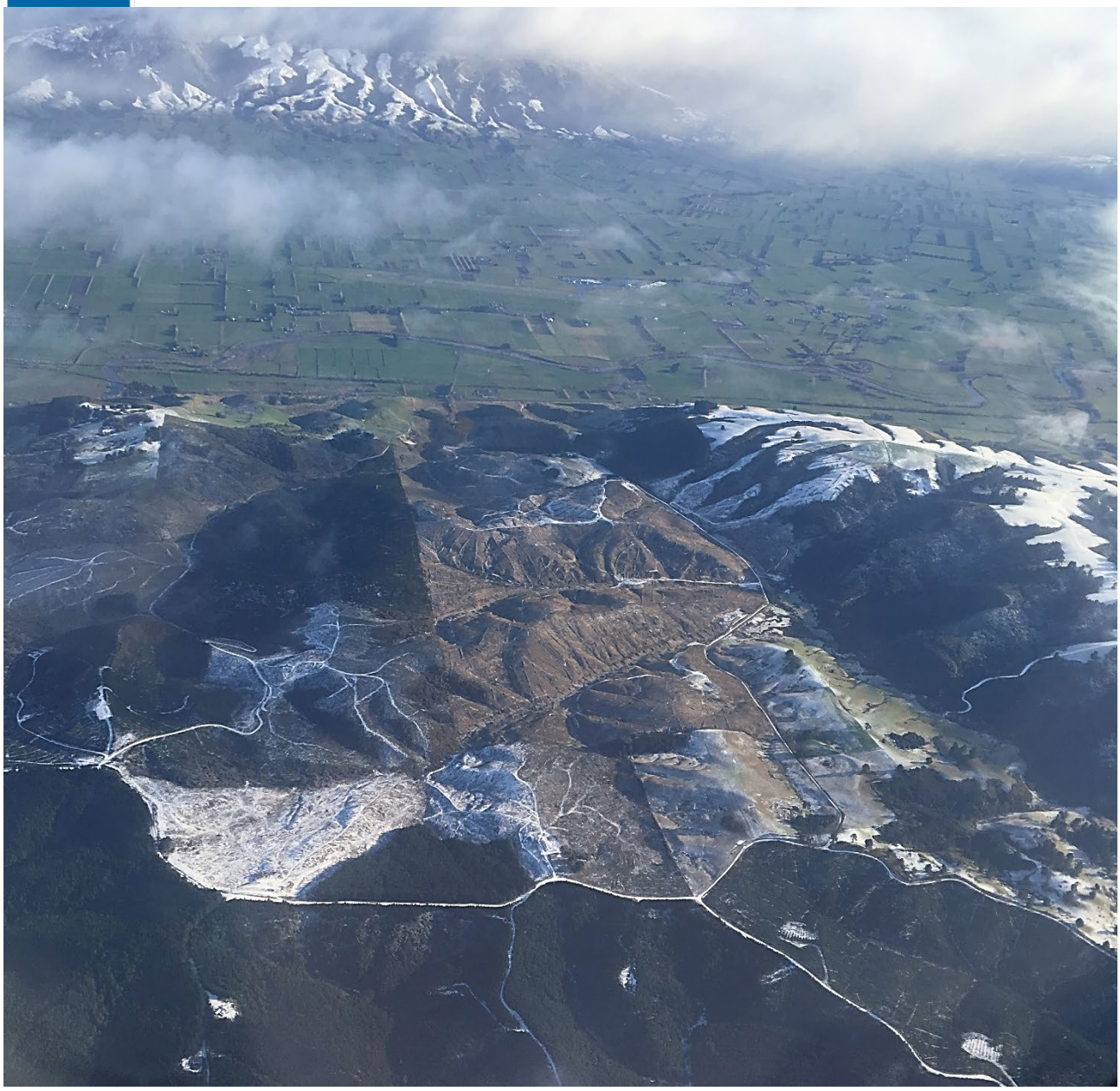
Appendix 19: Preliminary Site Investigation



Dunedin City Council

Waste Futures Phase 2 - Smooth Hill Landfill

Preliminary Site Investigation

May 2021

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1. Introduction

1.1 Introduction

Dunedin City Council (Council) collects residential waste and manages the disposal of both residential and most commercial waste generated from the Dunedin City area and environs.

