27 March 2024

Hartley Road Partnership
c/- Patterson Pitts Group
8 Skird Street
Alexandra 9320

Preliminary Environmental Site Investigation at the Corner of Springvale Road and State Highway 8, Clyde

Our Reference: 24002

1 Introduction

Peter Dymock of Paterson Pitts Group (PPG) requested, on behalf of Hartley Road Partnership, that JKCM Ltd, trading as Insight Engineering (IE), undertake a preliminary environmental site investigation (PSI) of the property at the northern corner of the intersection of Springvale Road and State Highway 8, Clyde (herein referred to as "the site") as outlined in our Short Form Agreement (reference P24002, fully executed on 2 February 2024).

Figure 1 (under Appendix 1) indicates the location of the site, which we understand is proposed to be the subject of a Private Plan Change application to rezone the site from Rural to Industrial. A plan provided by PPG is provided in Appendix 2.

The purpose of this PSI was to assess the suitability of the site for industrial / commercial use, according to the Resource Management (*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*) Regulations[1] (herein referred to as the NES). This investigation was undertaken in general accordance with the Ministry for the Environment (MfE) *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand* [2].

2 Objectives of the Investigation

The objective was to determine if potentially contaminating historical activities pose an unacceptable risk to human health if the land was to be used for industrial or commercial purposes.

2.1 Approach

IE completed the following scope of work to satisfy the investigation objectives:

2.1.1 Review of Site Information

Several sources were contacted for information relating to the sites past and present uses and to identify any other environmental issues which may be on record. This consisted of:

- Undertaking a walkover inspection of the site, as well as the immediate surrounding area, to describe current conditions and assess whether any visual or olfactory evidence of contamination is present at the site;
- Interviewing the current owner of the property, to obtain information relating to potentially contaminating activities that may have been undertaken at the site and surrounding area;
- Review of publicly available data describing the local geology and hydrogeology;
- Review of the Otago Regional Council Hazardous Activities, Industries and Bore Search database in terms of any property specific records of hazardous activities or industries that are held in their database of potentially contaminated sites;
- Reviewing the Central Otago District Council NES Records Search statement to determine whether any records of contamination at the site are held in their database;
- Reviewing the current and historical Certificates of Title; and
- Reviewing publicly available historical aerial photographs and maps of the site and surrounding area.

3 Site Description

Site information is summarised in Table 1.

Table 1: Site Information

Location	Northern corner of Springvale Road and State Highway 8
Legal Description	Section 1 Block XXXIV Town of Clyde, Part Block XXXIV Town of Clyde, Part Block XXXIII Town of Clyde, Block XXXII Town of Clyde and Part Block XXXI Town of Clyde
Property Ownership	Leon Francis Van Boxtel, Jane Marie Scott, Christine Elizabeth Ramage and Lianneke Mechelina Adriana Lodge
Current Site Use	Firewood production
Proposed Site Use	Industrial / Commercial
Site Area	Approximately 65,901 m² (6.5901 ha)
Territorial Authorities	Central Otago District Council (CODC) Otago Regional Council (ORC)
Zoning	RU (RR): Rural Resource Area and Rural Residential

The site setting is summarised in Table 2.

Table 2: Site Setting

Topography	The majority of the site is either flat or slopes gently towards the south. The northern and north eastern portion of the site rises moderately to steeply towards the north.
Local Setting	The site is located on the eastern fringe of Clyde. The surrounding area consists generally of disused land (north), a cemetery (east), standard residential (west, beyond SH8) and commercial (south, despite the area being zoned Rural Residential).

Table 2: Site Setting (cont.)

Nearest Surface Water & Use	The Clutha River / *Mata-Au* is located approximately 930 m south west of the site. The Clutha River / *Mata-Au* is used as a source of potable water as well as for recreational, electricity generation and irrigation purposes.
Geology	The GNS New Zealand Geology Webmap[3] indicates that the site is located within the Late Pleistocene river deposits geological unit, described as "*Unweathered to slightly weathered, loose, sandy to silty, well rounded gravel usually on large outwash plains*". The surface material observed during the site visit is broadly described as light brown sandy, silty gravel.
Hydrogeology	According to a report completed by ORC[4], the site is located within the unconfined Dunstan Flats Aquifer which consists of highly permeable sandy gravel. Groundwater is considered likely to flow towards the south west at a RL of 141 m above mean sea level (amsl), which is approximately 30 m below ground level (bgl).
Groundwater Abstractions [5]	No groundwater abstraction permits were found to be located within 250 m of the site boundaries.
Discharge Consents [5]	No current or historical discharge consents have been approved for properties within 250 m of the site.

3.1 Current Site Conditions

Claude Midgley of IE completed a site walkover inspection on 8 February 2024. Observations made at that time are summarised in Table 3 and photographs are presented in Appendix 3.

Table 3: Current Site Conditions

Visible signs of contamination	A small stockpile of treated timber boards and pegs was observed on the eastern side of a caravan located in the north eastern portion of the site. The treated timber covered an area estimated to be less than 10 m^2. Stockpiles of imported soil were observed in the south eastern portion of the site. Two small oil stains were observed in the area near to the caravan and another oil stain was observed in the area where four engine oil containers were stored near to the firewood production area west of the caravan. No other indicators of contamination were evident within the site boundaries.
Surface water appearance	No surface water was present at the time of the site walkover inspection.
Current surrounding land use	Residential, commercial and reserve land surrounds the property.
Local sensitive environments	No sensitive environments are located within 200 m of the site.
Visible signs of plant stress	Apart from evidence of dry, summer conditions, no visible signs of plant stress were noted.

3.2 Interview with Current Owner

Leon Van Boxtel (*pers. comm.*), owner of the site, provided the following information:

- Mr Van Boxtel's parents, Franciscus and Francisca Van Boxtel, owned the site until he and the other owners inherited the land in 2003.
- Mr Van Boxtel's parents managed a poultry farm that included use of the site until 1980.
- No rabbit control has been undertaken, and no waste has been buried, at the site.
- As far as Mr Van Boxtel is aware, none of the activities undertaken at the site could have resulted in contamination impacts.

