

Project Number: 25086

Date: 30/09/2025

Revision: A

## PRELIMINARY SITE INVESTIGATION

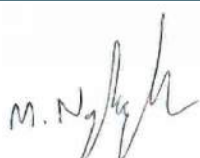
122 MORVEN FERRY ROAD

Prepared for **Gibbons Development Limited**

## Executive Summary

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site Address</b>                     | 122 Morven Ferry Road, Queenstown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Area</b>                             | ≈ 212 ha                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Current Land Use</b>                 | Rural residential, low-intensity pastoral farming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Proposed Land Use</b>                | Mixed-use development comprising approximately 1,250 homes, a workers' accommodation complex, a village centre with retail, hospitality, office and community services, and integrated recreational amenity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Development Activities</b>           | Subdivision, soil disturbance, change in land use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Records and Information Reviewed</b> | <p>Regional Council Records (Otago Regional Council)</p> <ul style="list-style-type: none"> <li>• HAIL database search</li> <li>• Well search</li> </ul> <p>District Council Records (Queenstown Lakes District Council)</p> <ul style="list-style-type: none"> <li>• Property files</li> </ul> <p>Land Information New Zealand orchard layer</p> <p>Historic Aerial Photographs (1956 – 2022)</p> <p>Site Walkover</p> <p>Landowner Interview</p>                                                                                                                                                                                                                                                    |
| <b>Historic Land Use</b>                | <p>The site has predominantly supported pastoral farming and rural residential use. Within this setting, several activities listed on the Hazardous Activities and Industries List (HAIL) have been identified, including:</p> <ul style="list-style-type: none"> <li>• Fuel storage (ASTs, USTs, and barrels) (HAIL A17)</li> <li>• Sheep spray race and stock handling facilities (HAIL A8)</li> <li>• Clay target shooting area (HAIL C2)</li> <li>• Offal pit (HAIL G5)</li> <li>• Historic fly-tipping in a gully (HAIL G3)</li> <li>• Painted structures with deteriorated cladding (potential HAIL I)</li> </ul> <p>These activities are confined to discrete areas within the wider site.</p> |
| <b>NES-CS Application</b>               | Based on the information reviewed, several HAIL activities are likely to have occurred on site. Accordingly, the NES-CS applies to the proposed subdivision and further investigation in the form of a Detailed Site Investigation (DSI) is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Recommendations</b>                  | <p>It is recommended that a DSI be undertaken across the identified HAIL areas prior to development earthworks.</p> <p>This PSI should be submitted to Queenstown Lakes District Council in support of the consent application, with the subsequent DSI providing the basis for any remedial or management measures required.</p>                                                                                                                                                                                                                                                                                                                                                                     |

Document Control

|                |                                                       |                                                                                                                                                                            |  |
|----------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Title          | Preliminary Site Investigation                        |                                                                                                                                                                            |  |
| Project number | 25086                                                 |                                                                                                                                                                            |  |
| Client         | Gibbons Development Limited                           |                                                                                                                                                                            |  |
| Distribution   | Cameron Hodgson                                       |                                                                                                                                                                            |  |
| Date           | 30 September 2025                                     |                                                                                                                                                                            |  |
| Revision       | A                                                     |                                                                                                                                                                            |  |
| Status         | Final                                                 |                                                                                                                                                                            |  |
| <hr/>          |                                                       |                                                                                                                                                                            |  |
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| Approved by    | James Jackson<br>MESci, CEnvP                         |   |  |
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Certifying Statement

The individual(s) undertaking and/or certifying this investigation meet the definition of a Suitably Qualified and Experienced Practitioner (SQEP) under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES-CS), holding the following credentials:

- 1. A tertiary qualification in environmental science or engineering.
- 2. A minimum of 10 years of relevant experience.
- 3. Registration with a recognised professional body that assesses and certifies environmental professionals based on competency, training, experience, professional conduct, and ethical standards.

This investigation has been conducted in accordance with applicable New Zealand regulations and guidance documents, with this report prepared in line with the Ministry for the Environment’s *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand* (2021).

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## 1 Introduction

Springline Limited (Springline) has been engaged by Gibbons Development Limited (the client) to prepare this Preliminary Site Investigation (PSI) for 122 Morven Ferry Road, Arrow Junction, Queenstown (the site).

The site covers approximately 212 hectares (ha) across 15 separate land parcels and contains a mix of rural uses. For the purposes of this report, two distinct areas have been defined based on land use characteristics:

- **Area 1** – the farmhouse and associated outbuildings.
- **Area 2** – land adjoining the southern riverbank.

These areas are referenced throughout this report, while the balance of the property is referred to collectively as '*the wider site*'. A site location plan is provided below for reference.



Site location plan, showing the site boundary (yellow) and Area 1 and Area 2 (white boxes) and general surrounds

### 1.1 Objective

This report has been prepared in general accordance with the National Environmental Standards for Assessing and Managing Contaminants in Soil<sup>1</sup> (NES-CS) and the Contaminated Land Management Guidelines (CLMG)<sup>2</sup>.

The purpose of this PSI is to report on the site history to assess the suitability of its current or intended land use, the objective of which is to determine any actual or potential sources of contamination, as required under the Resource Management Act 1991 (RMA).

<sup>1</sup> Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations, 2012

<sup>2</sup> Ministry for the Environment (MfE) Contaminated Land Management Guidelines No.1: Reporting on Contaminated Sites in New Zealand. Updated 2021.

## 1.2 Proposed Development

The proposed development is a mixed-use residential and commercial precinct comprising approximately 1,250 homes, a workers' accommodation complex, and a village centre incorporating retail, hospitality, community services, and office space.

The project also includes landscape and ecological restoration, with close to 60 hectares of new native planting proposed on Morven Hill and along the Kawarau River escarpment. Recreational amenities will be integrated throughout the site, including a connected network of walking and cycling trails.

A copy of the proposed masterplan is included in Appendix A.

## 1.3 Scope

The scope of work includes:

- A review of readily available information pertaining to the site's history and environmental setting, including:
  - District Council Records (Queenstown Lakes District Council)
  - Regional Council Records (Otago Regional Council)
  - Land Information New Zealand (LINZ) records
  - Review of selected historical aerial photographs
  - Previous contaminated land reports for the site (if any)
- A site walkover
- Interview with the landowner
- Risk assessment and preliminary conceptual site model

# 2 Site Setting

## 2.1 Site Information

The site is positioned between Morven Ferry Road and the Kawarau River and is currently used for low-intensity pastoral farming and rural residential use with associated farm infrastructure and outbuildings.

The site layout and location are included in Figures 1 – 3, Appendix B, with general information on the site setting provided below in Table 1.

**Table 1: Site Information**

| Item              | Detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Address           | 122 Morven Ferry Road, Queenstown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Legal Description | <p>As reported in the AEE, the legal description of the site comprises:</p> <p>Lot 2 DP 601937 (24.7 ha) (RT: 1174254)</p> <p>Lot 3 DP 529201 (2.05 ha) (RT: 857180)</p> <p>Lot 5 DP 300661 (9.5 ha), Section 21 Block IX Shotover SD, and Sections 23, 24, 71, 64, Blocks VIII Shotover SD (82.7 ha) (RT: 946021)</p> <p>Section 22 Block IX Shotover SD (23.1 ha) (RT: OT406/118)</p> <p>Section 23 Block IX Shotover SD (26.5 ha) (RT: OT7D/1456)</p> <p>Section 1-2 SO 478164, Section 25 Block IX Shotover SD, and Lots 3-4 DP 300661 (45.1 ha) (RT: 946040)</p> <p>Section 1 SO 420327 (8.6 ha) (RT: 492534)</p> |

|                     |       |                                                                                 |
|---------------------|-------|---------------------------------------------------------------------------------|
| Area                |       | 212 ha                                                                          |
| District Council    |       | Queenstown Lakes District Council (QLDC)                                        |
| Regional Council    |       | Otago Regional Council (ORC)                                                    |
| Zoning <sup>3</sup> |       | Rural General                                                                   |
| Site Land Use       |       | Rural and rural residential (pastoral farming with dwelling and farm buildings) |
| Neighbouring sites  | North | Morven Ferry Road, beyond which is rural residential                            |
|                     | East  | Rural residential                                                               |
|                     | South | Kawarau River                                                                   |
|                     | West  | Morven Hill / rural                                                             |

## 2.2 Environmental Setting

Information on the site's environmental setting is provided in Table 2.

**Table 2: Environmental Setting**

| Item                   | Detail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Geology <sup>4</sup>   | <p>The site is located within the Whakatipu Basin. To the west, it is bounded by Morven Hill, which is underlain by Rakaia Terrane schist; the basement rock of the Otago region and a known precursor for mineralisation of trace elements such as arsenic and iron<sup>5</sup>. This schist is exposed at the surface and forms a ridge that transects the centre of the site.</p> <p>At the northern and southern extents of the site, the surficial geology is mapped as Late Pleistocene outwash deposits, described as '<i>generally unweathered, well sorted, loose, sandy to bouldery gravel forming large terraces and outwash plains</i>' mapped as surficial deposits at the north and south ends of the site.</p> |
| Soil Type <sup>6</sup> | <p>The site is mapped as being underlain by pallic soils described as shallow, well drained loam and silt (<i>Arrowf_3, Arrowf_4 and Ngapara_19a.1</i>) typical of the Wakatipu Basin. They are derived from the regional schist basement rock with a loess mantle expected.</p> <p>This was corroborated by the Soil and Resource Report<sup>7</sup> which identified schist loess over schist collusion, rock or glacial till.</p>                                                                                                                                                                                                                                                                                          |
| Topography             | <p>The site lies on the eastern toe slopes of Morven Hill and has a varied landform. Much of the farmed area is undulating, with hummocky ridges and pockets of flatter terrace land. To the west, the land rises into moderately steep hill country, while to the south a prominent alluvial terrace drops steeply to the Kawarau River escarpment.</p> <p>The overall fall is eastward toward Morven Ferry Road, with localised ridges through the central portion of the site.</p>                                                                                                                                                                                                                                         |

<sup>3</sup> QLDC. Operative District Plan GIS Maps (<https://districtplan.qldc.govt.nz>) Accessed 10/09/2026.

<sup>4</sup> GNS Science. 1:250k Geological Map <https://data.gns.cri.nz/geology/>. Accessed 10/09/2026.

<sup>5</sup> Craw & Druzicka (2023) Geological controls on locally elevated arsenic in the Glenorchy area, Otago, New Zealand <https://doi.org/10.1080/00288306.2023.2174147>

<sup>6</sup> Landcare Research. S-Map Online. <https://smap.landcareresearch.co.nz/maps-and-tools/app>. Accessed 10/09/2026.

<sup>7</sup> Hanmore Land Management (2025). Soil and Resource Report for 122 Morven Ferry Road, Arrowtown.

