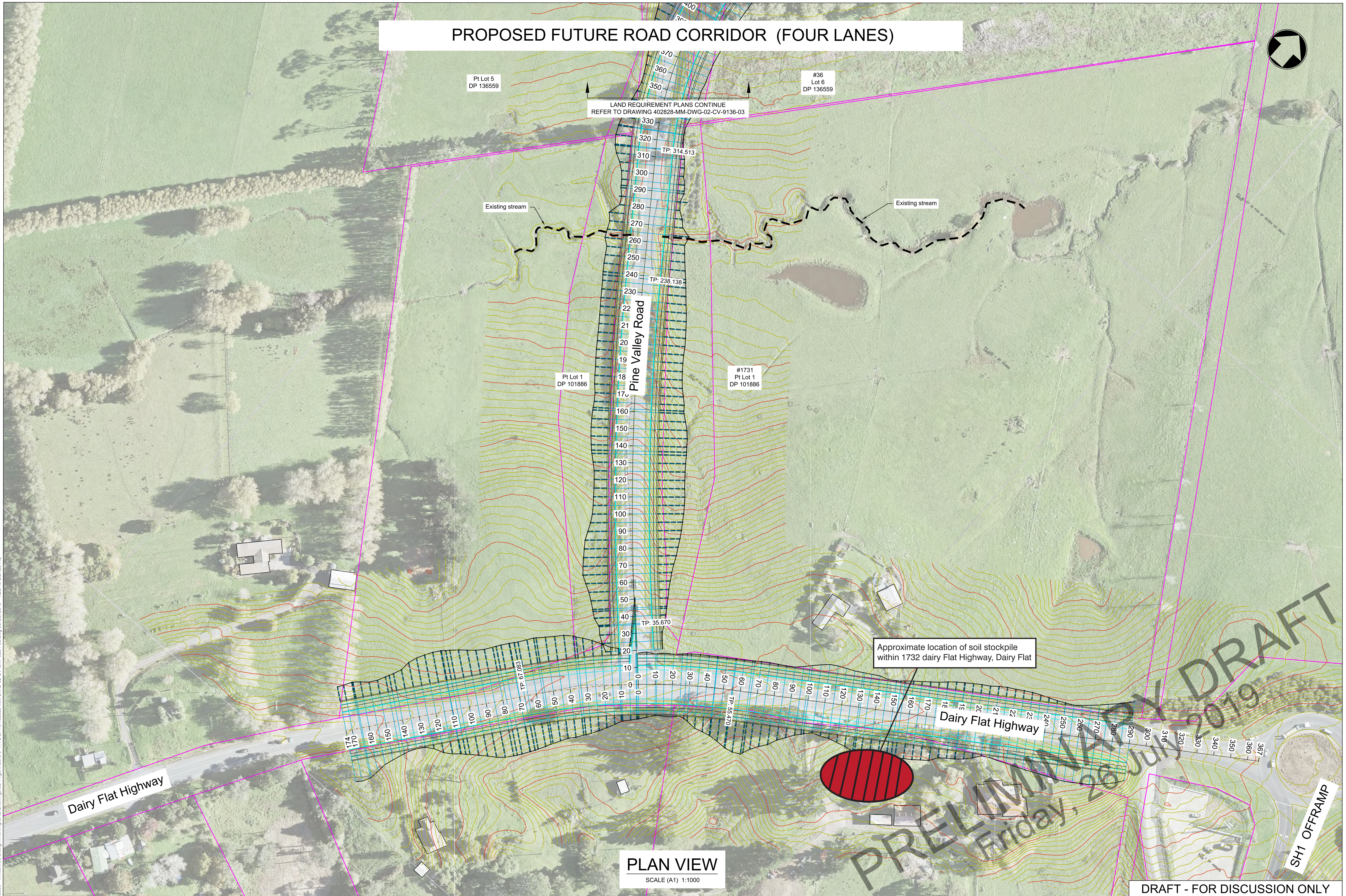
CONSULTANT PROJECT NO.
402828 Milldale

DRAWING
Milldale Development - Argent Lane to Dairy Flat h/w
Proposed Road Alignment Plan, Pine Valley Road

DRAWING NO.	REVISION
402828-MM-DWG-02-CV-SKT-9136-03	A

CONSULTATION | SCALE (A1) 1:1000

PROPOSED FUTURE ROAD CORRIDOR (FOUR LANES)



PLAN VIEW

SCALE (A1) 1:1000

DRAFT - FOR DISCUSSION ONLY

REV	DESCRIPTION	DATE
A	DRAFT - FOR DISCUSSION ONLY	26/07/2019

DRAWING Q.A.
DRAWN M.BUNKALL
CHECKED -
APPROVED -

DO NOT SCALE OFF THIS DRAWING.
VERIFY ALL DIMENSIONS ON SITE
BEFORE COMMENCING ANY WORK.

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MOTT MACDONALD

CLIENT
MILLDALE

ROAD CONTROLLING AUTHORITY
Auckland Transport

PROJECT
MILLDALE DEVELOPMENT
INFRASTRUCTURE PROJECTS

PROJECT TYPE: NEW CONSTRUCTION
PROJECT PHASE: PRELIMINARY DESIGN
CONSULTANT PROJECT NO.: 402828 Milldale

DRAWING
Milldale Development - Argent Lane to Dairy Flat h/w
Proposed Road Alignment Plan, Dairy Flat Highway