3.3 Certificates of Title

Historical Certificates of Title (Appendix 4), provided by PPG, were reviewed by IE. Note that not all text could be deciphered due to the high contrast of the scanned images which resulted in loss of parts of the letters in some words. Ownership records indicate the following:

1872: James Hazlett purchased a property that includes the site. According to The Cyclopedia of New Zealand[6], Mr Hazlett conducted a large general merchant business in the Otago goldfields between 1863 and 1878, after which he moved to Dunedin to join a Mr Mackerras in the firm of Mackerras and Hazlett (merchants and importers).
1914: Transmission to Bridget Agnes, William Thomas Hazlett and Luke Clyde Hazlett.
1915: Transmission to William Thomas Hazlett and Luke Clyde Hazlett.
1954: Transmission to Luke Clyde Hazlett as survivor.
1964: Transfer to William Lewis Holdom, a carpenter from Clyde.
1964: Transfer to Roy Walker, a farmer from Alexandra.
1965: Transfer to Franciscus Antonius Van Boxtel, a poultry farmer from Clyde and Francisca Martina Van Boxtel, his wife.
1980: Transfer to Francisca Martina Van Boxtel as survivor.
1984: Gazette Notice declaring part of the land (2,005 m^2) is acquired for road and shall vest in the Crown.
1995: Transfer to Leon Francis Van Boxtel, a pipelayer from Clyde, Jane Marie Scott, a married woman from Kurow, Christine Elizabeth Ramage, a married woman of Clyde and Lianneke Mechelina Adriana Lodge, a married woman from Christchurch.

3.4 ORC Property Database

IE reviewed the ORC Hazardous Activities, Industries and Bore Search database[7] on 7 February 2024. The search confirmed that the site is not recorded on the database.

The nearest property recorded on the database is locate approximately 275 m south east of the site:

- An orchard at 52 Springvale Road (HAIL.02009.01) is recorded due to the presence of an orchard. The property has not been investigated, but contamination impacts (if any) are not considered likely to have the potential to migrate to the site.

3.5 CODC NES Records Search

The NES Records Search (Appendix 5) completed by Adam Vincent, Planning Officer - Consents, on 14 February 2024. The following information was provided:

- No resource consents are associated with the site.
- Seven building consents were issued between 1958 and 1972 for the construction of a poultry house, two egg rooms with an associated packing and store room, two hen houses, additions to the existing poultry house and a shed.
- Council's aerial photographs, dating back to 2003, indicate the presence of stored timber (2023 photograph).

The NES Records Search also confirms that no preliminary or detailed site investigations could be found on the property file.

3.6 Review of Historical Aerial Photographs and Maps

Photographs in the Crown Collection[8] and Google Earth[9], as well as topomaps on the MapsPast[10] website, have been reviewed to obtain information on the past uses of the site. Aerial photographs taken between 1958 and 2023, as well as maps created between 1929 and 2019, have been reviewed. Table 4 summarises the features visible in each image.

Table 4: Historical Aerial Photographs

1929 [10]	The site, which contains the letter 'E' from the label for Clyde, is located near to the north eastern town belt which is indicated by a dark black line broken intermittently by single black dots. A railway line is located south and west of the site. A creek towards the south east is labelled "Mutton Town Gully". No significant features are visible at the site or in the surrounding area.
1939 [10]	No significant changes are apparent at the site or in the surrounding area.
1949 [10]	The railway line is now depicted with a thick black line. No significant features are visible at the site or in the surrounding area.
1958 [8]	The site is visible as an undeveloped area between the Clyde Cemetery and the town of Clyde. Springvale Road, which extends unbroken into Clyde, is visible at the southern site boundary. A water race is visible in the norther portion of the site. In the surrounding landscape, the cemetery is visible towards the east. The land on the southern side of Springvale Road appears to be used for growing pasture as linear features likely to represent flood irrigation mounds are visible in that area. There are no other significant features at the site or in the surrounding area.
1966 [8]	Two rows of poultry shelters are visible at and near to the north western site boundary. The shelters are visible as small square objects and several of them are located on the adjacent land towards the west, which is now State Highway 8. Tracks are visible between the poultry shelters and a large rectangular building located approximately 145 m west of the western site boundary. Linear features resembling flood irrigation mounds have been established across approximately the southern half of the site, however the mounds do not extend into the south eastern corner of the site. No other significant features are visible at the site or in the surrounding area.
1968 [8]	The poultry shelters have been repositioned so that all but two are located in two rows near to the centre of the site, within the area where flood irrigation mounds are visible. No other significant features are visible at the site or in the surrounding area.
1969 [10]	A water race is marked with a blue line in the northern portion of the site. The blue line includes blue arrows pointing towards the west. The cemetery is labelled towards the east of the site and black squares in the area west of the site indicate the presence of buildings. Springvale Road is marked as 'Hartley Road' and the railway line is visible as a bold black line with intermittent dashes perpendicular to the line. No other significant features are visible at the site or in the surrounding area.
1974 [8]	The row of poultry shelters has been moved again. This time, the shelters are positioned in one row at the original location of the shelters in the 1966 photograph. Apart from scrub vegetation growing further south of the water race than in the previous photograph, there are no other significant changes at the site or in the surrounding area.

Table 4: Historical Aerial Photographs (cont.)