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydrogeology <sup>8,9</sup> | <p>The site is located within the regional Wakatipu Basin Aquifer, where groundwater typically occurs within Quaternary alluvial and outwash deposits.</p> <p>At the northern end of the site, the Morven Aquifer (an outlying aquifer of variable thickness) is situated in the glacial outwash and Arrow River alluvium. Groundwater in this aquifer is expected to flow southeast towards the Arrow River. There is an existing well on the site (ORC Well ID: F41/0264) drilled to a depth of 18.3 m.</p> <p>In addition, shallow perched water may be encountered locally across the site as a result of the water race.</p>                    |
| Hydrology <sup>10</sup>     | <p>The Kawarau River defines the southern boundary of the site, flowing westward towards Lake Wakatipu. The Arrow River is located ~350 m northeast of the site; it flows to the southeast where it terminates into the Kawarau River. Along the northern boundary, a tributary of the river has been modified to provide land drainage.</p> <p>A water race traverses the site from northwest to southeast, discharging into the Kawarau River further east. This water race forms part of the Arrow River Irrigation Scheme, which conveys water from the Arrow River towards Morven Ferry Road and intercepts surplus flows along its course.</p> |

### 2.2.1 Local Groundwater Use

ORC's online mapping tool<sup>11</sup> was viewed to access the location of existing groundwater wells in the general area of site. One well is listed within the site boundary, and three bores are listed within a 200 m radius of the site, summarised below in Table 3.

**Table 3: Groundwater Well Search**

| Onsite           |             |                                                                                          |
|------------------|-------------|------------------------------------------------------------------------------------------|
| <b>F41/0264</b>  | Use         | Domestic                                                                                 |
|                  | Location    | On site (northern portion of site)                                                       |
|                  | Well depth  | 18.31 m bgl                                                                              |
|                  | Water level | 1.11 (one measurement)                                                                   |
|                  | Drill date  | 2000                                                                                     |
|                  | Screen      | Unknown                                                                                  |
|                  | Aquifer     | Morven                                                                                   |
|                  | Well status | Existing                                                                                 |
|                  | Bore Log    | 0.3 m of topsoil overlying very silty gravels to 13.6 m depth with schist bedrock below. |
| Surrounding Area |             |                                                                                          |
| <b>F41/0073</b>  | Use         | Community Drinking Water Supply                                                          |
|                  | Location    | ~34 m west (up-gradient, 100 Morven Ferry Road)                                          |
|                  | Well depth  | 8 m bgl                                                                                  |

<sup>8</sup> Otago Regional Council (ORC), March 2021. State of the Environment: Groundwater Quality in Otago.

<sup>9</sup> Otago Regional Council. July 2014. Investigation into the Wakatipu Basin Aquifers.

<sup>10</sup> Otago Regional Council District Plan GIS Maps (<https://maps.orc.govt.nz/>) Accessed 10/09/2026.

<sup>11</sup> Otago Regional Council Wells Otago GIS Maps (<https://maps.orc.govt.nz/OtagoViewer232/?map=9869c74871aa4db390b6ffe2a49ac2c5>). Accessed 23/09/2025

|                 |              |                                                                                    |
|-----------------|--------------|------------------------------------------------------------------------------------|
|                 | Water level  | Unknown                                                                            |
|                 | Drill date   | Unknown                                                                            |
|                 | Screen       | Unknown                                                                            |
|                 | Aquifer Type | Morven                                                                             |
|                 | Well status  | Existing                                                                           |
|                 | Bore Log     | Unknown                                                                            |
| <b>F41/0450</b> | Use          | Domestic                                                                           |
|                 | Location     | 64 m north (cross-gradient, 101 Morven Ferry Road)                                 |
|                 | Well depth   | 9.32 m bgl                                                                         |
|                 | Water level  | 4.12 (one measurement)                                                             |
|                 | Drill date   | 2016                                                                               |
|                 | Screen       | 6.32 – 7.32 m                                                                      |
|                 | Aquifer Type | Morven                                                                             |
|                 | Well status  | Existing                                                                           |
|                 | Bore Log     | 0.5 m of topsoil overlying silty gravels to 7.5 m depth with schist bedrock below. |
| <b>F41/0150</b> | Use          | Domestic                                                                           |
|                 | Location     | 20 m north (cross-gradient)                                                        |
|                 | Well depth   | Unknown                                                                            |
|                 | Water level  | 10.97 (one measurement)                                                            |
|                 | Drill date   | Unknown                                                                            |
|                 | Screen       | Unknown                                                                            |
|                 | Aquifer Type | Morven                                                                             |
|                 | Well status  | Existing                                                                           |
|                 | Bore Log     | Unknown                                                                            |

### 3 Site History

#### 3.1 Regional Council Records

##### 3.1.1 HAIL Database

The ORC Listed Land Use Register (LLUR) was reviewed as part of this investigation. The LLUR is not a complete record, however, it contains information on land parcels in Otago that have been associated with activities on the Hazardous Activities and Industries List<sup>12</sup> (HAIL).

The site is not listed on the LLUR. A review of surrounding properties was also undertaken, and no properties within a 200 m radius of the site are listed as having HAIL.

<sup>12</sup> Ministry for the Environment, 2011. Hazardous Activities and Industries List.

74 Morven Ferry Road (adjacent to northwestern site boundary) and Hamilton Farm (adjacent to eastern site boundary) are listed on the LLUR as 'Verified Non-HAIL' sites.

### 3.2 District Council Records

Property files for the site were supplied by the Client and included the following:

- 1980 and 1983: Development plan for the northern part of the site (Area 1) associated with a new dwelling (1980) and a new garage (1983). The documentation includes a description of the land, land use, residential development plans, and the site drainage (noted that irrigation water collects at the rear of the property and a pond has formed)
- 2015, 2018 and 2019: Water quality tests referenced for 74 Morven Ferry Road (2015 and 2018)
- 2017: Building Consent (BC171347) and Code Compliance Certificate associated with plumbing works undertaken on site to handle wastewater from a kitchen catering truck
- 2017 - 2019: Subdivision consents and accompanying documentation for subdividing various parcels within the site boundary
- 2017: Resource consent application and decision documentation to vary conditions within a pre-existing subdivision consent at 74 and 122 Morven Ferry Road to include an internal boundary adjustment and construction of a water tank (RM170861)
- 2018: Correspondance related to culvert conformance works at 74 Morven Ferry Road detailing works undertaken to ensure culvert along road was covered to a correct depth
- 2019: Electricity supply confirmation at 122 Morven Ferry Road
- Certificates of title for the seven titles that make up the site, land transfer documents, historic consents for former subdivision of the site, and LINZ instrument documentation related to easements and land covenants
- Various leases of the land associated with the joint-party use of the telecommunications tower situated atop on Morven Hill
- 2000: Bore permit application and associated land use consent and bore summary form for the construction of the domestic bore on the property
- Map of titles for the site
- 2022 (2023 updated): Resource consent application to temporarily retain a building and to permanently retain an earth bund and farm track with accompanying Assessment of Environmental Effects (AEE), correspondence, and other consent documentation (RM221044 and RM230994) – this consent sought to retain a firewood dry storage canopy structure and an earth bund (along northeastern site boundary) beyond their consented period (2017 to 2022)
- 2023: Hamilton Farm Overview: A3 map of the site with various site features highlighted. Of interest was:
  - Area 1:
    - A sheep dip (HAIL A8) and fuel underground storage tank (UST (HAIL A17) on the farm area north of the site
  - Area 2:
    - A historic refuse site located in the central southern portion of the site on the river terrace (HAIL G3),
    - A clay bird shooting area (HAIL C2) and an offal pit (HAIL G5) in the southeast portion of the site near the riverbank
- 2024: Resource consent to undertake a boundary adjustment (along northeastern site boundary by farm area) and relocate an earth bund



- June 2024: Proposed district plan zoning definitions for the Rural Zone and Wakatipu Basin Rural Amenity Zone associated with the Proposed District Plan (September 2025) – the proposed plan would see the rezoning of the northern most and eastern portions of the site from Rural to Wakatipu Basin Rural Amenity Zone
- 2024: Email correspondence from QLDC which includes a list of historic building consents and permits for the site:
  - 1963: Building permit for additions to woolshed farm building
  - 1976: Building permit for alteration and additional bedroom to dwelling
  - 1978: Building permit for a hay barn and covered yards
  - 1979: Building permit for a cascade and swimming pool
  - 1986: Building permit for alterations and additions to dwelling
  - 1986: Plumbing and drainage permit for dwelling alterations
  - 1987: Building permit for a 15 x10 m implement shed
  - 1990: Building permit for a conservatory and growing area
  - 2018: Building consent for a steel frame canopy for firewood storage

### 3.3 LINZ Orchard Layer

The site is not listed on the Land Information New Zealand Orchard layer<sup>13</sup>.

### 3.4 Historical Aerial Photographs

A review of selected available historical aerial photographs was completed for this PSI. The photographs were dated between 1956 and 2022 and sourced from Retrolens Historical Image Resource<sup>14</sup> and Google Earth<sup>15</sup>.

Copies of the photographs are available in Appendix C and observations are summarised below in Table 4.

**Table 4: Summary of Historical Aerial Photographs**

| Date                                    | Site                                                                                                                                                                                                                                                                                                                                                                        | Surrounding Area                                                                                                       |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>1956</b><br><br>(Excluding 'Area 1') | Based on the earliest available historical image, the site appears to comprise undeveloped, rural land comprising the eastern extent of Morven Hill, ridge lines, and scoured river terraces.<br><br>The water race is already present on site.                                                                                                                             | The surrounding area also appears as undeveloped rural land.                                                           |
| <b>1958</b><br><br>(Full site)          | The rural farm buildings in the northeast of the site (Area 1) are already in place in this earliest aerial image of this area. There appears to be one residence and at least four surrounding farm buildings/implement sheds. Gravel tracks are visible servicing the farm block to the south.<br><br>All remaining site areas comprise undeveloped pasture / rural land. | No significant changes observed. There is minor rural residential land use at the eastern extent of Morven Ferry Road. |

<sup>13</sup> Toitū Te Whenua. Land Information New Zealand (LINZ). NZ Orchard Polygons 1:50k (<https://data.linz.govt.nz>)

<sup>14</sup> RetroLens. Historical Image Resource (<https://retrolens.co.nz/>)

<sup>15</sup> Google Earth 2023. (<https://earth.google.com/>)