DRAWING NO. 402828-MM-DWG-02-CV-SKT-9231-03
REVISION A
CONSULTATION
SCALE (A1) 1:1000

APPENDIX B

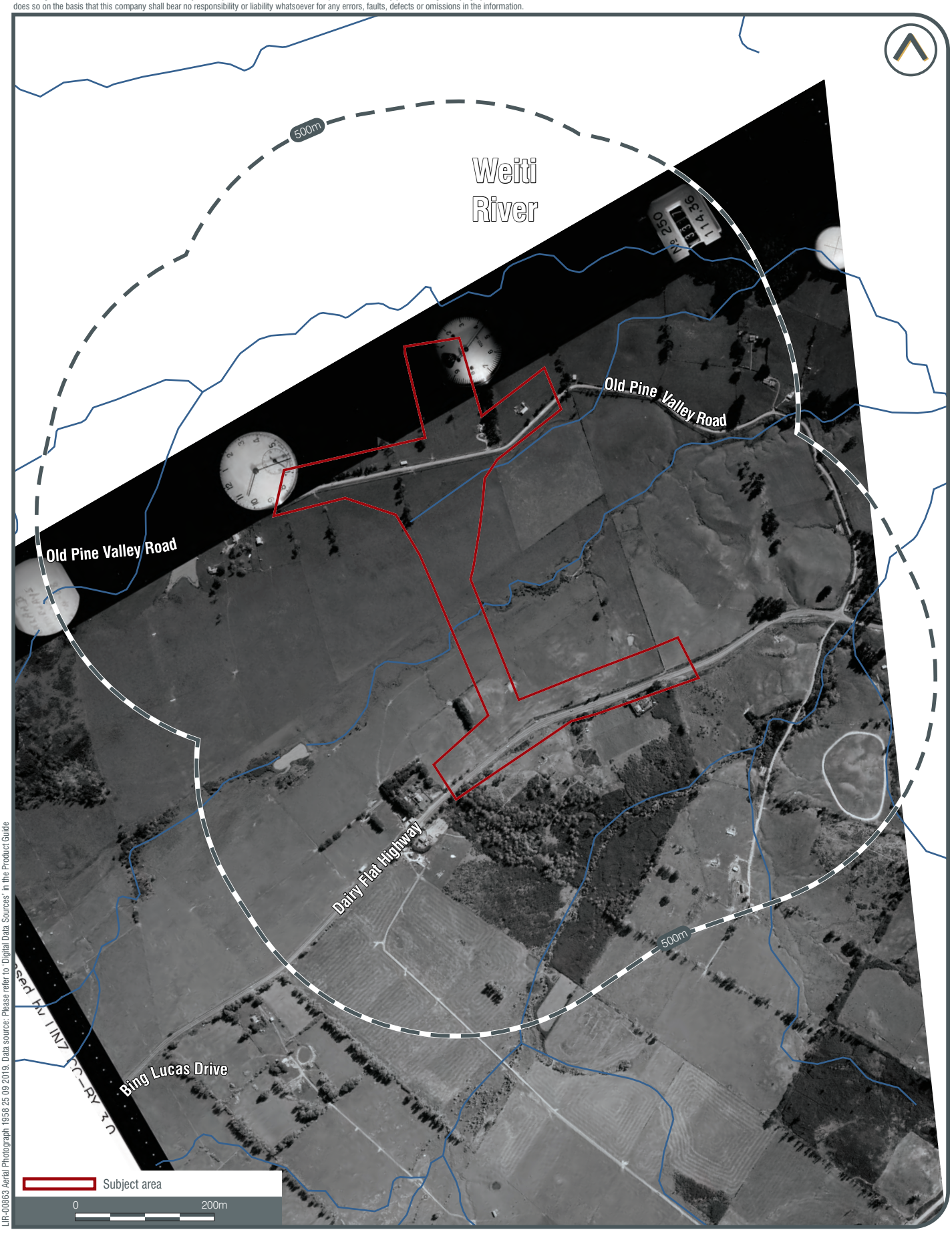
PSI checklist

Summary contaminated sites report checklist					
Indicate the report contained in this document	☒	☐	☐	☐	☐
Report sections() and information to be presented	**PSI**	**SIR**	**RAP**	**SVR**	**MMP**
Executive summary	R ☒	R ☐	R ☐	R ☐	R ☐
Scope of work	R ☒	R ☐	R ☐	R ☐	R ☐
Site identification	R ☒	R ☐	R ☐	R ☐	R ☐
Site history	R ☒	S ☐	S ☐	S ☐	S ☐
Site condition and surrounding environment	R ☒	S ☐	S ☐	S ☐	S ☐
Geology and hydrology	A ☒	R ☐	S ☐	S ☐	S ☐
Sampling analysis plan and sampling methodology	A ☐	R ☐	X	R ☐	R ☐
Field quality assurance and quality control (QA/QC)	N ☐	R ☐	X	R ☐	S ☐
Laboratory QA/QC	N ☐	R ☐	X	R ☐	X
QA/QC data evaluation	N ☐	R ☐	X	R ☐	X
Basis for guideline values	R ☐	R ☐	R ☐	R ☐	R ☐
Results	A ☐	R ☐	R ☐	R ☐	S ☐
Site characterisation	R ☒	R ☐	R ☐	R ☐	R ☐
Remediation actions	X	X	R ☐	S ☐	S ☐
Validation	X	X	X	R ☐	S ☐
Site management plan	X	X	R ☐	S ☐	S ☐
Ongoing site monitoring	X	X	X	N ☐	R ☐
Conclusion and recommendation	R ☒	R ☐	R ☐	R ☐	R ☐

Note: Basis for guideline values has not been presented in this PSI as no sampling was conducted.