1976 [8]	No significant changes are apparent at the site or in the surrounding area.
1977 [8]	No significant changes are apparent at the site or in the surrounding area.
1978 [8]	The row of poultry shelters has been shifted towards the south west and is no longer present on the site. The south eastern corner of the site has been covered with a large, light-coloured stockpile resembling gravel. The neighbouring property towards the south has been cleared of vegetation and covered with a light-coloured material resembling gravel. No other significant changes are apparent at the site or in the surrounding area.
1979 [8]	The gravel stockpile in the southern eastern corner of the site has halved in size. The neighbouring property at the western boundary (State Highway 8) has been covered with a light-coloured material resembling gravel. Gravel is also visible on the site, extending between 40 and 50 m east of SH8 in the south western two-thirds of the site. Further south of the site, the asphalt-sealed portion of SH8 is visible extending towards the south east. No other significant changes are apparent at the site or in the surrounding area.
1979 [10]	Apart from the realignment of Sunderland Street towards the north east, along the north western site boundary and a new road between the site boundary and the railway line, there only other significant change is a black square which indicates the presence of a building on the southern property.
1981 [8]	The gravel stockpiles no longer being present on the site. The intersection of Springvale Road and SH8 has been formed and SH8 is completely sealed beneath asphalt. A large rectangular building has been constructed on the neighbouring property towards the south. A railway line with a few train carriages is visible east of the large rectangular building. No other significant changes are apparent at the site or in the surrounding area.
1982 [8]	No significant changes are apparent at the site or in the surrounding area.
1984 [8]	A new track has been established between Springvale Road and the south western corner of the site. The track terminates at a light-coloured rectangular area that appears to have been cleared of vegetation. No other significant changes are apparent at the site or in the surrounding area.
1985 [8]	No significant changes are apparent at the site or in the surrounding area.
1989 [10]	There are no significant changes compared with the 1979 map.
1999 [10]	There are no significant changes compared with the 1989 map.
2005 [9]	The majority of the site remains undeveloped. The light-coloured rectangular area visible in the 1985 photograph is no longer present. Three soil stockpiles, an unidentifiable narrow rectangular object, a vehicle / caravan and additional smaller unidentifiable objects are visible in the south eastern corner of the site, where the gravel stockpiles had been placed in 1978. New dwellings have been constructed in the area west and south west of the site. No other significant changes are apparent at the site or in the surrounding area.
2007 [9]	With the exception of a vehicle and two unidentifiable objects in the area south west of the stockpiles, there are no significant changes apparent at the site or in the surrounding area.
2009 [10]	There are no significant changes compared with the 1999 map.

Table 4: Historical Aerial Photographs (cont.)

2010 [9]	The image is in monochrome. The south eastern portion of the site remains relatively unchanged. A track has been established between the site entrance and the water race in the north western portion of the site. The water race appears to have failed in the area where the track terminates. The lighter-coloured ground surface in that area suggests that reconstruction works may have been undertaken to repair the water race. No other significant changes are apparent at the site or in the surrounding area.
2011 to 2019 [9]	The south eastern portion of the site becomes progressively more utilised between 2011 and 2019. The area is covered with additional gravel, two orange-brown stockpiles of material resembling sawdust or firewood appear, truck trailers are parked near to the south eastern corner of the site, two caravans are parker near to the north eastern corner of the site. Additional soil stockpiles are placed west of a track that leads from the site entrance to the western portion of the site. By the end of 2019, only one caravan and the soil stockpiles remain. Long dark-coloured linear objects resembling water pipes are visible in the western portion of the site. No other significant changes are apparent at the site or in the surrounding area during this time.
2019 [10]	Apart from Springvale Road being labelled, there are no other significant changes compared with the 2009 map.
2021 [9]	With the exception of the dark linear objects no longer being located on the site, no significant changes are apparent at the site or in the surrounding area.
2023 [9]	Several vehicles are visible in the area west of the caravan at the north eastern corner of the site. Several felled trees are visible in stacks further west of the vehicles. The stacks of timber are surrounded by stockpiles of orange-brown material resembling firewood. No other significant features are visible at the site or in the surrounding area.

3.7 Summary of Identified Hazardous Activities and Industries

The following activities noted on the MfE Hazardous Activities and Industries List [11] (HAIL) have been identified at the site during review of the site history:

Category A17 – Storage tanks or drums for fuel, chemicals or liquid waste.

- This category is represented by the presence of small (~20L) containers of engine oil stored on site. The risk to health from these sources is considered to be low.

Category A18 – Wood treatment or preservation including the commercial use of anti-sapstain chemicals during milling, or bulk storage of treated timber outside.

- This category is represented by the presence of small stockpile of treated timber posts adjacent to the caravan near to the north eastern corner of the site. The risk to health from this source is considered to be low because of the limited scale of the potentially impacted area and the low likelihood of food to be grown in that area for human consumption.

Category G5 – Waste disposal to land.

- This category is represented by the importation of soil from unknown sources and placement of the soil in stockpiles on the site. The risk to health from these sources is unknown.

According to Regulation 5 of the NES, the Regulations apply if a HAIL activity has been undertaken, or currently is being undertaken on the property.

4 Preliminary Contamination Screening

To ascertain whether any indicators of gross contamination were present at the site, ten soil samples were collected from areas of interest then scanned by E3 Scientific using a calibrated X-Ray Fluorometer (XRF) to estimate the heavy metals concentrations.

XRF works based on the principle of the interaction between X-rays and atoms in a sample. When a material is exposed to X-rays, it undergoes a process called X-ray fluorescence. This process helps identify and quantify the elements present in the sample. The technique is widely used in various fields, including geology, archaeology, environmental science and materials science for non-destructive and rapid elemental analysis of diverse samples.

The accuracy of XRF analysis using a portable machine is generally considered to be quite good, but the level of accuracy can vary depending on several factors including calibration standards, the composition of the sample matrix, sample homogeneity and environmental conditions such as soil moisture.