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                          |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>1959</b><br><i>(Full site)</i> | The site appears similar to the previous aerial. One of the farm buildings on site appears to have been potentially extended, or replaced, showing a longer footprint.                                                                                                                                                                                                                                                                                                                               | No significant changes observed. A large pond is visible east of the site.                                               |
| <b>1964</b><br><i>(Area 1)</i>    | Some development of the rural residential farm area in the northeast of the site has occurred. There are stock pens, six farm buildings/implement sheds, and a residential dwelling. Scouring / ponding is apparent at the surface in this area.                                                                                                                                                                                                                                                     | Some trees have been planted in the lot north of the site / Morven Ferry Road.                                           |
| <b>1966</b><br><i>(Full site)</i> | Two small farm sheds have been constructed in the wider site / rural land, one near the southern site boundary and one near the eastern site boundary.                                                                                                                                                                                                                                                                                                                                               | No significant changes observed.                                                                                         |
| <b>1976</b><br><i>(Full site)</i> | Low quality aerial photograph. A farm track leading from the northeast to the wider site appears to be in place.                                                                                                                                                                                                                                                                                                                                                                                     | A couple small farm sheds are visible on surrounding properties.                                                         |
| <b>1978</b><br><i>(Full site)</i> | Area 1: There appears to be potential planting or balage occurring in the paddock west of the dwelling. A new farm building is visible, along with a potential sheep dip / spray race immediately north of the building.<br><br>Area 2: There appears to be some disturbance at the surface near the large gully along the river terrace/escarpment slope, with potential fly tipping visible.<br><br>Wider Site: More access tracks are visible, but no significant changes are otherwise observed. | The surrounding area appears similar to previous aerals with some minor rural residential development that has occurred. |
| <b>1983</b><br><i>(Full site)</i> | No significant changes observed. Some trees have been planted along the water race.                                                                                                                                                                                                                                                                                                                                                                                                                  | No significant changes observed.                                                                                         |
| <b>1984</b><br><i>(Area 1)</i>    | One of the farm buildings appears to have been demolished and reconstructed. Scouring and ponding is evident in the adjacent paddock.                                                                                                                                                                                                                                                                                                                                                                | No significant changes observed.                                                                                         |
| <b>2001</b><br><i>(Full site)</i> | Access tracks are now well defined across the farm site, including a prominent track leading up the eastern flank of Morven Hill. Adjacent to the track are two small areas of disturbance, potentially associated with quarrying activities.<br><br>Some shelter belts / trees are visible in the centre of the site and in the northeast of the site.                                                                                                                                              | Minor rural residential development has occurred to the north and northwest of the site.                                 |
| <b>2004</b><br><i>(Full site)</i> | The potential quarrying sites along the track leading up Morven Hill are more prominent, and an additional potential quarrying site is visible in the central site area.                                                                                                                                                                                                                                                                                                                             | No significant changes observed.                                                                                         |
| <b>2006</b><br><i>(Full site)</i> | No significant changes observed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                          |



|                                   |                                                                                                                                          |  |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>2010</b><br><i>(Full site)</i> | Area 1: An additional farm building has been constructed.<br>Area 2: No significant or noticeable change                                 |  |
| <b>2011</b><br><i>(Full site)</i> | An additional quarry site has appeared in the centre of the farm site.                                                                   |  |
| <b>2016</b><br><i>(Full site)</i> | No significant changes observed.                                                                                                         |  |
| <b>2022</b><br><i>(Full site)</i> | Site appears similar to present day conditions.<br>The firewood storage shed has been constructed in the northeast of the site (Area 1). |  |

## 4 Site Visit

### 4.1 Site Walkover

A site walkover was undertaken on 9<sup>th</sup> September 2025. Photographs documenting site conditions are provided in Appendix D. All key features described below are marked on Figures 2 – 3 in Appendix B.

#### 4.1.1 Area 1 - farmhouse and farm infrastructure

Area 1 occupies the northeastern corner of the property, adjoining Morven Ferry Road, and includes the existing residence, farm outbuildings, and associated paddocks. Key observations are summarised below:

- A two-storey timber and stone dwelling with corrugated iron roofing is located to the west of the farm sheds and holding pens. The structure was generally in good condition. No potential asbestos-containing materials (PACM) were identified, although painted cladding was present across parts of the exterior (Photograph 1).
- North of the dwelling was a dilapidated pool house containing an indoor/inground swimming pool. Construction comprised stone, timber, and corrugated fibre-plastic sheeting. No PACM or painted surfaces were noted (Photograph 2 & 3).
- Southeast of the dwelling stood the main farm shed, a modern timber and steel structure on a concrete slab, used for storing tractors, vehicles, and agricultural equipment. No PACM or fuel storage was identified (Photograph 4).
- East of the dwelling were livestock holding sheds of mixed timber and stone construction. Painted timber cladding was observed in parts, and the structures were in generally poor condition with flaking paint noted. No PACM was observed (Photographs 5 – 8).
  - A disused sheep spray race was located north of the livestock sheds. The spray chamber was of steel construction, in poor condition, and located on a concrete base. The surrounding stock race surfaces leading to/from the spray chamber were of mixed concrete and bare soil (Photographs 9 – 11).
  - Surrounding the livestock holding sheds were a series of outdoor timber pens and fencing, with additional pens located between the sheds and the sheep spray chamber to the north, and further fencing extending south of the sheds (Photographs 12 – 13).
- An underground storage tank (UST) was identified by fill points and vents south of the livestock sheds, within a grassed area near the holding pens (Photograph 14).

- An aboveground storage tank (AST) was observed southeast of the residence. The tank was not banded, and surface staining was noted beneath it, confined to a small area (Photograph 15).
- Several empty fuel barrels were stored nearby in the same paddock as the AST. The area was also used for general farm equipment and material storage. No staining was observed, though bare soil and reduced grass cover were evident around the barrels (Photograph 16).
- East of the dwelling was a dilapidated corrugated iron and timber-framed implement shed, used to store tractors, equipment, hay bales, and firewood. No PACM or fuel storage was observed (Photograph 17).
- The former firewood yard, located nearby, was now a flat grassed paddock with no evidence of fill or residual materials (Photograph 18).
- West of the residence was another corrugated iron and timber-framed farm shed, which was locked at the time of inspection. No external evidence of fuel storage or PACM was observed (Photograph 19).

The remainder of Area 1 consisted of flat grassed paddocks historically used for grazing, though no livestock were present at the time of inspection.

#### 4.1.2 **Area 2** – southern river terrace and escarpment

Area 2 covers the southern portion of the property, including the river terrace and escarpment above the Kowarau River. For safety reasons, inspection was limited to the farmed terrace land; the lower escarpment was not accessed. Observations are summarised below:

- The prominent gully noted in the aerial photography (Refer to Figure 3, Appendix B) was inspected, and fly-tipped waste was visible within the gully, including plastics, timber, fabric, and other household materials. Waste was confined within the steep gully slopes and was not present on the terrace above. Closer inspection of the waste material was not possible due to steep terrain (Photographs 20 – 21)
- A small timber-framed, open-fronted shed was identified as a clay pigeon shooting range situated in the southeastern area of the Area 2, immediately adjacent to the river terrace. The firing line directed towards a southwest-facing slope. Clay target fragments and pellets were observed scattered across the slope surface, extending up to at least 30 – 40 m from the firing range structure (Photographs 22 – 25).
- An offal pit was identified within the adjacent fenced paddock on the terrace but could not be inspected due to access restrictions.
- Three small timber-framed and iron-clad sheds were present in the southern paddocks. One, immediately adjacent to the terrace edge, was used for storing a tractor, while others were used to store baggage. No PACM was observed in any structure (Photographs 26 – 27).
- An open schist quarry was observed along the Morven Hill track. No evidence of backfilling or imported material was present. Two smaller open quarry faces were also identified within the rolling paddocks within the farmland, similarly, showing exposed schist with no infill (Photographs 28 – 29).

#### 4.1.3 Wider site

The wider property consists of rolling paddocks with hummocky ridgelines and undulating hill country. Vegetation is dominated by pasture grasses with patches of tussock. The land is fenced for grazing, although no livestock were present during the inspection. Gravel access tracks provide internal access, and a single steel-and-timber hay shed was observed within this area.

A small open stream traverses through the site, flowing within a shallow gully. Clear water was observed at the time of inspection.

#### 4.2 Landowner Interview

An interview was conducted with the landowner during the site walkover on 9 September 2025. The interview is summarised as follows:

- The property has historically been used for livestock farming, primarily deer and venison production.
- The paddock south of the farm sheds and dwelling was formerly leased to Highlander Firewood, who processed and stored firewood on the site. The activity was temporary, and the landowner was not aware of any timber treatment having been undertaken.
- The landowner was not aware of any asbestos present in building materials across the property.
- The sheep spray race has not been used for at least 20 years, and the adjacent stock yards and races have similarly not been used for a number of years.
- Fuel storage on the property has been limited to the underground and aboveground tanks, which were historically used for filling farming vehicles, trucks, and tractors.
- The landowner confirmed the location of the offal pit, which had historically been used for offal disposal and general farm waste.
- No cropping or horticultural activities have been undertaken on the property.
- The landowner also confirmed historic fly-tipping within the prominent gully leading to the Kaware River. This material largely comprised general household waste and rubbish, with no knowledge of hazardous substances or fuels having been disposed of.

## 5 Site Contamination Summary

Potential sources of contamination identified through the desktop review, site walkover, and landowner interview are summarised in Table 5. The risk ratings relate specifically to HAIL-activities and the likelihood of associated soil contamination exceeding applicable human health assessment criteria; they are not intended to represent the scale, extent, or cost of management, but solely the potential for human health exceedances to occur. All HAIL features requiring further investigation are illustrated in Figures 2 and 3 in Appendix B.