APPENDIX C

Historical aerial photographs

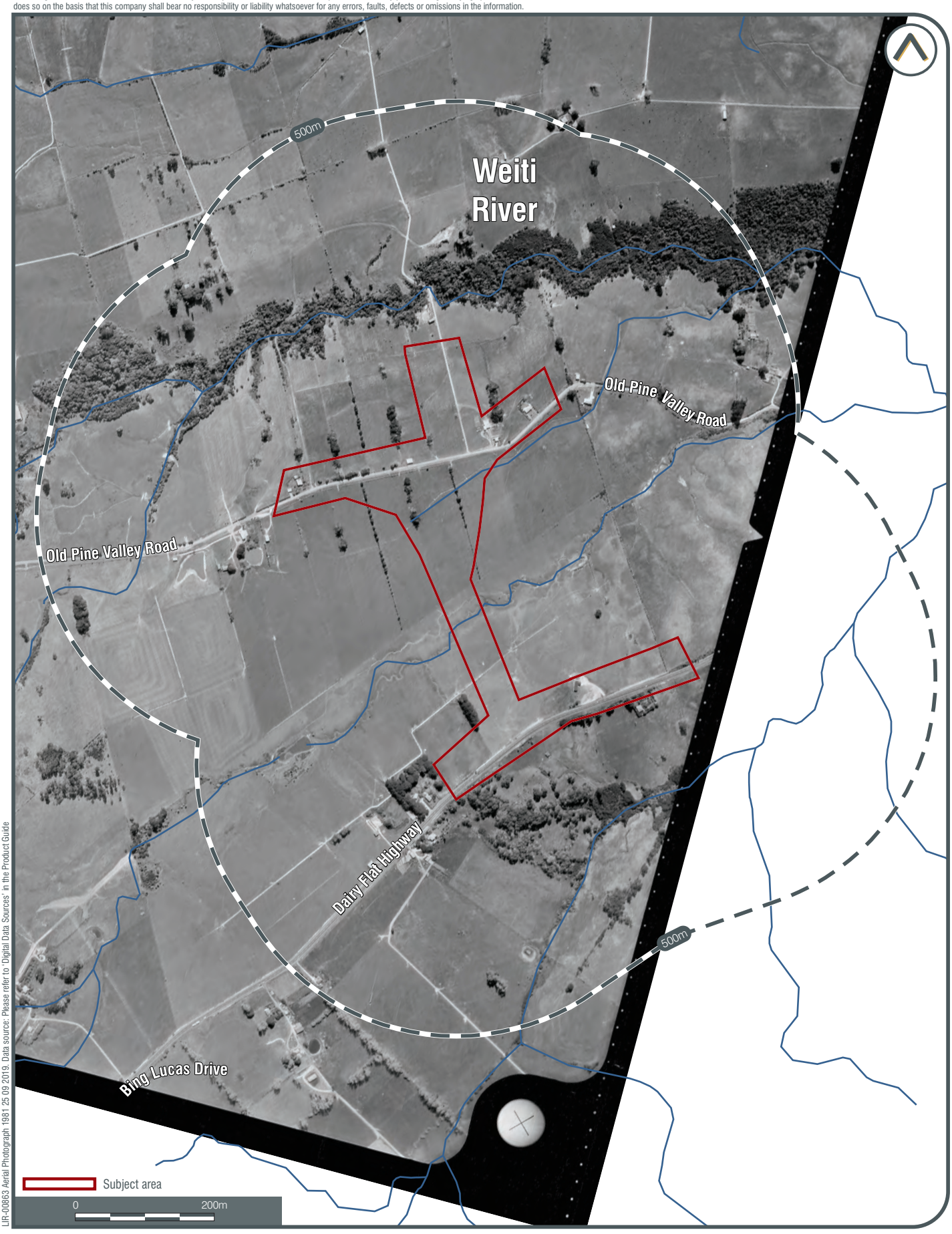


LIR-00863 Aerial Photograph 1958 25 09 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1958

LAND INSIGHT & RESOURCES

MAP 1



LIR-00863 Aerial Photograph 1981 25 09 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1973

LAND INSIGHT & RESOURCES

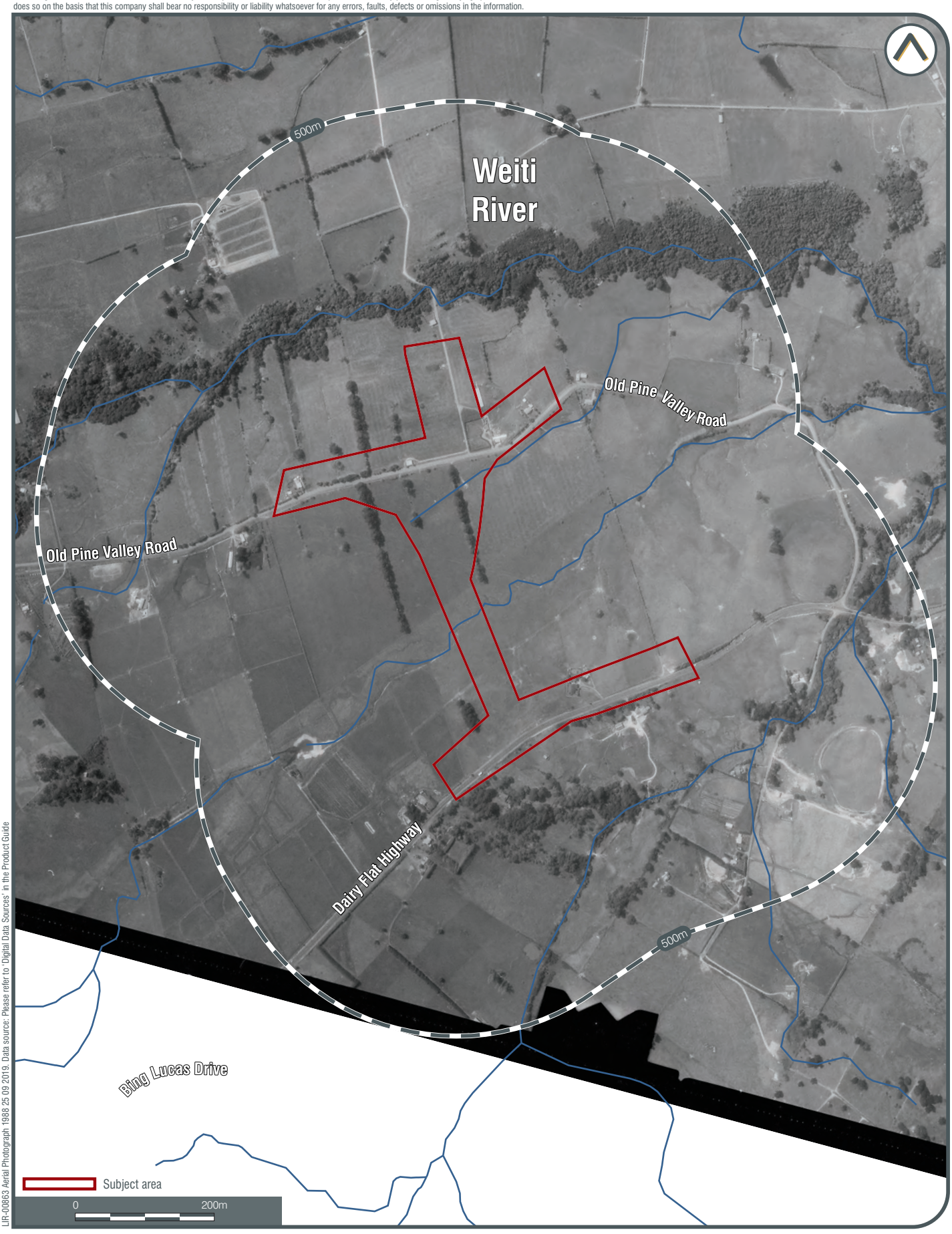
MAP 2

LIR-00863 Aerial Photograph 1981 25 09 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1981