XRF Survey

The following was undertaken during the XRF survey:

- IE collected samples from the areas of interest at the site (refer to Figure 2) using a new pair of nitrile gloves for each sample. The equipment (hand trowel) was decontaminated using a triple wash procedure with potable water, Decon 90 solution and deionised water between samples. The samples were placed directly into new ziplock bags and labelled with the name corresponding to each individual sample location. The bags were agitated in an attempt to homogenise the samples.
- Samples were delivered to E3 Scientific staff who completed the XRF scans and provided IE with data for a suite of heavy metals (As, Cu, Cr, Pb, Ni and Zn).
- Areas of interest (refer to Figure 2) are summarized as follows: SP (soil stockpile); TT (treated timber storage area); PP1 (poultry pen); NCB (north corner background).

4.1.1 Quality Assurance / Quality Control

The quality assurance / quality control (QA / QC) procedures employed during the works included:

- E3S calibrated the XRF before and after scanning the samples; and
- During the site investigation every attempt was made to ensure that cross contamination did not occur through the use of the procedures outlined within this document.

4.2 Investigation Criteria

4.2.1 Soil Criteria

Human Health Criteria

The investigation criteria referenced in this report have been selected from the NES to assess risks to human health. Where a soil contaminant standard (SCS) was not available, the hierarchy detailed in the MfE *Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values*[12] was used to select applicable criteria.

SCSs, or other appropriate criteria for industrial / commercial land use have been selected considering the proposed end use of the site. Industrial / commercial SCSs were also used to assess the risks to human health during the disturbance of soil associated with excavation activities such as installation / maintenance of underground services and other construction works required as part of the site development.

Ecological Health Criteria

Landcare Research and Hawke's Bay Regional Council produced a report[13] which updates the database of naturally occurring (referred to as background) concentrations of heavy metals in New Zealand. The database provides a range of expected concentrations of selected heavy metals in New Zealand, accessed online via an interactive map interface. XRF results less than the upper estimates for each of the heavy metals in the database, at the site location, are considered to qualify as 'cleanfill' according to the MfE definition[14]. Furthermore, the background concentrations represent criteria that are considered appropriate for the protection of ecological receptors.

4.3 Results

4.3.1 Soil Encountered

Near surface soil encountered across the majority of the site was described as light brown sandy silty gravel.

4.3.2 XRF Survey

Table 5 compares the estimated soil contaminant concentrations in the samples with the adopted investigation criteria described in Section 4.2.1.

Table 5: XRF Estimates Compared with Investigation Criteria

Analyte	Investigation Criteria		Investigation Results									
	Ecological Health Criteria	Human Health Criteria	SP1	SP2	SP3	SP4	SP5	SP6	SP7	TT1	PP1	NCB
Land Use	Predicted Background Concentrations (Cleanfill Criteria) [A]	Industrial / Commercial and Excavation Activities [B]										
Heavy Metals												
Arsenic	5.9	70	9	11	10	10	9	9	15	32	9	4
Chromium [D]	25	6,300	ND	ND	97	ND	ND	ND	ND	ND	ND	60
Copper	23.5	>10,000	ND	ND	ND	ND	ND	ND	10	22	ND	8
Lead	17.2	3,300	23	18	12	8	17	8	9	84	14	16
Nickel	14.3	6,000 [C]	ND	ND	12	ND	13	10	22	ND	14	14
Zinc	62.9	400,000 [C]	58	35	67	54	59	42	70	81	55	36

Notes:

All values in mg/kg.

Bold text indicates concentration exceeds the Industrial / Commercial and Maintenance / Excavation Criterion.

Underlined text indicates concentration exceeds the estimated background concentration.

ND Indicates that the contaminant is not detected within the XRF limits of detection.

A Determining background soil concentrations of trace elements across New Zealand [13].

B The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health [1].

C Australian National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure Schedule B(1): Guideline on the investigation levels for soil and groundwater[15]. Health Investigation Level: HIL D (commercial / industrial).

D Criteria for Cr_6 presented as criteria for Cr_3 are non limiting.

5 Discussion

The XRF used in this assessment was used by trained staff and was calibrated before and after scanning the samples. The results are able to be interpreted in a meaningful way, even though laboratory verification of accuracy has not been undertaken during this screening exercise.

The results are considered representative of the contaminant conditions at the various sample locations, but the actual concentrations could be a few mg/kg higher or lower than the XRF estimates.

Given the fact that the SCSs for industrial / commercial land use are significantly higher than the concentrations estimated by the XRF survey, it is considered highly unlikely that the actual soil contamination concentrations exceed the industrial / commercial SCSs.

The XRF estimates are not considered likely to be inaccurate enough to result in actual significant contamination impacts not being detected at the sample locations. However, due to the background concentrations of most of the metals assessed in this investigation being relatively low, it is considered possible that areas with minor contamination impacts (above background, but below industrial / commercial SCSs) may not be detected.

6 Conceptual Site Model

A contamination conceptual site model, presented in Table 6, consists of three primary components to allow the potential for risk to be determined. These are:

- Source of contamination;
- Pathway to allow the contamination to mobilise; and
- Sensitive receptors which may be impacted by the contamination.

Table 6: Conceptual Site Model

Source	Pathway	Receptor
Naturally occurring heavy metals	Inhalation of dust Dermal absorption (direct contact) Ingestion of soil and / or produce grown in the soil	Maintenance / Excavation workers Site workers Current and future residents
Acceptable risk to human health?	Earthworks Associated with Land Development and Future Industrial / Commercial use Yes: Visual assessment of the site, as well as XRF screening of soil samples from locations of interest suggest that contamination impacts at the site do not pose a significant risk to human health when developing the site and when undertaking industrial / commercial activities.	

7 Conclusions

Information obtained as part of this investigation (refer to Section 3) indicates that the site has been used for commercial poultry farming (1960s and 1970s), storage of inert construction materials (gravel in the early 1980s) and production of firewood (2010s-2024).

Evidence was found that three HAIL[11] activities have occurred within the site boundary, therefore IE undertook preliminary contamination screening by collecting samples from ten areas of interest (refer to Figure 2) and submitting them to E3 Scientific for XRF scanning. The results confirmed that minor contamination impacts have occurred because concentrations of one or more heavy metals (arsenic, chromium, lead, nickel and / or zinc) marginally exceed the naturally occurring concentrations in all samples. As a result, soil from the site cannot qualify for use as cleanfill.