The Council has embarked on the Waste Futures Project to develop an improved comprehensive waste management and diverted material system for Dunedin, including future kerbside collection and waste disposal options. As part of the project, the Council has confirmed the need to develop a new landfill to replace the Council's current Green Island Landfill, which is envisaged to reach full capacity in the next few years. Final closure could be around 2028 depending on the closure strategy adopted by the Council.

The Council commenced siting studies for a new landfill in the late 1980's and early 1990's and selected the Smooth Hill site in south-west Dunedin, as the preferred location. At that time, the site was designated in the Dunedin District Plan, signalling and enabling its future use as a landfill site. The Council also secured an agreement with the then landowner, Fulton Hogan Ltd, to purchase the land and the Council took ownership of the land in September 2020 Since the 1990's, the Council extended the life of Green Island Landfill and further development of the Smooth Hill site has been on hold.

GHD Limited (GHD) was engaged by Dunedin City Council (DCC) to undertake a Preliminary Site Investigation (PSI) for the proposed future landfill location and associated access roads. The location of the proposed landfill will be referred to as the 'Site'. The Site's location can be seen in Drawing C102 and the associated road upgrade works on Drawings C601 to C612.

1.2 Purpose

The purpose of this investigation is to:

- Inform DCC of the potential risks to human health from potential activities identified on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL)[1], which may impact the proposed works at Site.
- To inform resource consenting requirements under the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011[2] (NES CS).

1.3 Scope

To achieve the specified purpose, the following scope has been carried out:

- A review of the surrounding land use and environment
- A review of the site geology, topography and hydrology
- A review of readily available historical aerial photography to identify historical land uses and potential HAIL sites
- A review of additional contaminated land information provided by ORC
- Assessment of the primary contaminants of concern (if any)

[1] Ministry for the Environment. (2011). Hazardous Activities and Industries List. October 2011.
[2] Resource Management National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health, 2011

- Assessment of the risks to human health and the environment (if any)
- Preparation of this report presenting the findings and recommendations

1.4 Assumptions

The methodology was developed with consideration given to the following assumptions:

- Information obtained from third parties, DCC and Otago Regional Council is complete and accurate.
- The observations made during the investigation are representative of the activities that have occurred or are occurring on-Site (such as the land use assessments included in the historical review).
- The observed and inferred Site conditions are representative of the actual Site conditions and those not directly assessed.

2. Statutory Context

2.1 National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health[3]

The NESCS applies to any 'piece of land' on which an activity or industry described in the current edition of the MfE HAIL is being undertaken, has been undertaken or is '*more likely than not'* to have been undertaken (see Regulation 5(7)). The NESCS applies to any 'piece of land' in which a prescribed activity (listed in Regulation 5(2) to 5(6) is being undertaken.

Resource consent under the NESCS Regulations applies to a 'piece of land' where soil disturbance and/or removal activities are expected to exceed the following thresholds:

- The volume of the disturbance of the soil of the piece of land must be no more than 25 m^3 per 500 m^2
- Soil removal must not exceed 5 m^3 per 500 m^2 per year

The NESCS does not include criteria for environmental risk assessment. The NESCS regulates:

- Soil disturbance
- The sampling of soils for contamination assessment
- Removing or replacing all or part of a fuel storage system
- Sub-dividing land
- Changing the land use

The NESCS states that a PSI must be certified by a Suitable Qualified and Experienced Practitioner (SQEP). The NES CS provides a guide as to the expertise of the SQEP. GHD note, the reviewer and signatory of this report (Mark Ballard) meets the qualifications and experience required of a SQEP.

2.2 Otago Regional Council: Regional Plan: Waste[4]

Regional Councils are required to manage both the use of land containing elevated levels of contaminants and the discharge of contaminants from land containing elevated levels of contaminants. Therefore, Regional Councils may impose controls in addition to the NESCS Soil for human health and environmental protection.