LAND INSIGHT & RESOURCES

MAP 3



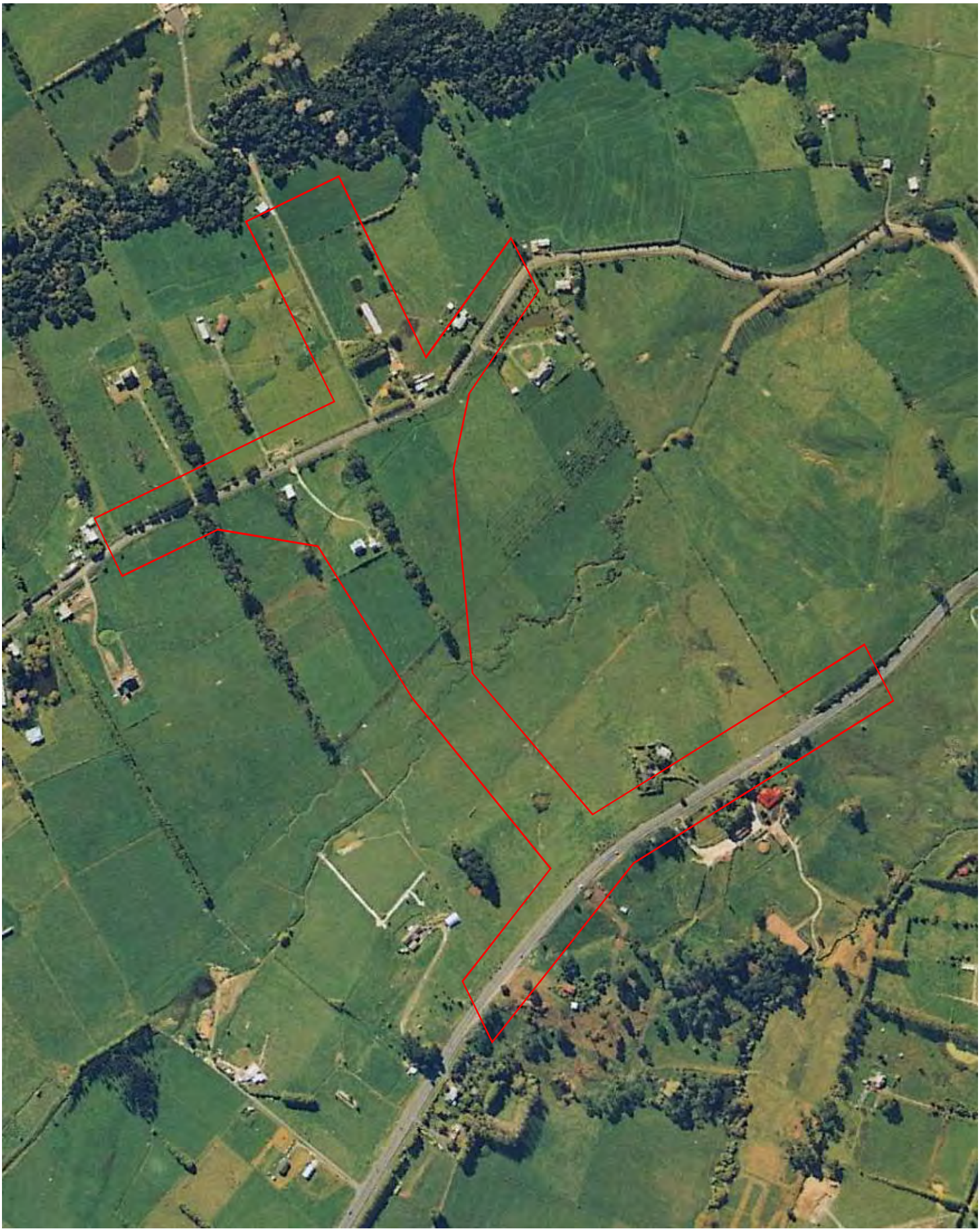
LIR-00863 Aerial Photograph 1988 25 09 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1988

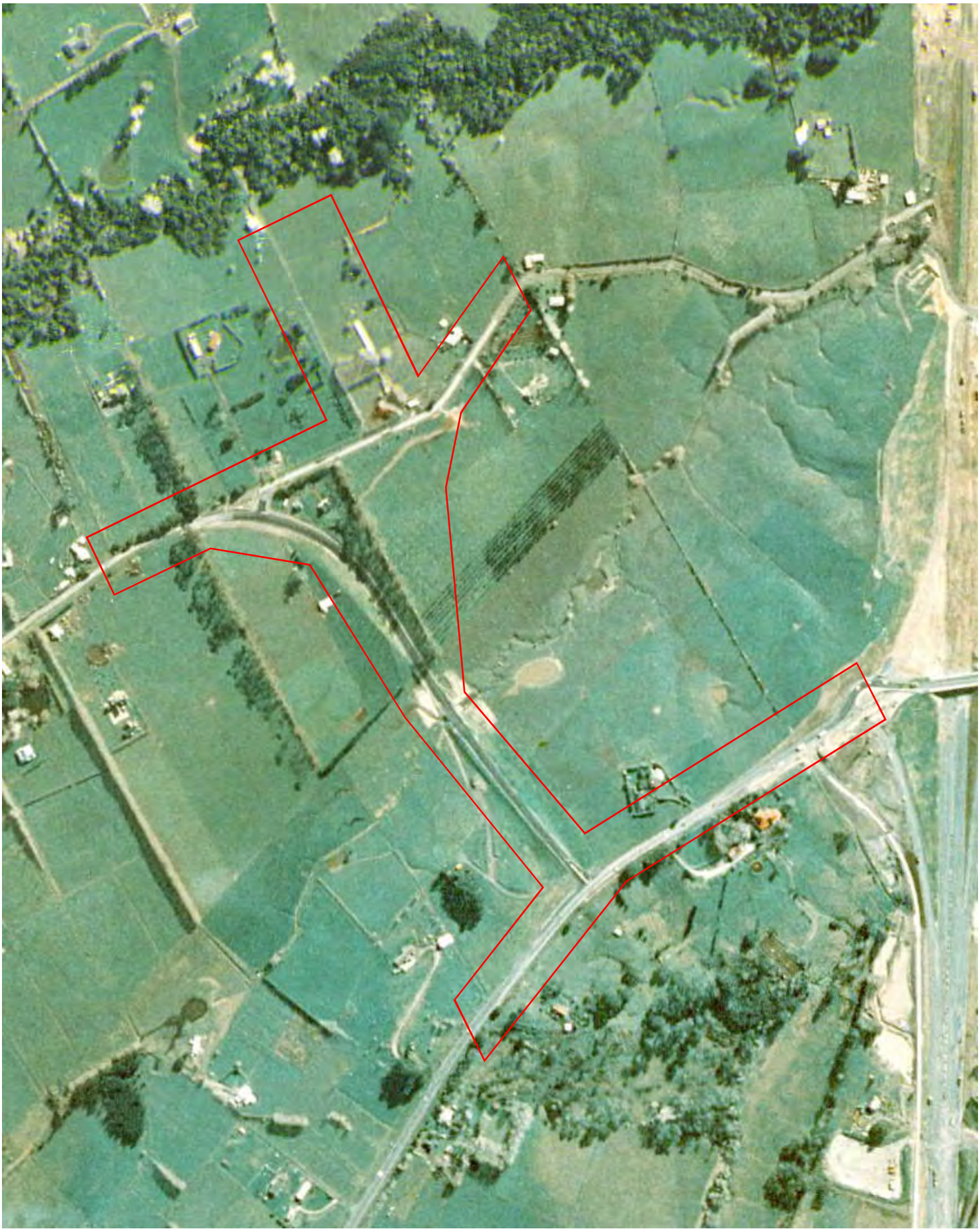
LAND INSIGHT & RESOURCES

MAP 4

Historical Aerial Photograph - 1996



Historical Aerial Photograph - 1999



Historical Aerial Photograph – 2003/2004

Historical Aerial Photograph – 2010/2011

Historical Aerial Photograph - 2017

APPENDIX D

Enviro-Screen Report by Land Insight & Resources (2019)

ENVIRO-SCREEN

Property Details

Pine Valley Road, Dairy Flat NZ

Search Date: 19 September 2019

Understanding your Report

Your Report has been produced by Land Insight and Resources (LI Resources).