None of the heavy metals assessed in this investigation were found at concentrations near to the industrial / commercial SCSs. The XRF data is considered to be appropriate to demonstrate that the site is highly unlikely to contain contamination impacts that pose a significant risk to human health when undertaking industrial / commercial activities, as well as when excavating soil at the site.

Based on the current contamination status of the site, given the potential sources identified, it is considered highly unlikely that there will be a risk to human health if the Zone was changed to industrial / commercial.

Furthermore, given the following factors, the risk to ecological receptors is considered negligible:

- Marginal contamination impacts (slightly above natural concentrations);
- The significant depth of groundwater at the site (approximately 30 m bgl); and
- The lack of a significant surface watercourse within 200 m of the site.

8 Recommendations

It is recommended that the application to rezone the site for industrial / commercial use be approved because no contamination impacts exceeding the industrial / commercial SCSs have been discovered in the ten areas of interest identified during the site history and site walkover assessments.

Advice from ORC confirms that their Consent required for soil disturbance at a site where the contaminant concentrations exceed the naturally occurring levels and also pose an immediate or long-term hazard to the environment. As the risks to the environment were considered to be negligible at this site, soil disturbance at the site does not meet the criteria to require Consent under Rule 5.6.1 of the Regional Plan Waste[16]

9 References

1. Ministry for the Environment 2012: Users' Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health
2. Ministry for the Environment 2021: Contaminated Land Management Guidelines No.1: Reporting on Contaminated Sites in New Zealand
3. GNS Webmap Institute of Geological and Nuclear Sciences 2013: 1:250,000 Geology. Viewed at: http://data.gns.cri.nz/geology/
4. Otago Regional Council 2012: Alexandra Groundwater Basin Allocation Study.
5. Otago Regional Council 2024: Otago Regional Council Resource Consent Database. Viewed at: http://data.orc.govt.nz/
6. The Cyclopedia of New Zealand 2024: Mr James Hazlett. Viewed at: https://nzetc.victoria.ac.nz/tm/scholarly/tei-Cyc04Cycl-t1-body1-d2-d17-d19.html
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9. Google Earth v7.3.6.9796. Clyde, Central Otago, New Zealand. -45.192551° lon, 169.335855° lat, Eye alt 477 m. Airbus 2024. http://www.earth.google.com. [March 2024]
10. Mapspast 2024: Current and Historical Topographic Maps (Topomaps) of New Zealand. Viewed at: http://www.mapspast.org.nz/
11. Ministry for the Environment 2011: Ministry for the Environment Hazardous Activities and Industries List
12. Ministry for the Environment 2011: Contaminated Land Management Guidelines No.2 - Hierarchy and Application in New Zealand of Environmental Guideline Values.
13. Landcare Research New Zealand Limited and Hawke's Bay Regional Council 2023: Determining background soil concentrations of trace elements across New Zealand.
14. Ministry for the Environment 2002: A Guide to the Management of Cleanfills.
15. Australian National Environmental Protection Council 2013: National Environmental Protection (Assessment of Site Contamination) Measure Schedule B(1): Guideline on the investigation levels for soil and groundwater.

10 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, Hartley Road Partnership, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the IPENZ/ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on 021 556 549 if you require any further information. The author is a Certified Environmental Practitioners (CEnvP) under the Environment Institute of Australia and New Zealand (EIANZ) accreditation system.