Table 5: Summary of Site Contamination

| Site Area                                           | HAIL / Activity                                                   | Comment                                                                                                                                                                                                                                                                                                                                                     | Contaminants                                                                                                                                                                | Risk     | Recommendation                                                                                                                                               |
|-----------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Area 1 –<br>Farmhouse<br>and farm<br>infrastructure | Sheep Spray race<br>(HAIL A8) and<br>adjacent stock<br>races      | A disused sheep spray race is located north of the livestock sheds. Although unused for over 20 years and founded on a concrete base, the structure remains in poor condition, and there is potential for residual contamination in surrounding soils. This risk extends into the adjacent pens and stock races where drip and wash-down may have occurred. | Metal, metalloids and organochlorines                                                                                                                                       | High     | Targeted soil investigation around the spray race, extending into pens/races to delineate any drip/run-off                                                   |
|                                                     | Aboveground<br>storage tank (AST)<br>(HAIL A17)                   | An AST is located southeast of the residence, with surface staining visible beneath it. While the staining appears localised, direct contact with soil suggests potential for contamination.                                                                                                                                                                | Total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene, xylene (BTEX), volatile organic compounds (VOCs), heavy metals | High     | Targeted shallow soil testing beneath/surrounding the AST                                                                                                    |
|                                                     | Underground<br>storage tank<br>(UST) (HAIL A17)                   | An in-situ UST is located south of the livestock sheds. The condition of the tank is unknown, and the potential for historical leakage cannot be discounted.                                                                                                                                                                                                | TPH, PAHs, BTEX, heavy metals                                                                                                                                               | Moderate | Remove under SQEP supervision to NES-CS requirements; decommission all associated infrastructure. Undertake verification sampling and remediate if required. |
|                                                     | Fuel storage<br>barrels and<br>general storage<br>area (HAIL A17) | Several empty fuel barrels were stored near the AST. No staining was visible, although bare soil and reduced grass cover were noted in the immediate area. The historical use of the area for fuel storage indicates potential for minor impacts.                                                                                                           | TPH, PAHs, BTEX, VOCs, heavy metals                                                                                                                                         | Moderate | Judgemental soil testing beneath and around the storage area                                                                                                 |

|                                                       |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                           |          |                                                                                                                                                              |
|-------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                       | Livestock holding shed and timber clad structures (potential <b>HAIL I</b> ) | The livestock sheds east of the dwelling include sections of deteriorated painted timber with flaking observed. While the likelihood of significant contamination is low, there remains a potential for a shallow “lead-halo” around the structures, compounded by proximity to the former sheep spray race and pens.                                                                                                               | Lead, arsenic (from spray race residues), organochlorine pesticides       | Moderate | Targeted and systematic soil testing                                                                                                                         |
|                                                       | Former firewood storage yard (non-HAIL)                                      | The paddock south of the farm sheds was temporarily leased to Highlander Firewood for processing and storage. The area is now grassed, with no evidence of fill or timber treatment. Minor impacts from machinery use cannot be excluded.                                                                                                                                                                                           | TPH, PAHs, heavy metals                                                   | Low      | Limited confirmatory sampling to substantiate low-risk status                                                                                                |
|                                                       | Other farm sheds (non-HAIL)                                                  | Several additional farm sheds of timber and corrugated iron construction were present. These were used for general storage, and no hazardous materials were identified.                                                                                                                                                                                                                                                             | None                                                                      | Very Low | No further investigation required.                                                                                                                           |
| <b>Area 2 – Southern river terrace and escarpment</b> | Clay target shooting area ( <b>HAIL C2</b> )                                 | A small firing range was identified on the southern terrace, consisting of an open shed oriented toward a southwest-facing slope. Clay target fragments and lead shot were observed scattered across the slope for 30–40 m. Such ranges typically result in accumulations of lead pellets in surface soils. Contamination is most likely within the shot-fall zone, where pellets degrade over time and may leach metals into soil. | Lead, antimony                                                            | Moderate | Targeted and systematic surface-soil grid across the shot-fall zone for total Pb (with confirmatory leachability if required)                                |
|                                                       | Offal pit ( <b>HAIL G5</b> )                                                 | The offal pit was confirmed by the landowner but could not be inspected due to fencing. It is understood to have been used for disposal of offal and farm waste, which may have locally affected soils.                                                                                                                                                                                                                             | Nutrients (nitrogen, phosphorus), pathogens, metals, hydrocarbons (minor) | Moderate | Locate and remediate under SQEP supervision. Undertake sampling and manage as controlled excavation with validation and appropriate disposal if encountered. |

|                   |                                                          |                                                                                                                                                                                      |                                                           |                    |                                                                                                   |
|-------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------|
|                   | Historic fly-tipping in steep gully (HAIL G5)            | A steep gully contains fly-tipped household waste including timber, plastics, and other refuse. The material appears inert, but detailed inspection was not possible due to terrain. | Metals, hydrocarbons, asbestos (potential in mixed waste) | Low                | Owing to the steep topography, further investigation and inspection of the gully is not possible. |
|                   | Quarrying sites (non-HAIL)                               | Several small quarry faces and a larger schist quarry were identified. These consist only of exposed rock, with no evidence of backfilling or imported material.                     | N/A                                                       | Very Low           | No further action required.                                                                       |
| <b>Wider site</b> | Pastoral paddocks, access tracks, small sheds (non-HAIL) | The wider site consists of pastoral paddocks, gravel tracks, and minor sheds. No activities or indicators of contamination were identified.                                          | N/A                                                       | No HAIL Identified | No further action required.                                                                       |

## 6 Conclusions

Springline has undertaken a PSI for 122 Morven Ferry Road, Arrow Junction, Queenstown, in support of the proposed large-scale mixed-use development. The PSI was prepared in general accordance with the NES-CS and CLMG guidance and has drawn upon a desktop review, council and land information records, historical aerial imagery, a site walkover, and brief consultation with the landowner.

The site comprises approximately 212 hectares of rural land positioned between Morven Ferry Road and the Kawarau River. Land use has historically been dominated by pastoral farming, supported by a farmhouse, sheds, stock handling facilities, and associated infrastructure. While the wider property has remained largely undeveloped, two discrete areas with potential contamination sources were identified:

- **Area 1 – Farmhouse and farm infrastructure:** contains a disused sheep spray race and associated stock races, a UST, an AST with visible soil staining, areas historically used for fuel storage, and livestock sheds with deteriorated painted timber cladding. A former firewood storage yard was also noted. Collectively, these activities present potential contamination risks associated with organochlorine pesticides, arsenic, petroleum hydrocarbons, and lead.
- **Area 2 – Southern river terrace and escarpment:** includes a small clay target shooting range with visible lead shot and clay target fragments, an offal pit, and evidence of historic fly-tipping within a steep gully. Each presents localised potential for soil contamination, particularly from lead, antimony, nutrients, and mixed waste materials.
- **Wider site:** The balance of the property is characterised by pastoral paddocks, ridgelines, and minor quarrying faces. These areas are not associated with activities on the HAIL.

This PSI has confirmed that several activities listed on the MfE HAIL have occurred on site. These findings trigger the NES-CS in relation to the proposed subdivision, land use change, and soil disturbance.

A Detailed Site Investigation (DSI) is therefore required to delineate the extent of contamination in identified areas and to inform appropriate management and remediation, where necessary.

## 7 Recommendations

It is recommended that:

- A Detailed Site Investigation (DSI) be undertaken to further assess the site contamination status in the areas where HAIL activities have been identified in the PSI.
- This report is provided to the Queenstown Lakes District Council, along with the completed DSI in conjunction with the consent application for the proposed development.

## 8 Limitations

Springline Ltd (Springline) has prepared this Preliminary Site Investigation (PSI) report for Gibbons Development Limited in accordance with the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS) and the Contaminated Land Management Guidelines (CLMG No.1).

Springline's opinions, conclusions, and recommendations are based on the information provided by the client and third parties. While reasonable efforts have been made to ensure the accuracy of this data, Springline does not warrant its completeness or correctness. Consequently, the findings may not reflect all actual site conditions, and it is possible that contamination or other hazards may exist beyond the scope of this investigation.

Springline has applied reasonable care in preparing this report, but no investigation can eliminate the possibility of undiscovered hazards. The conclusions are based on current regulatory standards, which may change over time. If new information or regulatory requirements emerge, further assessment may be necessary.

This report is intended solely for the use of Gibbons Development Limited for the purpose outlined in the scope of work. Springline accepts no liability for any reliance by third parties on this report. Reproduction or distribution of this report, in whole or in part, is prohibited without Springline's prior written consent, except as required for the intended purpose.



## Appendix A Development Masterplan





Ridgeburn - Arrowtown Junction

at 122 Morven Ferry Road for Ridgeburn Ltd



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t 04 472 9729 | e architects@novakmiddleton.co.nz

FILE REFERENCE: N:\2025\2512 122 Morven Ferry Road - Gibbons  
\02-BL\PLN\250422-2512-122\_Morven\_Ferry\_Rd-Site-BL-  
AC28\_Site Masterplan\_Lots off.pln

PRINTED: 20/05/2025

Scale @ A1: Not to Scale NOT FOR CONSTRUCTION

PD102 / Site Master Plan

GIBBONS

CO



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# Ridgeburn - Arrowtown Junction

at 122 Morven Ferry Road for Ridgeburn Ltd



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AC28\_Site Masterplan\_Lots off.pln

PRINTED: 23/05/2025

Scale @ A1: Not to Scale NOT FOR CONSTRUCTION

PD101 / Lot Plan

GIBBONS | CO

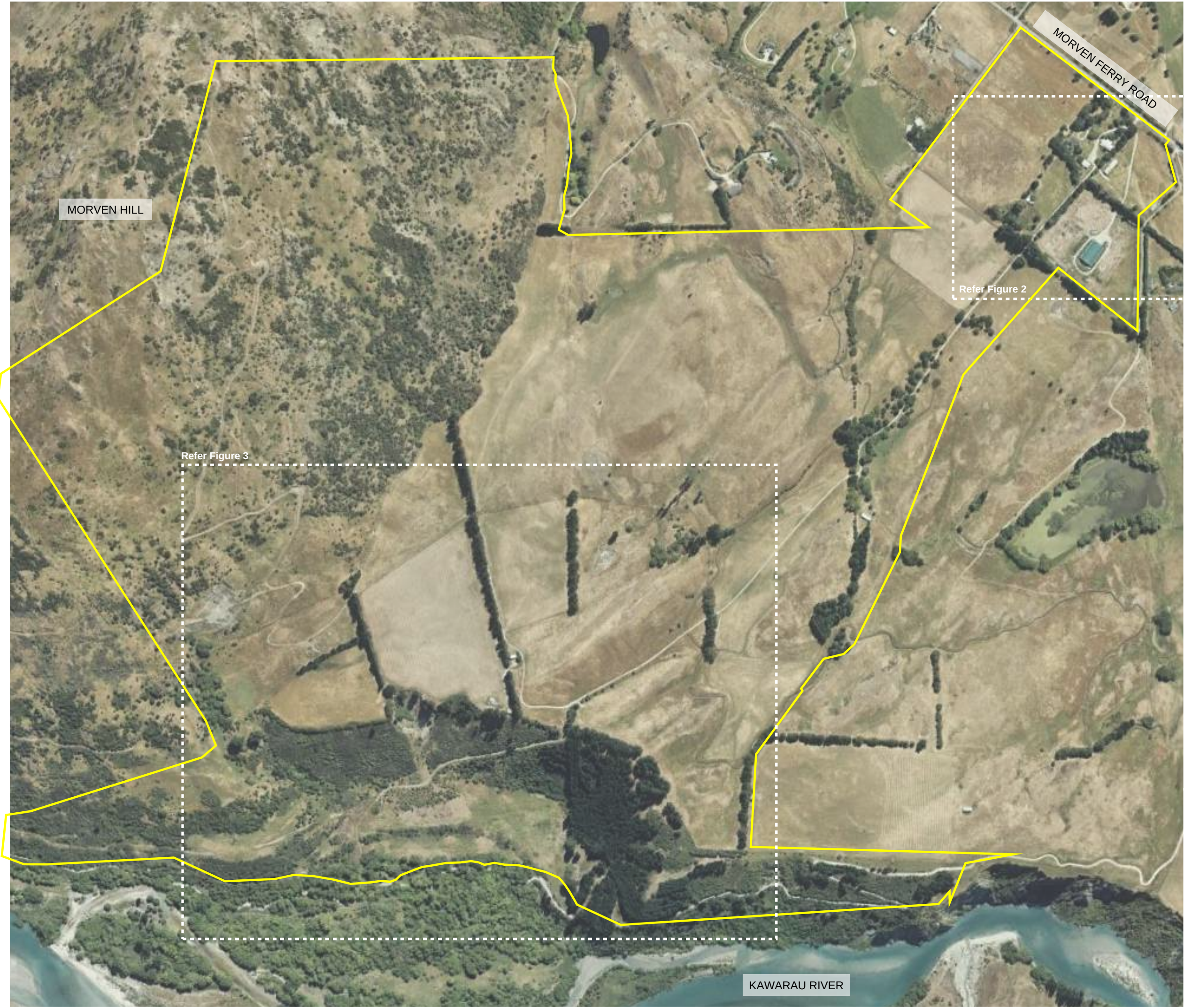
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## Appendix B Site Plans