Your Report is based on information available from public databases and sources at the date of reporting. The information gathered relates to land that is within a 200 to 2000 m radius (buffer zone) from the boundaries of the Property. A smaller or larger radius may be applied for certain records (as listed under records and as shown in report maps).

While every effort is made to ensure the details in your Report are correct, LI Resources cannot guarantee the accuracy or completeness of the information or data provided.

The report provided by LI Resources includes data listed on page 3 (table of contents). All sources of data and definitions are provided on the report maps and as listed in the Product Guide (Attached). For a full list of references, metadata, publications or additional information not provided in this report, please contact LI Resources at info@liresources.com.au.

The report does not include title searches; dangerous good searches or; property certificates (unless requested); or information derived from a physical inspection, such as hazardous building materials, areas of infilling or dumping/spilling of potentially contaminated materials. It is important to note that these documents and an inspection can contain information relevant to contamination that may not be identified by this Report.

This Report, and your use of it, is regulated by LI Resources Terms and Conditions (See LIR Product Guide).

Land Insight and Resources

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https://liresources.com.au/

INDEX

Section 1 - Property Setting

1.1 SITE LOCATION MAP AND SENSITIVE RECEPTORS

Map 1 (500m Buffer)

Sensitive receptor	Category	Distance (m)*	Direction
Not identified	-	-	-

*Distance from the sensitive receptor point feature to the site boundary centroid.

1.2 PLANNING CONTROLS

Map 2 (onsite)

Zoning	4 27	Future Urban Zone Strategic Transport Corridor Zone
Development plans	Structure plan	

1.3 SOIL LANDSCAPE

Map 3a (onsite)

Soil Landscape	EP	Perch-Gley	Soils	Melanic Soils
Description	Melanic Soils have black or dark grey topsoils that are well structured. The subsoil either contains lime, or has a well-developed structure and is neutral or only slightly acid. **Occurrence -** Melanic Soils occupy small areas scattered throughout New Zealand, in association with lime-rich rocks or dark (basic) volcanic rocks. They cover 1% of New Zealand. **Physical properties -** Topsoil structure is usually stable. The soils shrink on drying and swell on wetting. **Chemical properties -** Natural fertility is high. Base saturation is high with high exchangeable calcium or magnesium. The clay fraction is usually dominated by swelling (smectite) clays. **Biological properties -** These soils are biologically very active with high populations of soil organisms.			

1.4 ACID SULFATE SOIL

Map 3a (onsite)

	On the Property?	Within Record Search Buffer?
Acid Sulfate Soil Risk Maps (ASS)	Not identified	Not identified
Salinity Hazard	Very low	Very low

1.6 GEOLOGY AND TOPOGRAPHY

Map 4 (onsite)

Geology

Map Sheet	Symbol	Name	Group	Simple name	Lithology	Description
The Geological Map of New Zealand 1:1 000 000	lKeEk	Mangakahia Complex	Haerenga Supergroup	Zealandia Megasequence Allochthonous Rocks	sandstone, mudstone, limestone	Structurally complex units of tectonically intercalated micaceous sandstone and mudstone, siliceous mudstone and minor micritic limestone.

Topography

Topography	20-40 mAHD

1.7 HYDROGEOLOGY AND GROUNDWATER BORES

Map 5a (500m Buffer)

	On the Property?	Within Record Search Buffer?
Aquifer Potential	Poor - Low	Poor - Low
Wetlands	Not identified	Not identified
Groundwater Bores	Not identified	Not identified

Table 1.7.1. Groundwater Bore Details

Groundwater Bore ID	Authorised Purpose	Completion Date	Drilled Depth (m)	Final Depth (m)	SWL[1] (m)	Salinity[1]	Yield[1] (L/s)	Distance (m)	Direction
Not identified	-	-	-	-	-	-	-	-	-

Table 1.7.2. Groundwater Bore Driller Lithology Details

Groundwater Bore ID	From Depth (m)	To Depth (m)	Lithology	Description	Distance (m)	Direction
Not identified	-	-	-	-	-	-

1.8 HYDROGEOLOGY AND OTHER BOREHOLES

Map 5b (500m Buffer)

	On the Property?	Within Record Search Buffer?
Hydrogeological Systems	Coastal Basin / Basement Hard Rock	Coastal Basin / Basement Hard Rock
Other known borehole investigations (500m buffer)	Not identified	Not identified

Table 1.8.1. Other known borehole investigations (Coal Seam Gas (CSG), Petroleum Wells and Other Boreholes) (500m buffer)

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
Not identified	-	-	-	-	-	-	-

Section 2 Environmental Records Summary – Contamination and Potentially Contaminating Activities

2.1 PFAS SITE INVESTIGATIONS

Map 6 (1000m Buffer)

Site	Address	Distance (m)	Direction
Not identified	-	-	-

2.2 OTHER CONTAMINATION ISSUES

Map 6 (1000m Buffer)

Defence Sites (current and former)

Site name	Defence code	Description	RCIP*	Distance (m)	Direction
Not identified	-	-	-	-	-

*RCIP (Regional Contamination Investigation Program)

Former Gasworks Sites

Site	Location	Distance (m)	Direction
Not identified	-	-	-

Landfills (Legacy)

Site name	Description	Distance (m)	Direction
Not identified	-	-	-

Note: This is not an exhaustive list of all legacy landfills.

2.3 POTENTIALLY CONTAMINATING ACTIVITIES

Map 7a (500m Buffer)

Aviation Fuel Depots/Terminals

Site name	Description	Status	Distance (m)	Direction
Not identified	-	-	-	-

Aviation Rescue Fire Fighting Facilities (ARFF)

Site name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-

Cattle Dip Sites

Site name	Location	Status	Distance (m)	Direction	Direction
Not identified	-	-	-	-	-

Derelict Mines and Quarries

Deposit Name	Method	Description	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Dry Cleaners

Site name	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-

Liquid Fuel Depots/Terminals

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Power Stations

Site name	Owner	Primary Fuel Type	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Service Stations

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Substation / Switching Stations

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Telephone Exchanges

Site name	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-

Waste Management Facilities

Site name	Owner	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Wastewater Treatment Facilities

Site name	Operator	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Unexploded Ordnance (UXO) Sites - Department of Defence (DoD)

Site name	Site ID	Category	Description	Distance (m)	Direction
Not identified	-		-	-	-

2.4 OTHER CURRENT POTENTIALLY CONTAMINATING ACTIVITIES

Map 7b (200m Buffer)

Current Commercial and Trade Data

Site name	Category	Location	Status*	Distance (m)	Direction
Landscaping Direct Ltd	Landscaping supply store	1748 Dairy Flat Hwy, Silverdale 0992	unknown	0	onsite

*Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.