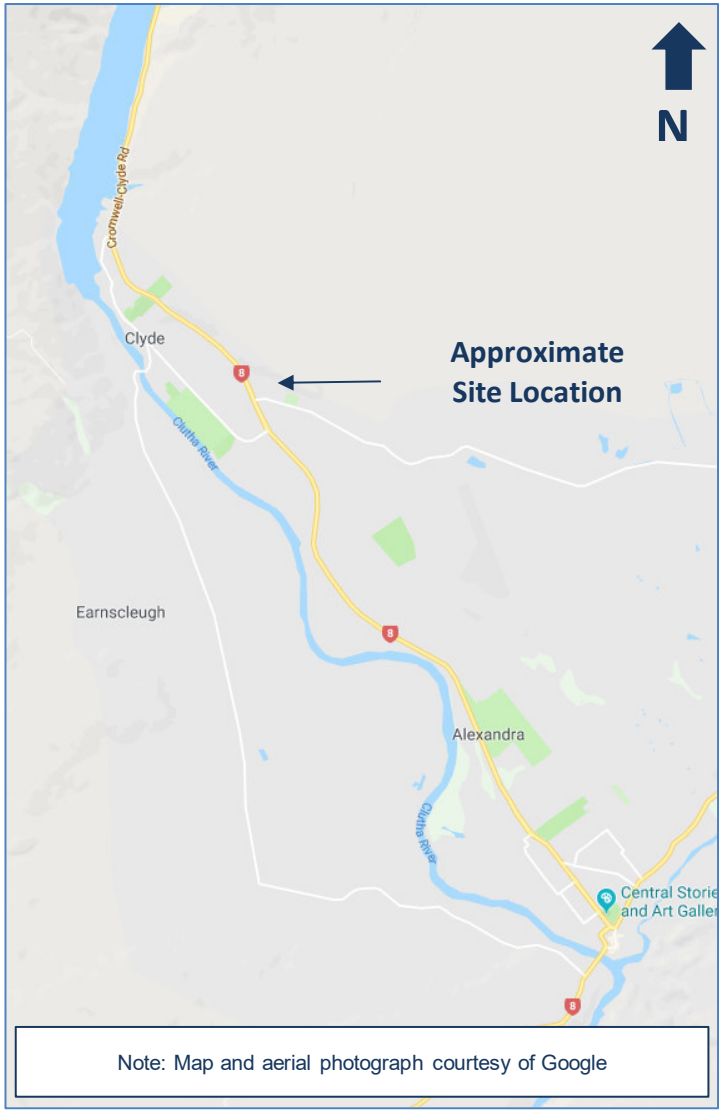
Report prepared by

Claude Midgley, CEnvP

Associate Environmental Scientist

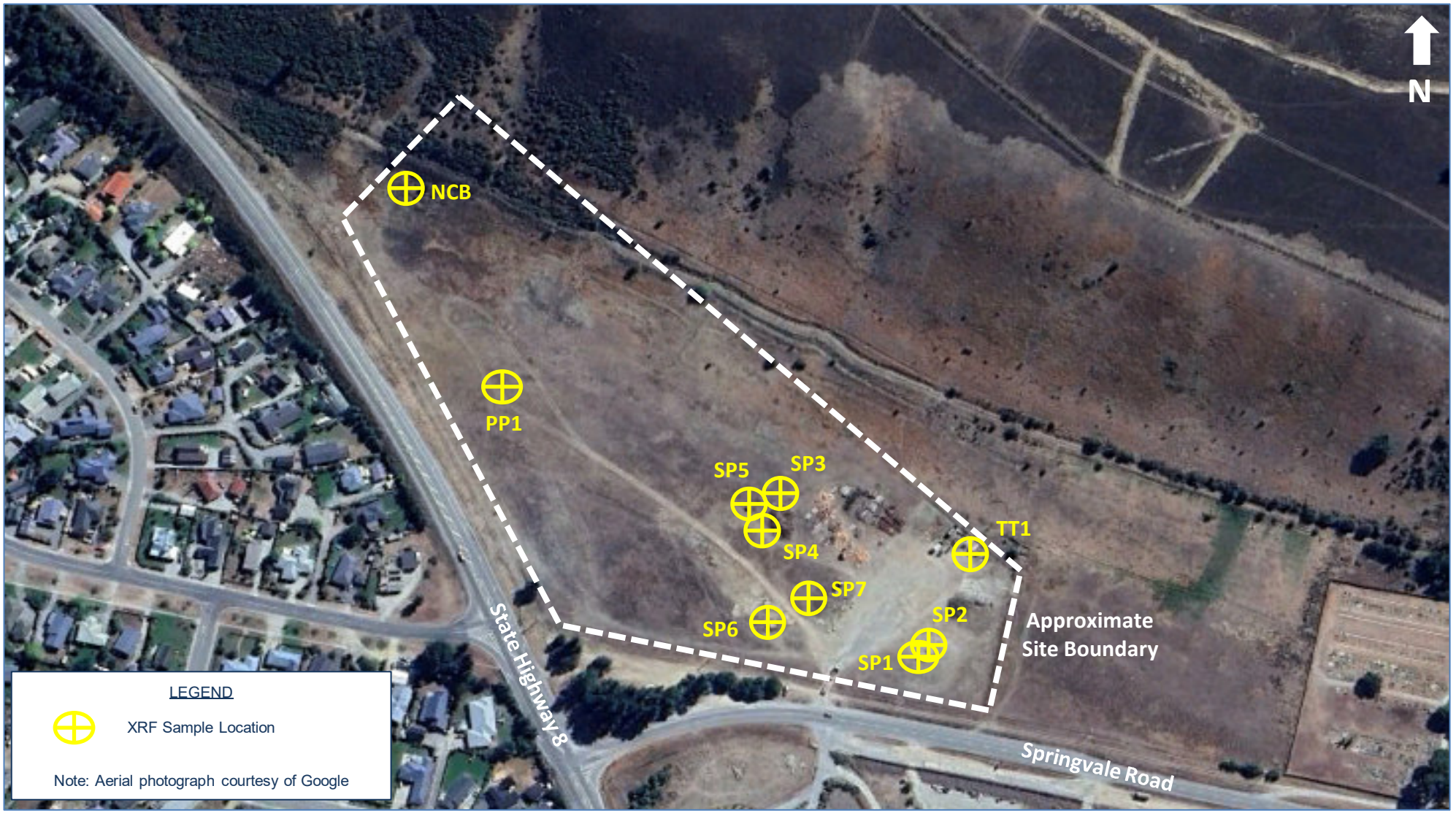
APPENDIX 1

Figures



Note: Map and aerial photograph courtesy of Google

Description	Site Location Plan	**Figure Number**	1
Project	Preliminary Environmental Site Investigation at the Corner of Springvale Road and State Highway 8, Clyde	**Date**	Mar-24
Client	Hartley Road Partnership	**Drawn by**	CM
Project Number	24002	**Approved by**	JK



Description	Sample Location Plan	**Figure Number**	2
Project	Preliminary Environmental Site Investigation at the Corner of Springvale Road and State Highway 8, Clyde	**Date**	Mar-24
Client	Hartley Road Partnership	**Drawn by**	CM
Project Number	24002	**Approved by**	JK

APPENDIX 2

Proposed Private Plan Change Area

Pt Sec 2 Blk LIII
TN OF Clyde

Unformed Legal Road

CROMWELL

State Highway 8

Hazlett St

OIT DP 23081

ALEXANDRA

Defunct Water Race

Powerline

Powerline

Springvale Road

168m to C/L SH8

Pt Town Belt
Town of Clyde

Cemetery
Reserve
Town of Clyde

Landscaped
Buffer Strip

MH
Valves
PBox
Transformer

1
1.28 Ha

2
1830 m²

3
2465 m²

4
2290 m²

5
2455 m²

6
3045 m²

7
2340 m²

8
3020 m²

9
2055 m²

10
1455 m²

11
1150 m²

12
1560 m²

13
2700 m²

14
2060 m²

15
2225 m²

16
2085 m²

17
2180 m²

18
2130 m²

19
2280 m²

20
2915 m²

21
5190 m²

0m 30m 60m 90m

1:1500

N

Coordinates are in terms of
Lindis Peak 2000.