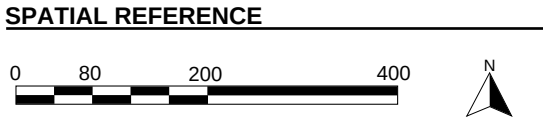
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**TITLE**  
Figure 1: Site Plan

**PROJECT**  
122 Morven Ferry Road

**CLIENT**  
Gibbons Development Limited

**LEGEND**  
 Approximate Site Boundary

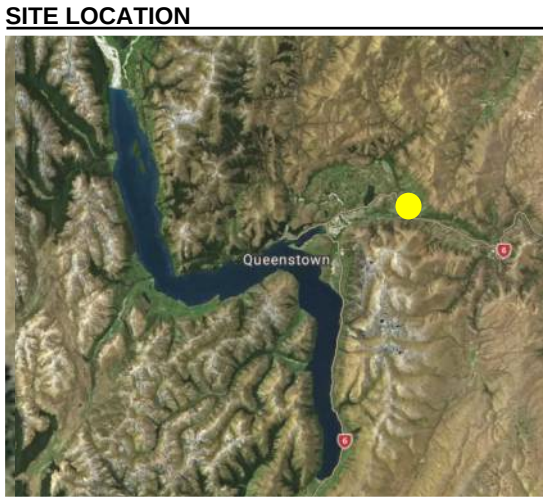


**PROJECT MANAGEMENT**

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| Approved | MN | Date | 29.09.2025 |
| Checked  | JJ | Date | 29.09.2025 |
| Drawn    | NN | Date | 26.09.2025 |

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**TITLE**  
Figure 2: Site Plan (Area 1)

**PROJECT**  
122 Morven Ferry Road

**CLIENT**  
Gibbons Development Limited

**LEGEND**

- Approximate Site Boundary
- HAIL / Further Investigation Areas

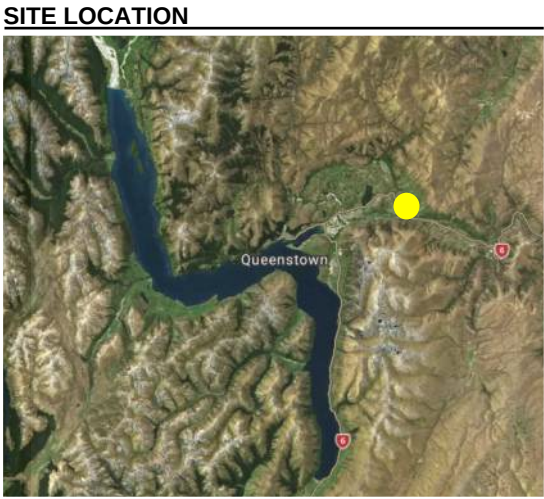
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| Checked            | JJ | Date | 29.09.2025 |
| Drawn              | NN | Date | 26.09.2025 |

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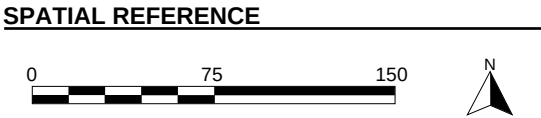


TITLE  
Figure 3: Site Plan (Area 2)

PROJECT  
122 Morven Ferry Road

CLIENT  
Gibbons Development Limited

- LEGEND
- Approximate Site Boundary
  - HAIL / Further Investigation Areas



PROJECT MANAGEMENT

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| Approved | MN | Date | 29.09.2025 |
| Checked  | JJ | Date | 29.09.2025 |
| Drawn    | NN | Date | 26.09.2025 |

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SITE LOCATION





## Appendix C   Historical Aerials





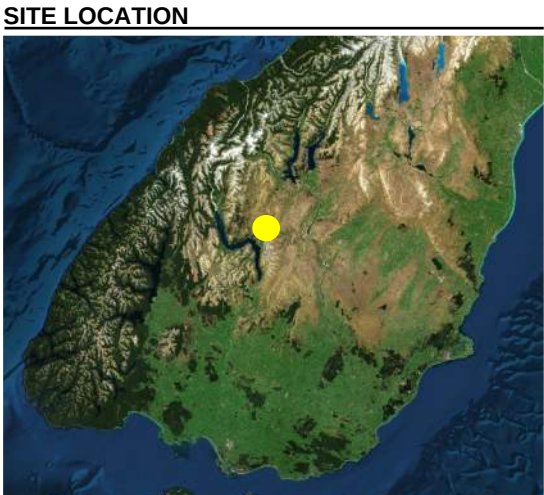
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**PROJECT**  
122 Morven Ferry Road