Underground Storage Tank (UST)

Premises	Tank type	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Note: This is not an exhaustive list of all UST's.

2.5 CUSTOMS-CONTROLLED AREAS (CCAs)

Map 8 (500m Buffer)

CCA General List

CCA Code	CCA Name	Address	Latest report	Distance (m)	Direction
Not identified	-	-	-	-	-

CCA Excise List

CCA Code	CCA Name	Address	CCA Type	Distance (m)	Direction
Not identified	-	-	-	-	-

Section 3 - Other Environmental Constraints

3.1 FEDERAL, STATE AND LOCAL HERITAGE

Map 9 (200m Buffer)

Historical Sites

Site Name	Site ID	Significance	Type	Distance (m)*	Direction
Not identified	-	-	-	-	-

Natural Heritage

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Built Heritage and Character

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Historic Heritage Overlay

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

3.2 NATURAL HAZARDS & COASTAL MANAGEMENT

Map 10 (500m Buffer)

Bush Fire Prone Land (BPL)

Category	On the Property?	Within Record Search Buffer?
Not identified	-	-

Flood Hazard Area

Name	On the Property?	Within Record Search Buffer?
Flood Prone Areas	Yes	Yes
Flood Plains	Yes	Yes

LAND INSIGHT & RESOURCES

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ATTACHMENT A

Report Maps

SUBJECT AREA AND SENSITIVE RECEPTORS

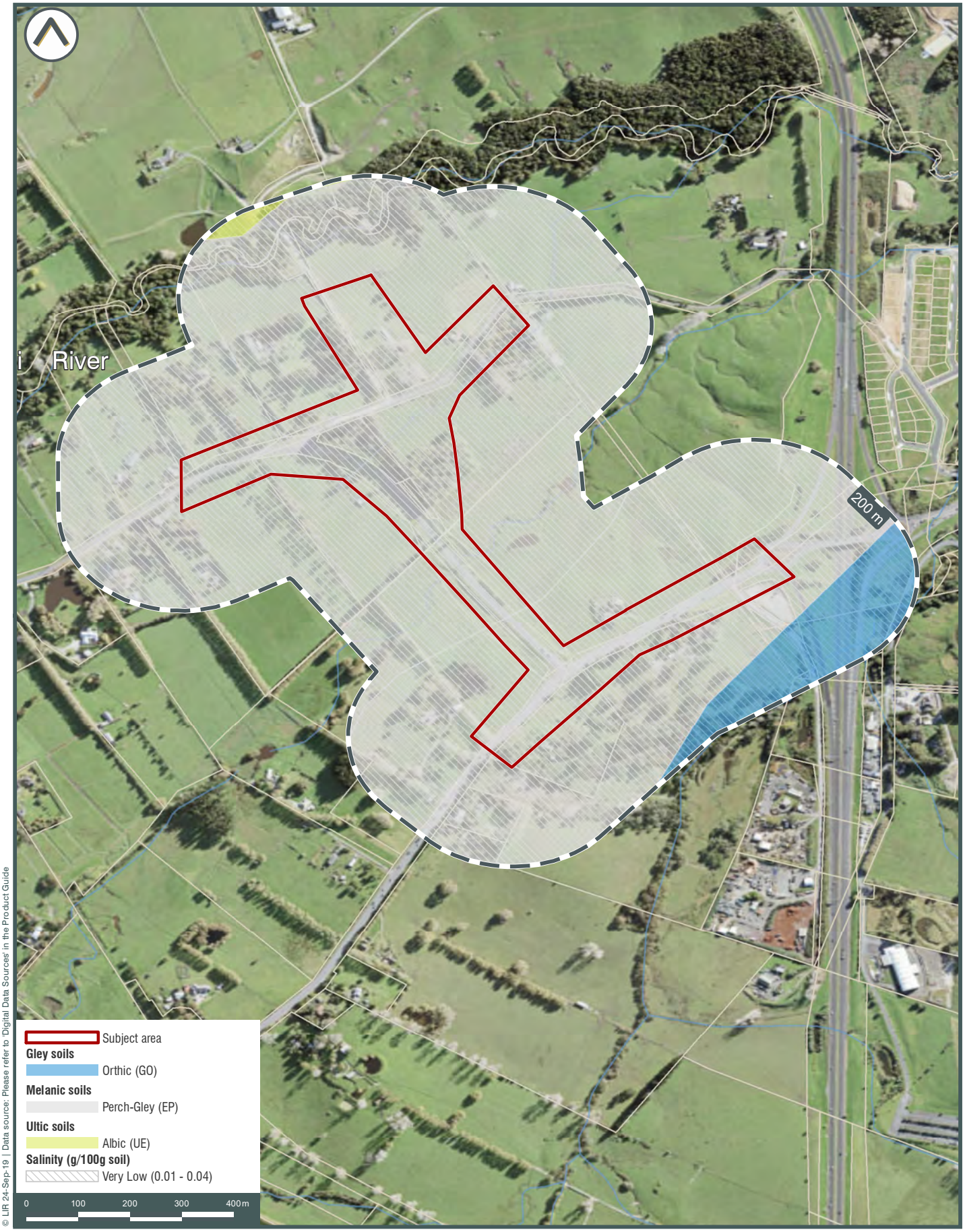
LAND INSIGHT & RESOURCES

MAP 1 Enviro-Screen

PLANNING CONTROLS

LAND INSIGHT & RESOURCES

MAP 2 Enviro-Screen



SOIL LANDSCAPES AND ACID SULFATE SOIL RISK

LAND INSIGHT & RESOURCES

MAP 3a

Enviro-Screen

GEOLOGY AND TOPOGRAPHY

LAND INSIGHT & RESOURCES

MAP 4

Enviro-Screen

HYDROGEOLOGY AND GROUNDWATER BORES

LAND INSIGHT & RESOURCES

MAP 5a

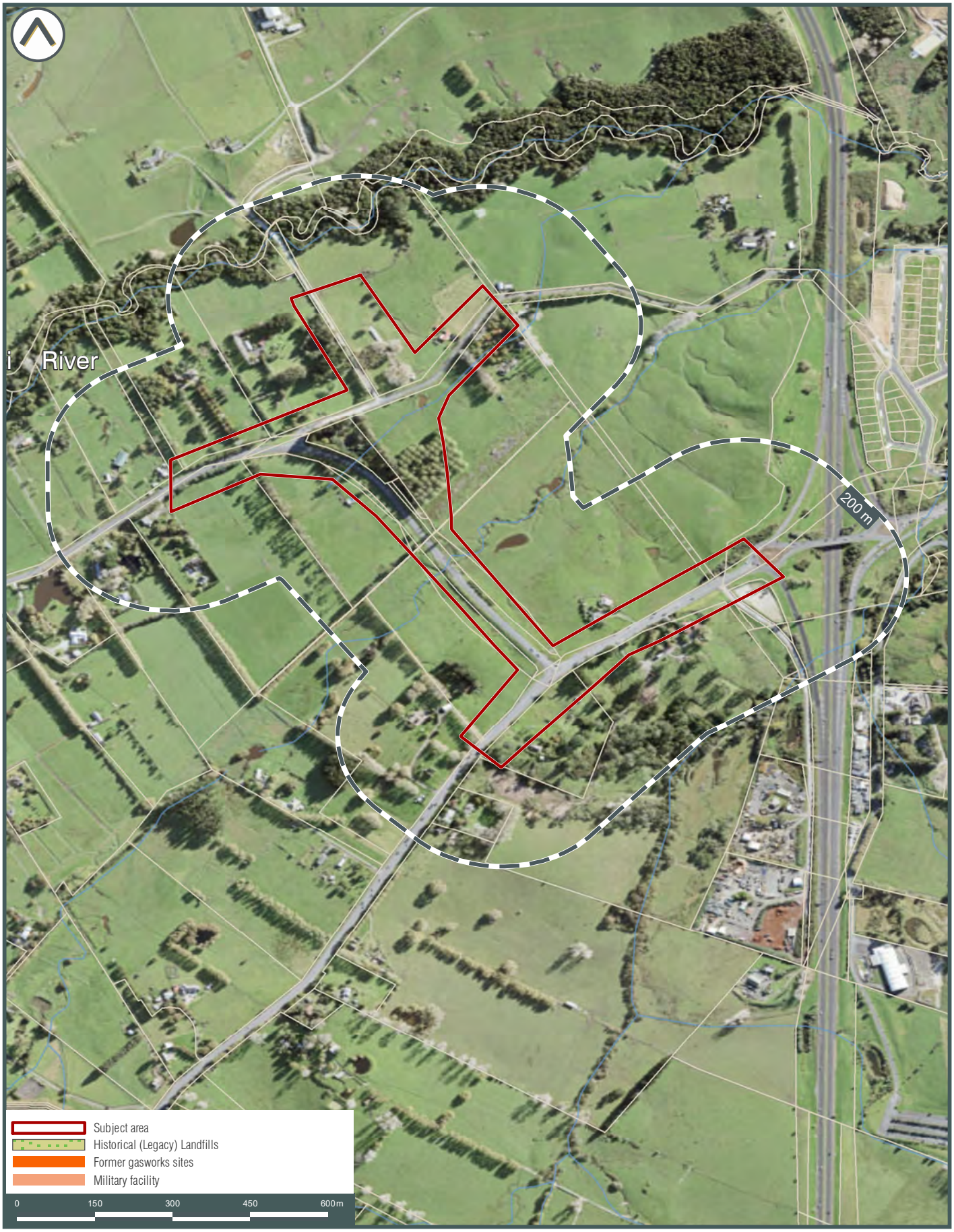
Enviro-Screen

HYDROGEOLOGY AND OTHER BOREHOLES

LAND INSIGHT & RESOURCES

MAP 5b

Enviro-Screen



OTHER CONTAMINATION ISSUES

LAND INSIGHT & RESOURCES

MAP 6

Enviro-Screen

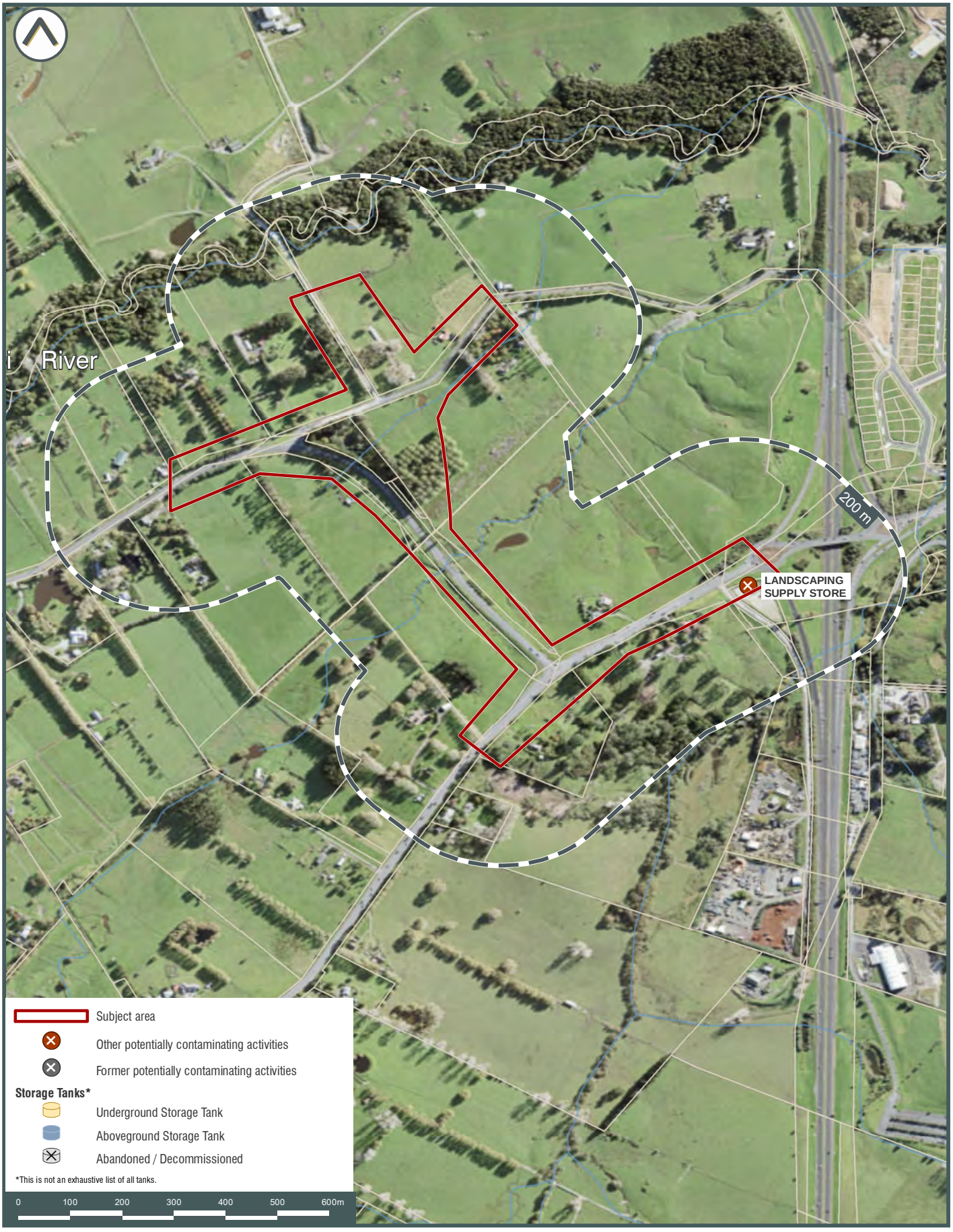
Subject area
Historical (Legacy) Landfills
Operational Service stations
Former Service stations
Operational Dry Cleaners
Former Dry Cleaners
Aviation fuel depots
Aviation rescue and fire fighting facilities
Cattle dip
Derelict mine/quarry
Liquid fuel depots
Liquid fuel terminals
Power stations
Substation locations
Telephone exchanges
Waste management facilities
Wastewater Treatment Facility