Elevation in Terms of:
NZVD 2016 Level Datum

Origin of Levels
IT DP 23081 (EWEG)
RL= 166.30m

Contour Intervals = 0.50m

Note!

No direct access to SH8 or
Springvale Road for any lot.

PATERSONPITTSGROUP
Surveying • Planning • Engineering
Your Land Professionals
www.ppgroup.co.nz
0800 PPGROUP

ALEXANDRA
8 Skird Street
Alexandra 9320

T +64 (3) 448 8775
E alexandra@ppgroup.co.nz

Client & Location:

Hartley Road Partnership

Purpose & Drawing Title:

CONCEPT PLAN

FOR INFORMATION

Surveyed by:	BD	Original Size:	Scale:
Designed by:	.	A3	1:1500
Drawn by:	KWG		
Checked by:	PD		DO NOT SCALE
Approved by:	PD		
Job No:	Drawing No:	Sheet No:	Revision No: / Date:
A5202	PLAN	1	A / 29/01/2024

APPENDIX 3

Site Photographs

Photo 1: Site viewed from the entrance in the south east, facing north

Photo 2: Treated timber stored near to the caravan in the north eastern portion of the site.

Photo 3: Treated timber stored near to the caravan.

Photo 4: Treated timber stored near to the caravan.

Description	Site Photographs	**Photos**	1 to 4
Project	Preliminary Environmental Site Investigation at the Corner of Springvale Road and State Highway 8, Clyde	**Date Taken**	8/2/24
Client	Hartley Road Partnership	**Taken by**	CM
Project Number	24002	**Approved by**	JK

Photo 5: Sample SP1, viewed from the north west facing south east.

Photo 6: Sample SP2, viewed from the south east facing north west.

Photo 7: Caravan and firewood production area, viewed from the east facing north west.

Photo 8: Minor surface soil stains near to the caravan.

Photo 9: Firewood production area west of the caravan.

Photo 10: Engine oil containers and minor staining of the surrounding soil.

Description	Site Photographs	**Photos**	5 to 10
Project	Preliminary Environmental Site Investigation at the Corner of Springvale Road and State Highway 8, Clyde	**Date Taken**	8/2/24
Client	Hartley Road Partnership	**Taken by**	CM
Project Number	24002	**Approved by**	JK

Photo 11: Site viewed from the north west facing south east.

Photo 12: Inert construction materials stored in the eastern portion of the site.

Photo 13: Sample location PP1, viewed from the north facing south.

Photo 14: Sample location NCB, viewed from the north facing south.

Description	Site Photographs	**Photos**	11 to 14
Project	Preliminary Environmental Site Investigation at the Corner of Springvale Road and State Highway 8, Clyde	**Date Taken**	8/2/24
Client	Hartley Road Partnership	**Taken by**	CM
Project Number	24002	**Approved by**	JK

APPENDIX 4

Historical Certificates of Title

CANCELLED

2/366

Application No. 493.

(C)

NEW ZEALAND.

CERTIFICATE OF TITLE.

Register Book,

Vol. 2 Folio 366

James Hazlett of the Town of Clyde in the Province of Otago and Colony of New Zealand Merchant is now seized of an Estate in fee simple subject nevertheless to such encumbrances liens and interests as are notified by Memorial under written or indorsed hereon in that piece of land situated in the Town of Clyde aforesaid containing by admeasurement two (2) acres and ten (10) perches more or less as the same is delineated on the plan drawn at the foot hereof and therein all the rights and appurtenances thereto belonging which said piece of land is the town allotment marked Block Thirty one [XXXI] delineated in the Public Map of the said Township deposited in the office of the Commissioner of Crown Lands at Dunedin respectively granted the twenty fifth day of April 1871 under the hand and seal of Sir George Ferguson Bowen K.C.M.G. Governor of New Zealand to John Cox of Clyde aforesaid Settler now

IN WITNESS whereof I have hereunto signed my name and affixed my seal this fourteenth day of March one thousand eight hundred and seventy two

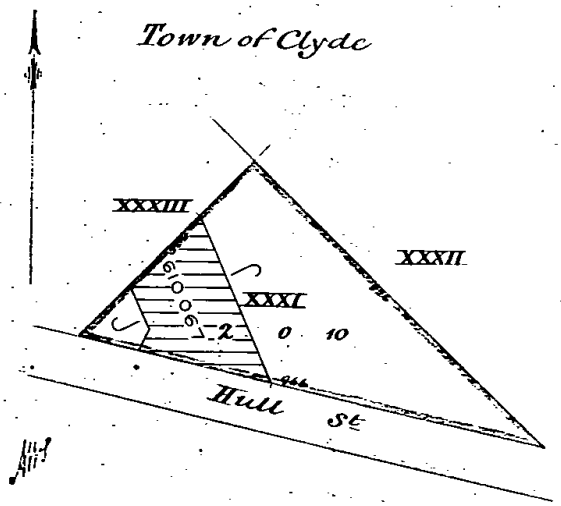
Signed in the presence of }
Wm Hazlett Alb Clarke }
the 20th day of March 1872

Entered

District Land Registrar
of the District of Otago

EQUIVALENT METRIC AREA IS 8347 m²
610 067 2005 m²
6342 m²

Town of Clyde



Scale 2 Chains = 1 inch

Transmission No. 9500 to Bridget Agnes Hazlett, William Thomas Hazlett and Luke Clyde Hazlett entered 9th July 1914 at 12.15 p.m.

Transmission No. 7968 to William Thomas Hazlett and Luke Clyde Hazlett entered 30th September 1915 at 11.10 a.m.

Transmission 36774 to Luke Clyde Hazlett as Survivor Entered 31st August 1954 at 10.12 a.m.

Transfer 190076 Luke Clyde Hazlett to Briar Works Limited produced 31st August 1954 at 10.13 a.m.