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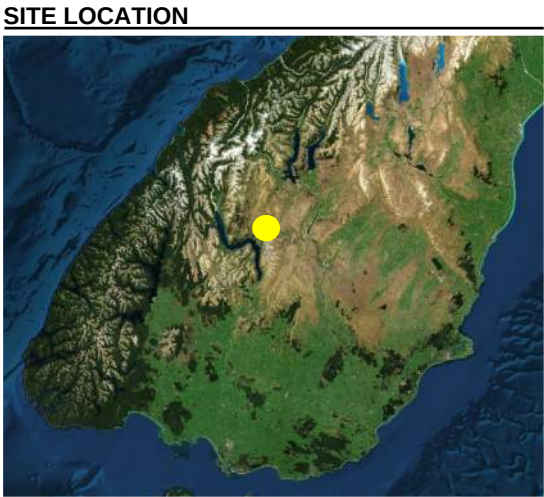
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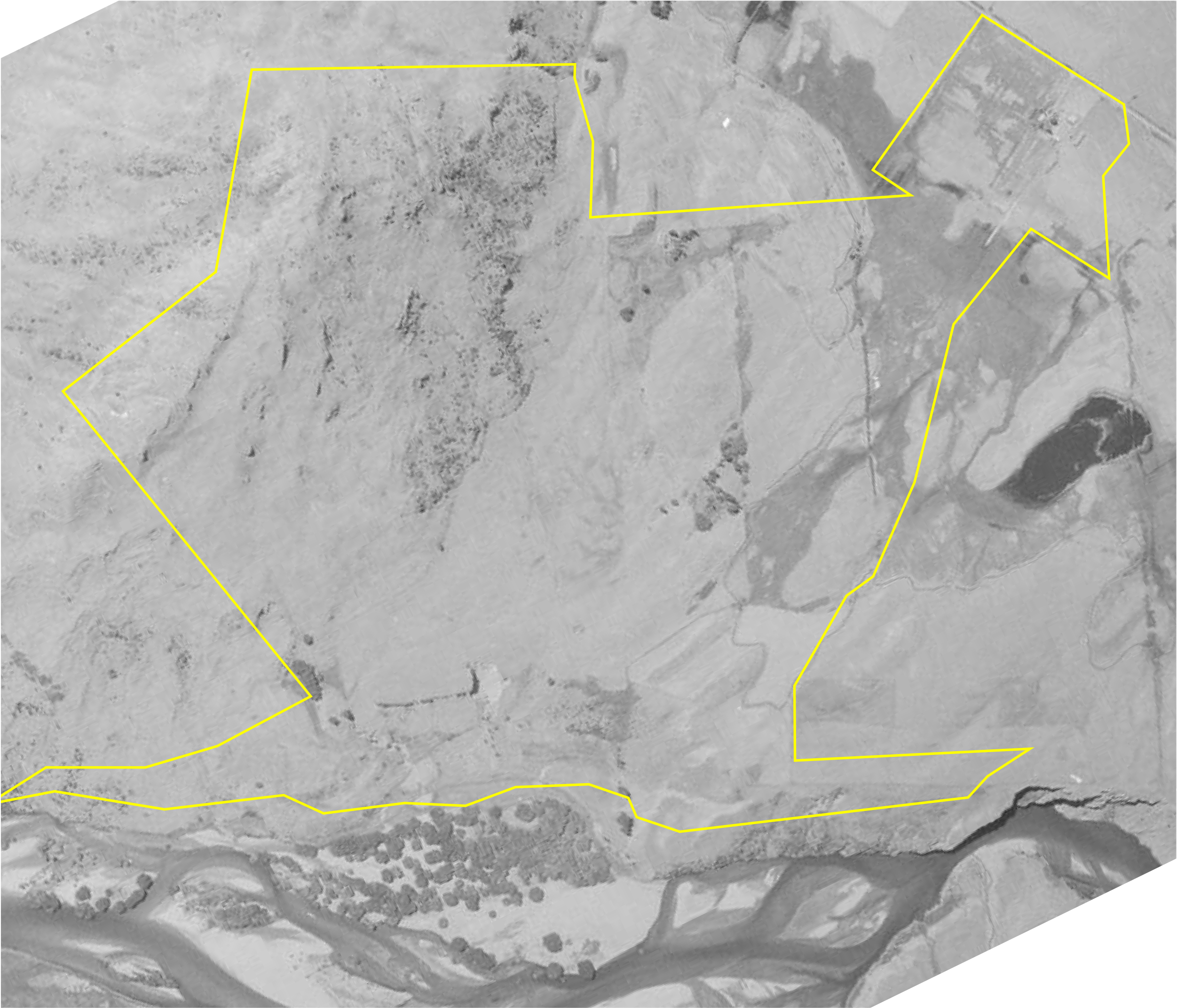
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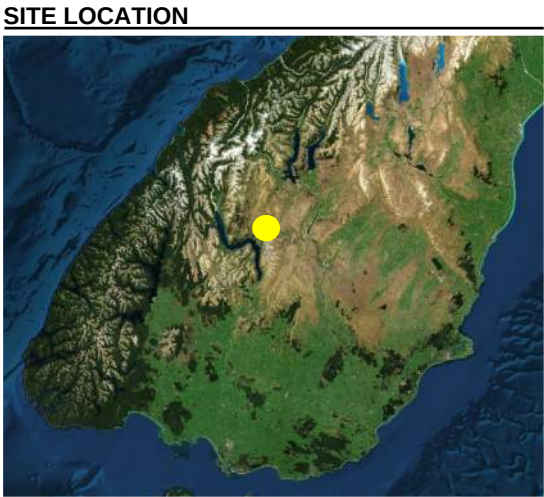
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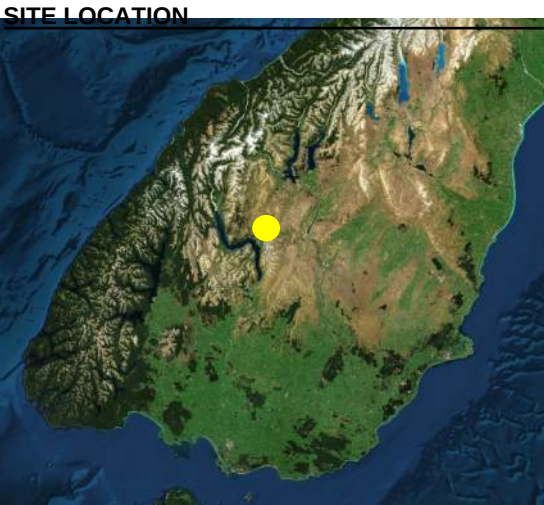
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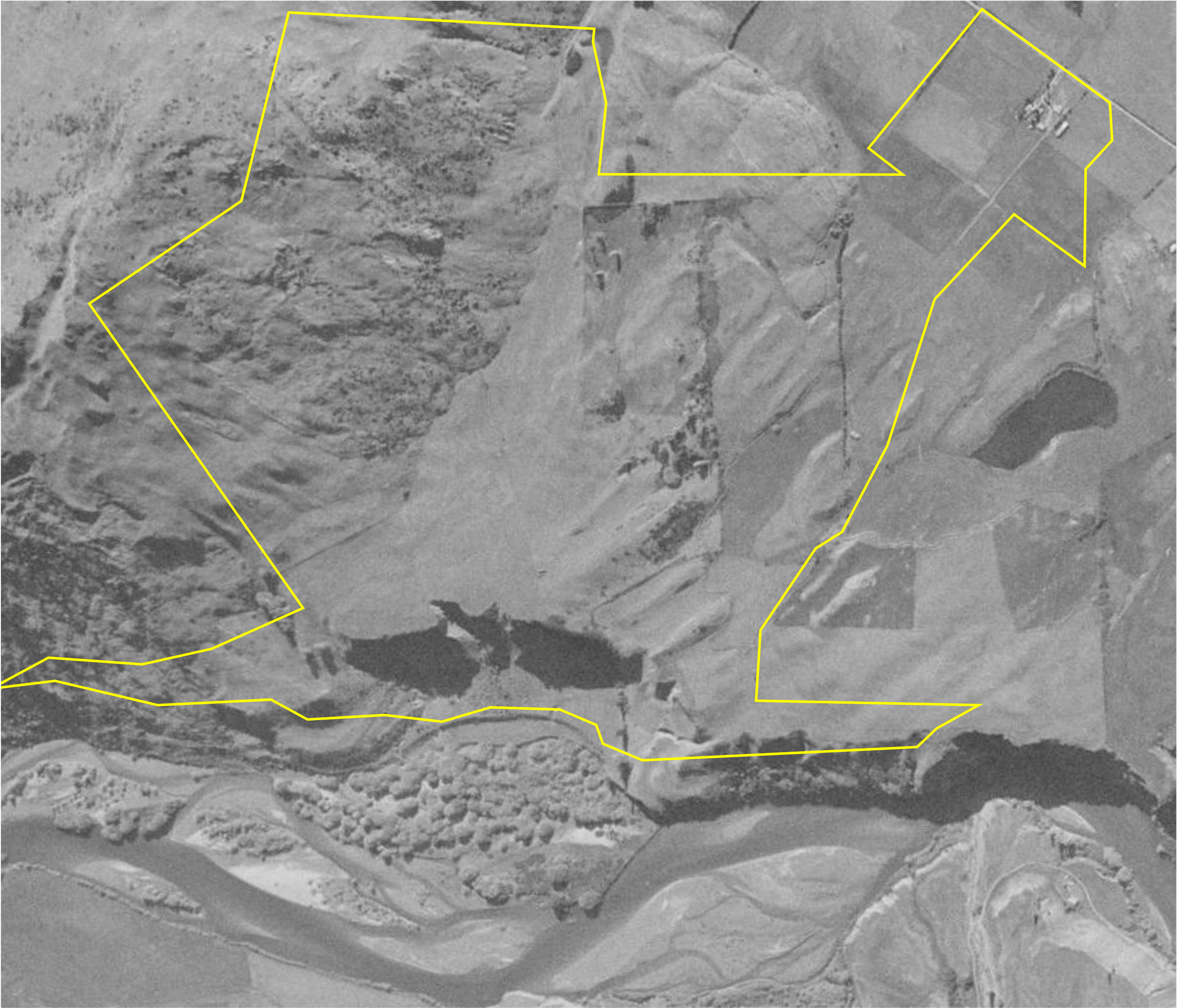
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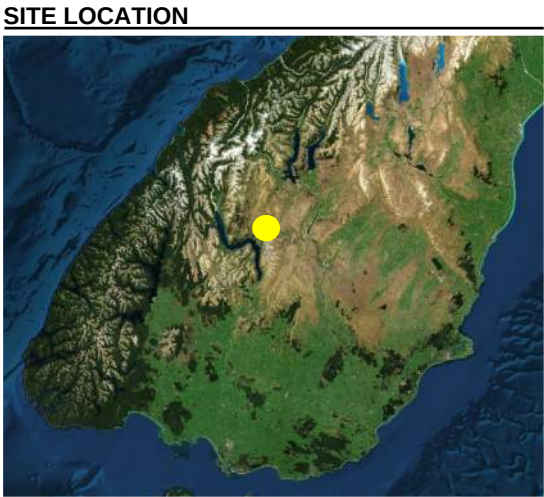
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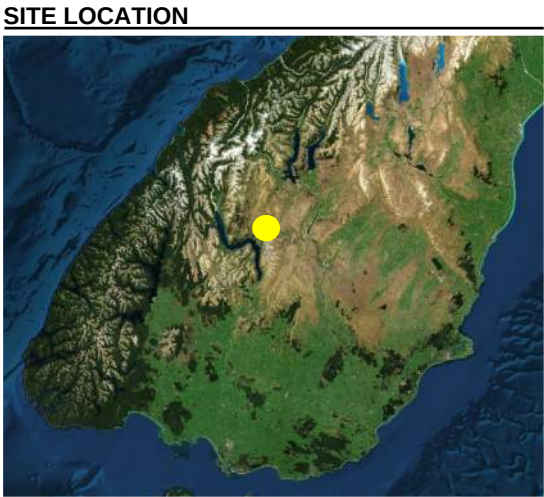
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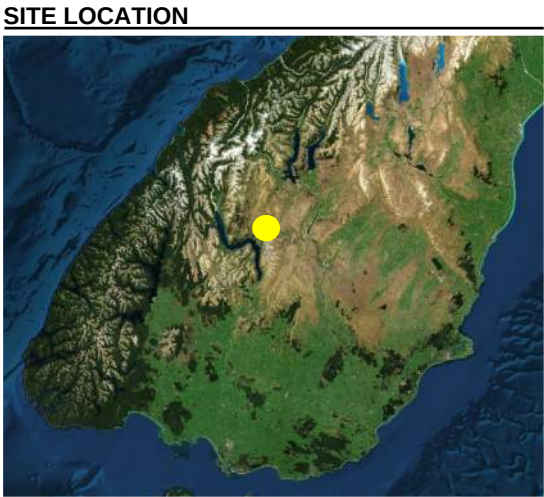
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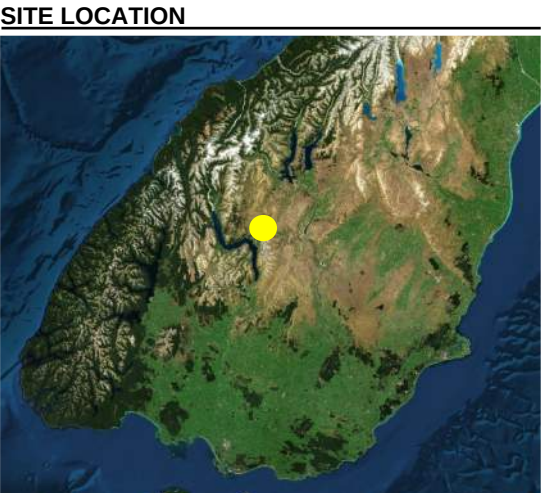


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Historical Aerial 1978 - potential flytip area