0 200 400 600 800 1,000 1,200 1,400 1,600 m

POTENTIALLY CONTAMINATING ACTIVITIES

LAND INSIGHT & RESOURCES

MAP 7a Enviro-Screen



CURRENT COMMERCIAL AND TRADE DATA

LAND INSIGHT & RESOURCES

MAP 7

Enviro-Screen

CUSTOMS-CONTROLLED AREAS (CCAs)

LAND INSIGHT & RESOURCES

MAP 8

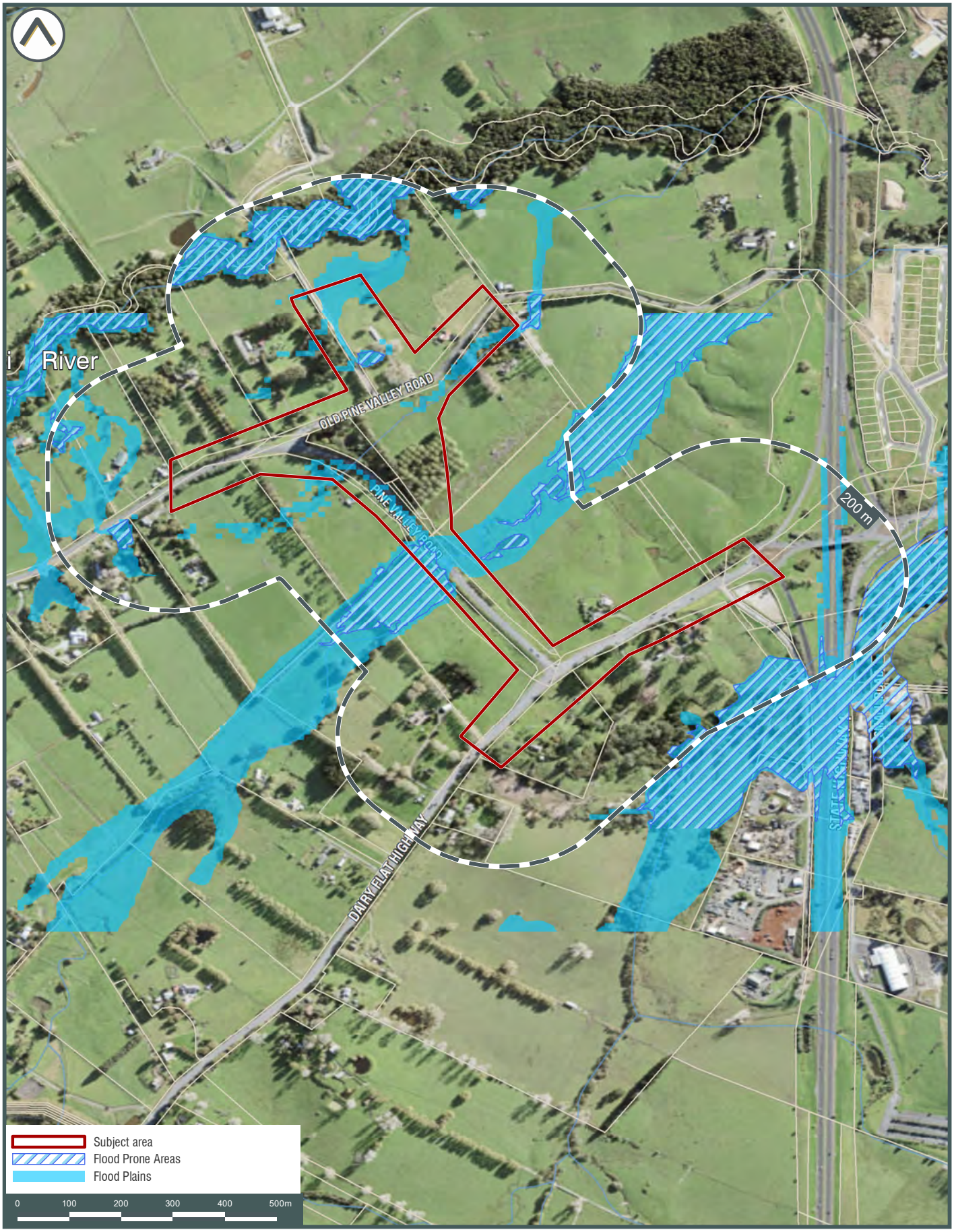
Enviro-Screen

HERITAGE

LAND INSIGHT & RESOURCES

MAP 9

Enviro-Screen



NATURAL HAZARDS

LAND INSIGHT & RESOURCES

MAP 10

Enviro-Screen

APPENDIX E

Photographs from site visit

	
Photo 1. Residential dwelling on 10 Old Pine Valley Road.	Photo 3. Gate on Argent Lane.
	
Photo 2. Garden / landscape on 10 Old Pine Valley Road.	Photo 4. Residential dwelling on 36 Old Pine Valley Road.

Photo 5. A sump (dry at the time of inspection) for livestock at 36 Old Pine Valley Road

Photo 7. 1700 Dairy Flat Highway with residential dwelling in the background.

Photo 6. The shed located on 36 Old Pine Valley Road.

Photo 8. Shed located on 1700 Dairy Flat Highway

Photo 9. The signboard “Epic 360 Civil Contracting” located on 1700 Dairy Flat Highway.

Photo 11. More sheds on 1731 Dairy Flat Higway

Photo 10. Sheds on 1731 Dairy Flat Highway

Photo 12. Residential dwelling located on 1732 Dairy Flat highway.

	
Photo 13. An old shed on 1732 Dairy Flat Highway appeared to have some chemical storages	Photo 14. Stockpile (unknown source) located on 1732 Dairy Flat highway.

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