Mortgage 156637 Briar Works Limited to Luke Clyde Hazlett DISCHARGED 5 OCT 1961 31st August 1954 at 10.20 a.m.

238040 Transmission of Mortgage 156637 to The Perpetual Trustee Estate and Agency Company of New Zealand Limited as Trustee. Entered 19.9.1961 at 2.21 p.m.

Sec LST Act 4/5/60

272681 Transfer to William Lewis Holdom of Clyde, Carpenter — 8.6.1964 at 2.3pm

273953 Transfer to Clarence Roy Walker of Alexandra Farmer — 10.7.1964 at 9.55 AM

277183 Imposition of DISCHARGED pursuant to section 13 of the Public Works Amendment Act 1948 entered 30.9.1964 at 10.0 a.m.

Over

C.T. 2/346

287842 Transfer to Franciscus Antonius Van Boxtel of Clyde Poultry Farmer and Franciscus Martina Van Boxtel his wife - 1.7.1965 at 11.5 am

287843 Mortgage to [redacted] at 11.10 am - 1.7.1965

DISCHARGED

314632 Mortgage to Bank of New Zealand. 30-5-1967 at 2.34 pm

see 2 pages

A.L.R.

THIS REPRODUCTION (ON A REDUCED SCALE) CERTIFIED TO BE A TRUE COPY OF THE ORIGINAL REGISTER FOR THE PURPOSES OF SECTION 215A LAND TRANSFER ACT 1952.

A.L.R.

483128 Proclamation defining the middle line of a portion of State Highway [redacted] (Timaru-Milton) entered 15.8.1977 at 9.39 am (affects part).

A.L.R.

491480 Compensation Certificate pursuant to Section 317 of the Public Works Amendment Act 1948 - 10.2.1978 at 11.46 am

DISCHARGED

A.L.R.

540558 Transmission to Francisca Martina Van Boxtel as survivor entered 27.8.1980 at 1.53 pm

A.L.R.

610067 Gazette Notice declaring part of the within land (2005m^2) shown hatched black on the diagram hereon is acquired for road and shall vest in the Crown on 9 February 1984 - 20.2.1984 at 2.02 pm

A.L.R.

627969 Gazette Notice hereby declaring that part of State Highway No 8 (Timaru to Milton via Cromwell) adjoining the within Land to be a Limited Access Road - 20.12.1984 at 11.53 am. (pages 3 + 5)

A.L.R.

LSP 21.12.1994

875902/2 Discharge of Mortgage 314632 as to Part Lots 12 and 13 DP 24206 herein - 16.2.1995 at 9.22am

A.L.R.

2/346

875902/3 Transfer of the part Lot 12 DP 24206 herein to Leon Francis Van Boxtel of Clyde Pipelayer, Jane Marie Scott of Kurow Married Woman Christine Elizabeth Ramage of Clyde Married Woman and Lianneke Mechelina Adriana Lodge of Christchurch Married Woman - 16.2.1995 at 9.22am

A.L.R.

Pursuant to Section 238 (1) (a) Resource Management Act 1991 the part Lot 13 DP 24206 herein is vested in the Central Otago District Council as road

A.L.R.

875902/15) New CT 16B/204 issued for the
16.2.1995) part Lot 12 DP 24206 herein

A.L.R.

875902/20) Cancelled and new CT 16B/208
16.2.1995) issued for the balance herein

A.L.R.

DUPLICATE DESTROYED

16/2/1995

DISTRICT LAND REGISTRAR
Cancelled
OTAGO NEW ZEALAND

APPENDIX 5

CODC NES Records Search

NES RECORD SEARCH

Application

JKCM Limited PO Box 456, Cromwell 9342	Number NES240004 Application date 9/02/24 Phone Mobile 021556549 Email claude@insighteng.co.nz

Property

Valuation No.	2846140100
Location	Springvale Road, Springvale
Legal Description	Section 1 Block XXXIV Town of Clyde, Part Block XXXIV Town of Clyde, Part Block XXXIII Town of Clyde, Block XXXII Town of Clyde and Part Block XXXI Town of Clyde
Area (hectares)	6.5901

Resource consents

Resource Area: Rural Resource Area

Consents:

No information in relation to the above could be found on this record.

Building

Consents/Permits/Compliance Schedules:

28/09/1972	Building Permit 3225: Erect a new shed
	No information in relation to HAIL activities could be found on this record.
23/07/1962	Building Permit 1538: Erect a new hen-house
	No information in relation to HAIL activities could be found on this record.
23/07/1962	Building Permit 1540: Erect a new egg room
	No information in relation to HAIL activities could be found on this record.
02/11/1961	Building Permit 1461: Additions to existing poultry house
	No information in relation to HAIL activities could be found on this record.
08/01/1961	Building Permit 1477: Erect a new hen house
	No information in relation to HAIL activities could be found on this record.
22/04/1960	Building Permit 1188: Erect a new egg room, packing and store room
	No information in relation to HAIL activities could be found on this record.
05/05/1958	Building Permit 851: Erect a new poultry house
	No information in relation to HAIL activities could be found on this record.

Preliminary Site Investigations and Detailed Site Investigations

No information in relation to the above could be found on this record.

Aerial Photographs

Council's aerial photographs for the site date back to 2003. Aerial photographs indicate the presence of areas of stored timber. The bulk outdoor storage of treated timber is Item A18 on the HAIL and may trigger NES-CS requirements if undertaken on the site.

Figure One: Outdoor timber storage (Source: CODC Aerial Photographs dated 2023)

Other Land Features

No information in relation to the above could be found on this record.

Disclaimer: The Council does not hold records directly relating to activities on the Hazardous Activities and Industries List (HAIL). In the event some information is available it cannot be guaranteed as correct or complete and therefore may not satisfy your request. We therefore recommend you undertake further investigation to determine whether any HAIL activities exist on the site.

Prepared by

Adam Vincent
Planning Officer - Consents
Date: 14 February 2024