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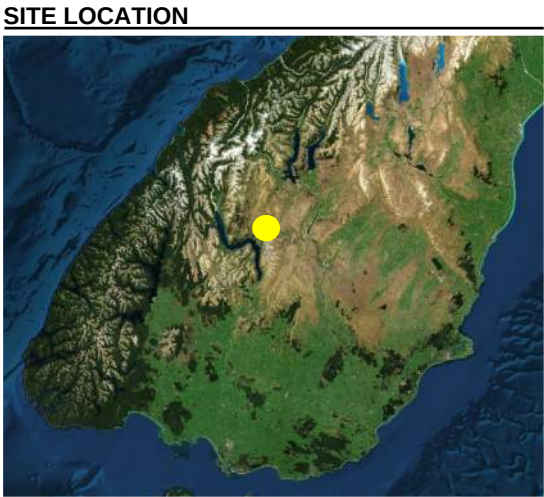
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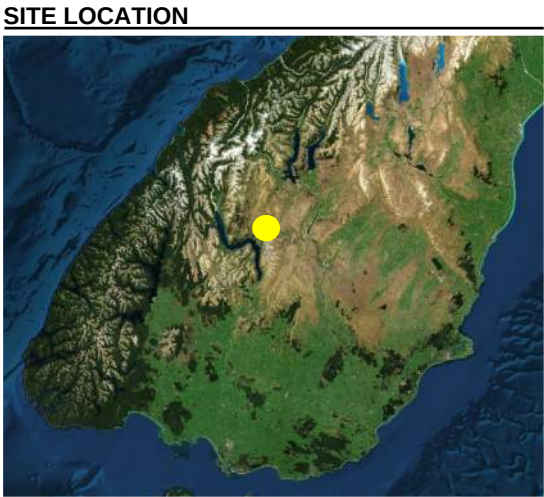
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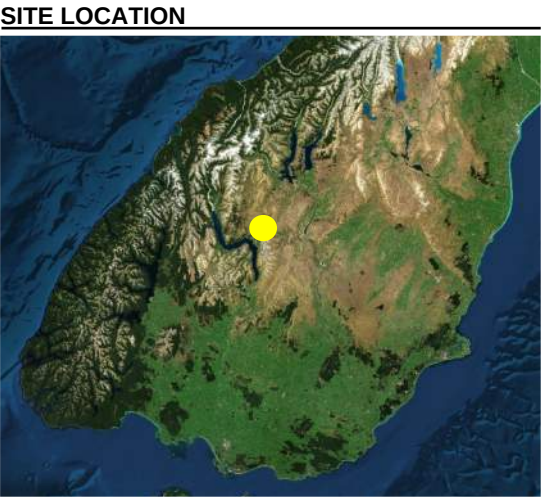
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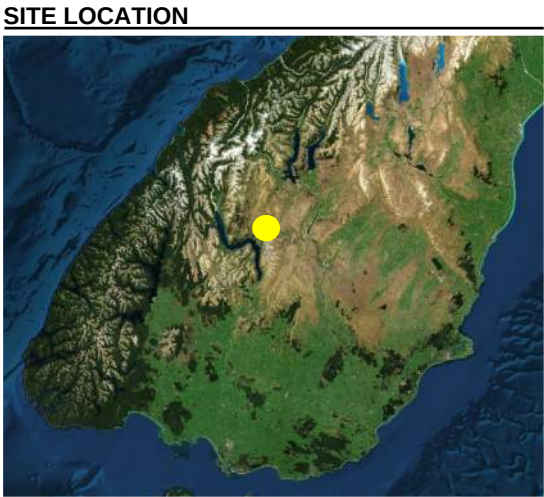
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**TITLE**  
Historical Aerial 2004

**PROJECT**

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122 Morven Ferry Road

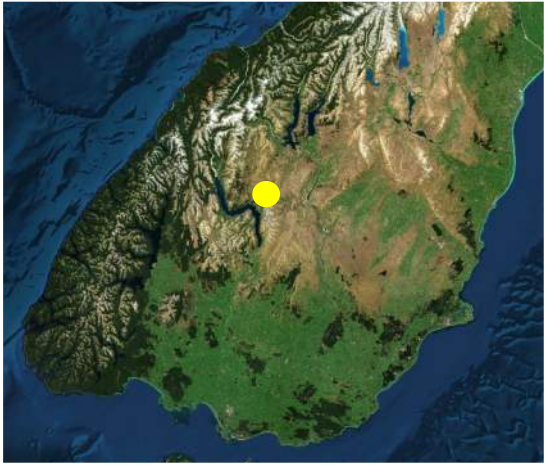
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## SITE LOCATION







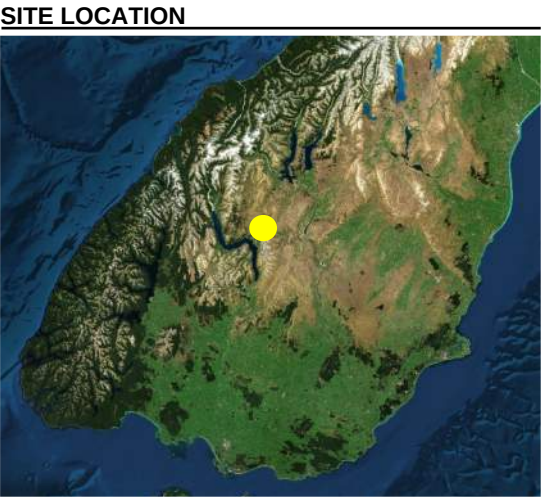
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**PROJECT**  
122 Morven Ferry Road

**CLIENT**  
Gibbons Development Limited

| ISSUE / REVISION |            |       |
|------------------|------------|-------|
| A                | 05.09.2025 | Final |
|                  |            |       |
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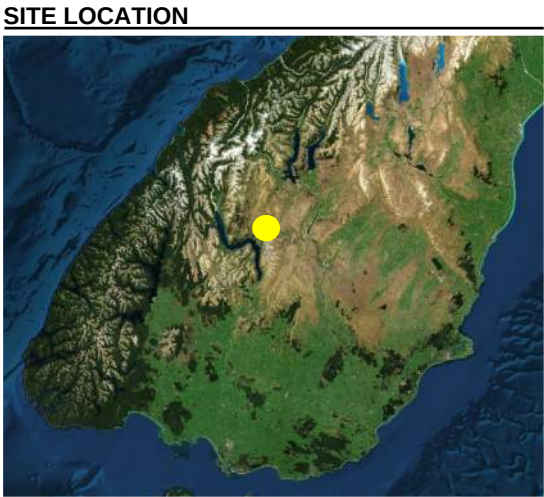
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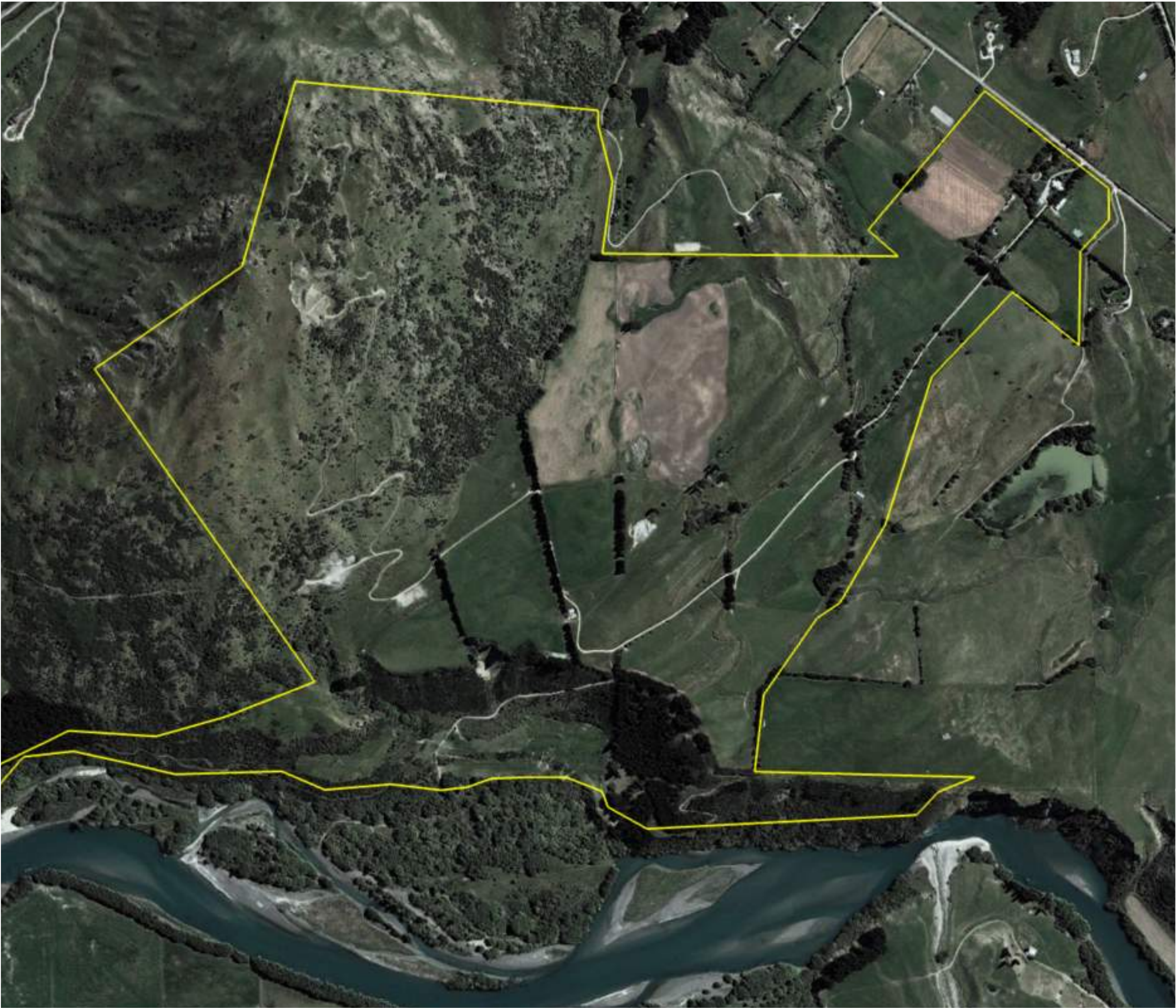
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122 Morven Ferry Road

**CLIENT**  
Gibbons Development Limited

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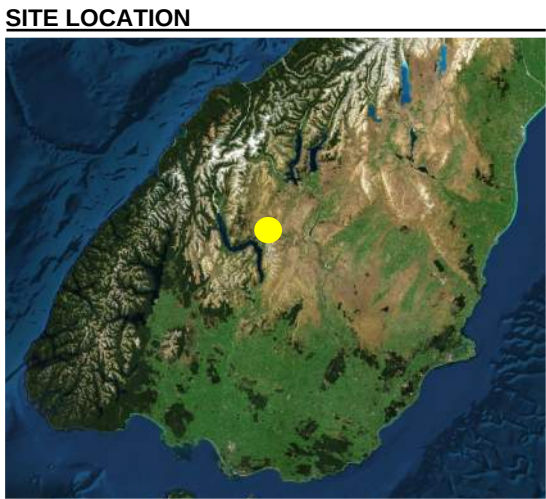
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**PROJECT**  
122 Morven Ferry Road

**CLIENT**  
Gibbons Development Limited

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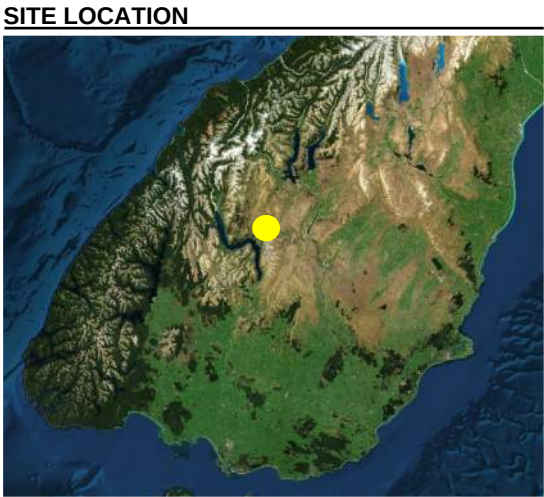
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Historical Aerial 2016

**PROJECT**  
122 Morven Ferry Road

**CLIENT**  
Gibbons Development Limited

| ISSUE / REVISION |            |       |
|------------------|------------|-------|
| A                | 05.09.2025 | Final |
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# SPRINGLINE

TITLE

Historical Aerial 2022

PROJECT

122 Morven Ferry Road

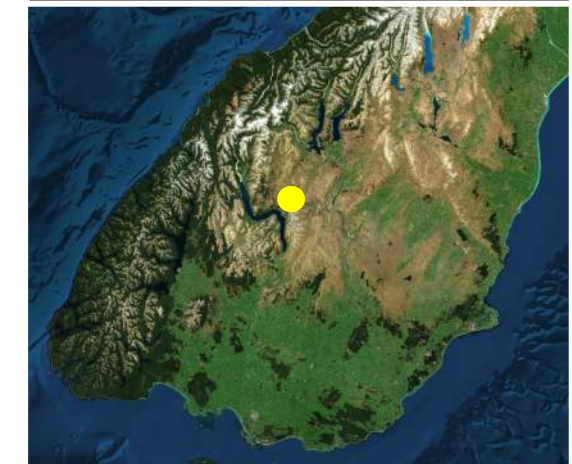
CLIENT

Gibbons Development Limited

**ISSUE / REVISION**

|   |            |       |
|---|------------|-------|
| A | 05.09.2025 | Final |
|   |            |       |
|   |            |       |
|   |            |       |

## SITE LOCATION





## Appendix D Site Photographs



Photograph 1



Residential dwelling (Area 1)

Photograph 2



Poolhouse (Area 1)



Photograph 3



In-ground swimming pool (Area 1)

Photograph 4



Steel and timber implement shed, southeast of the main dwelling (Area 1)



Photograph 5



Livestock holding shed with surrounding pens and stock races (Area 1)

Photograph 6



Painted exterior, deteriorated and flaking (Area 1)



Photograph 7



Painted exterior, deteriorated and flaking (Area 1)

Photograph 8



Livestock holding shed and pens, painted exterior, deteriorated and flaking (Area 1)



Photograph 9



Sheep spray chamber and adjacent stock pens (Area 1)

Photograph 10



Sheep spray race operation (Area 1)



Photograph 11



Sheep spray race operation (Area 1)

Photograph 12



Stock races leading to/from the spray chamber (Area 1)



Photograph 13



Stock pens between the spray chamber and livestock holding shed (Area 1)

Photograph 14



Area of the underground storage tank, with filling points and vent infrastructure visible. Stock holding pens beyond. (Area 1)



Photograph 15



Aboveground storage tank with ground surface staining visible (Area 1)

Photograph 16



Area of fuel container barrels and machinery storage, adjacent to the AST (Area 1)



Photograph 17



Farm implement shed east of the livestock holding sheds, of steel and timber construction, in poor condition. (Area 1)

Photograph 18



Paddock of the former firewood storage facility (Area 1)



Photograph 19



Livestock holding sheds in the paddocks south of the residence and farm infrastructure (Area 1)

Photograph 20



Gully in 'Area 2' with fly-tipping activities (Area 2)



Photograph 21



Fly-tipping waste comprising plastics and household waste (Area 2)

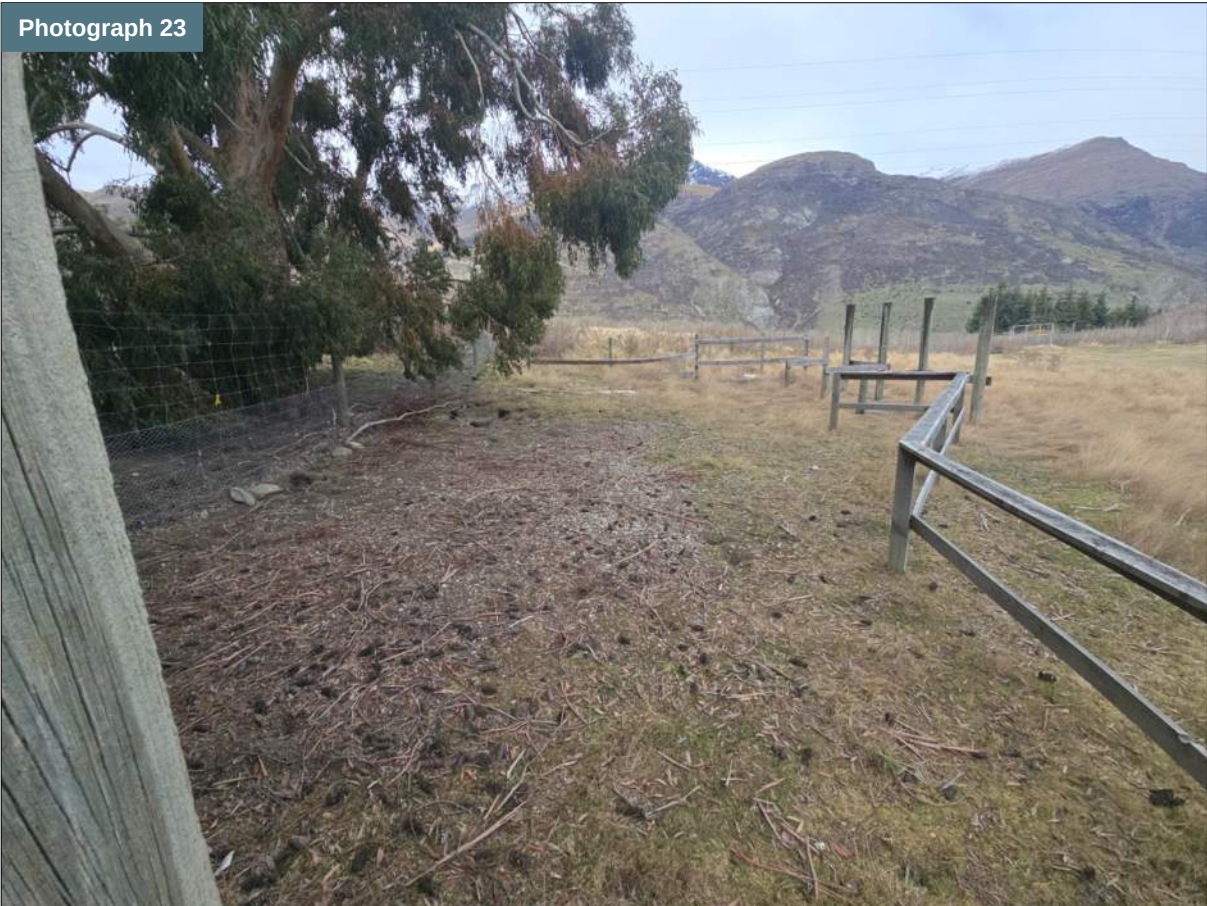
Photograph 22



Clay pigeon shooting range / facility (Area 2)



Photograph 23



Clay pigeon shooting range / facility (Area 2)

Photograph 24



Clay pigeon shooting range / facility, showing hillside in the background exposed to fall-out (Area 2)

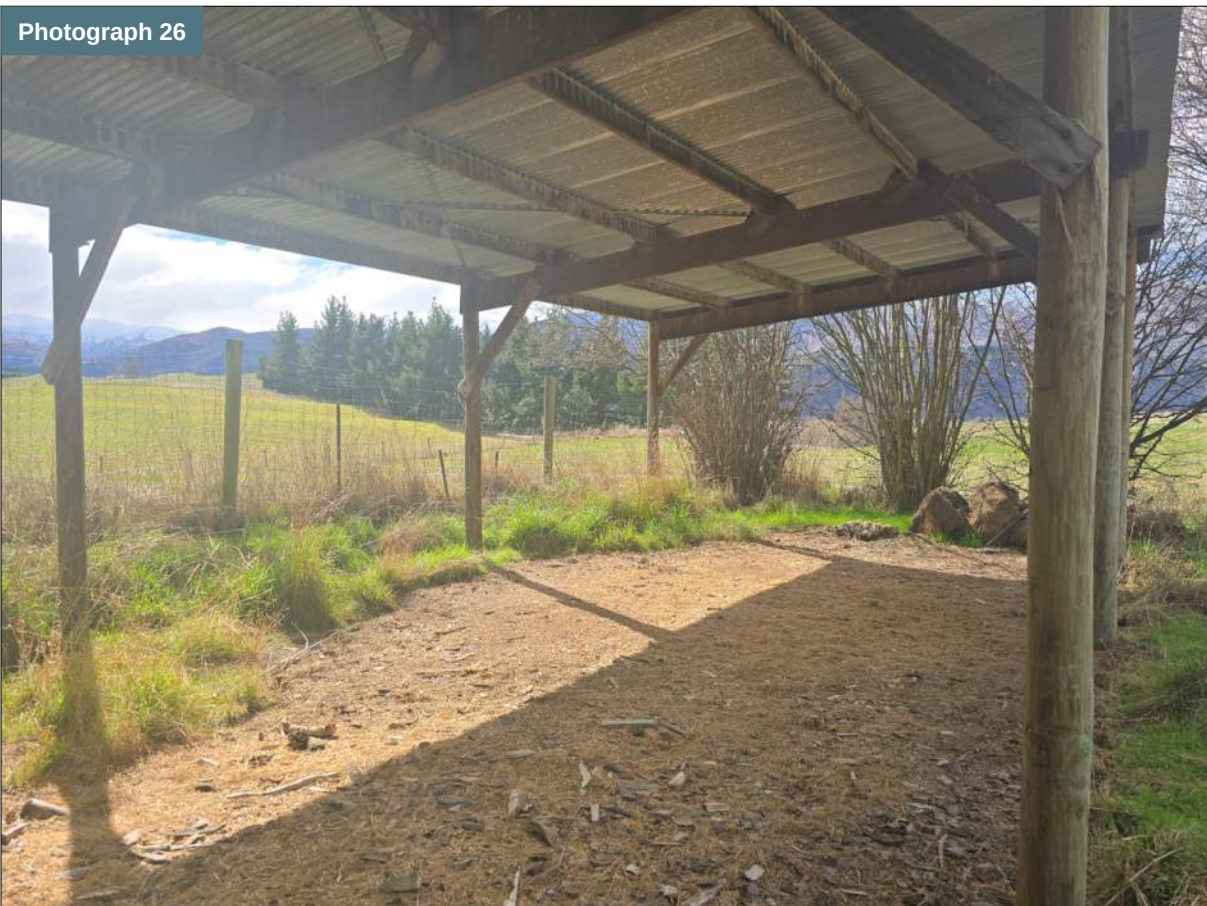


Photograph 25



Soil surface on the hillside facing the firing range with visible clay fragments and lead pellets. (Area 2)

Photograph 26



Hay shed, located in the south of Area 2 (Area 2)



Photograph 27



Hay storage in the southernmost paddock, adjacent to the river terrace (Area 2)

Photograph 28



Former quarrying site (Area 2)



Photograph 29



Former quarrying site (Area 2)

Photograph 30



Image showing typical site conditions in the central area (wider site)