Chapter 5 of the Otago Regional Council Regional Plan: Waste includes regulations associated with contaminated land and specifies rules that relate to the discharges of contaminants from disturbing soil on land containing contamination. Otago Regional Council has the following rules for contaminated sites:

- The disturbance of land
- The discharge of hazardous waste into water
- The discharge of hazardous waste onto or into land in circumstances that may result in that hazardous waste entering water
- The deposit of any hazardous waste, in, on or under land

[3] Ministry for the Environment. (2012). Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.
[4] Otago Regional Council, Otago Regional Council: Regional Plan: Waste, 1997

- The discharge of hazardous waste into air at or from a contaminated site; is a discretionary activity

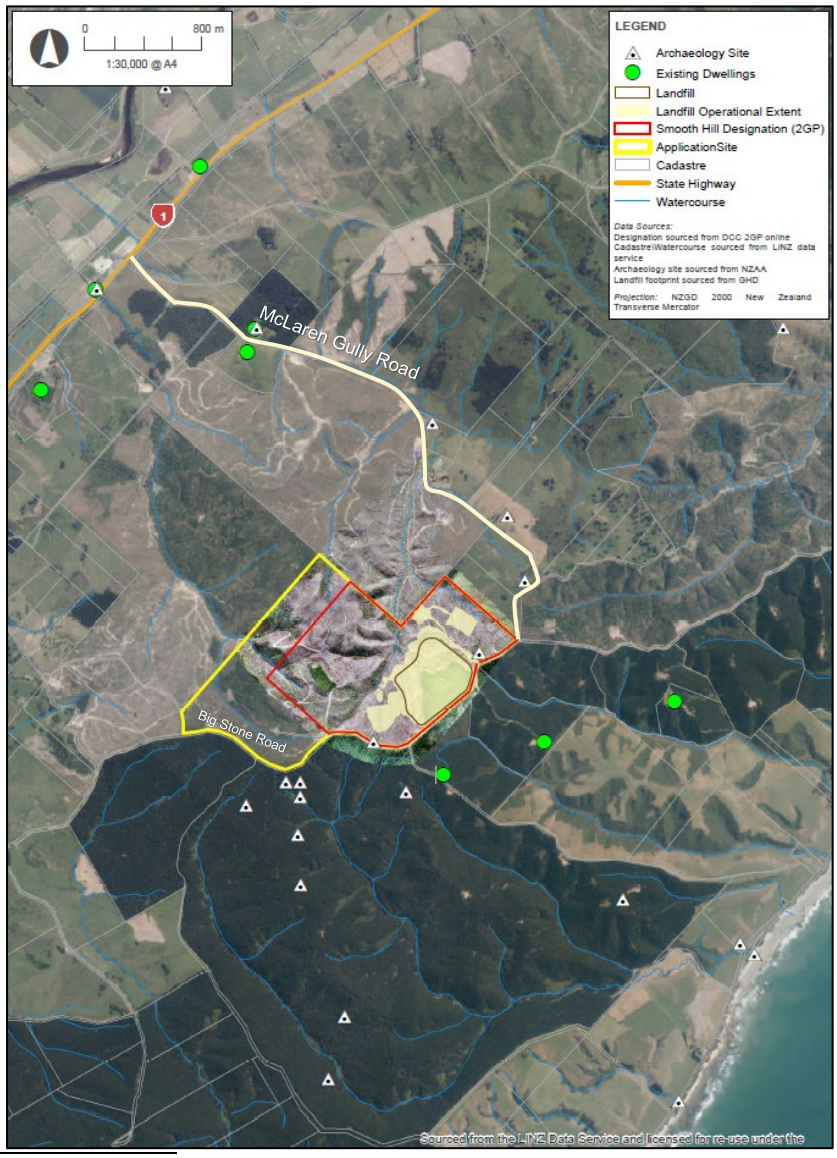
3. Site description

3.1 Site Location

The site is located approximately 28 km south-west of central Dunedin in the hills between State Highway 1 (SH1) and the coast. For the purposes of this assessment, we have assessed the entire application site, as outlined in yellow in Figure 1. Earthworks will also be required for the upgrade of access roads from SH1 to the site – namely via McLaren Gully Road and Big Stone Road to the south-eastern boundary of the site. This review also assessed both roads. Both roads are currently unsealed but will be widened, re-aligned and sealed as part of these works. The site is bounded to the north and west by forestry land (pine plantations) and to the north-east by pastoral farmland (Figure 1). Within the site, access is via a series of forestry roads and tracks. Most of the site has been logged and re-planted in the past 5 years, although minor areas of remnant native vegetation occur in the gully bottoms.

The remnants of two buildings have been identified within the site. These are discussed further in the Archaeology Report[5].

Figure 1 Proposed Smooth Hill landfill general locality features



[5] New Zealand Heritage Properties Ltd (2020), Smooth Hill Landfill Archaeological Assessment for Site No. I45/71, I45/72, I45/67, I45/80, I45/81, I45/82

3.2 Site Ownership

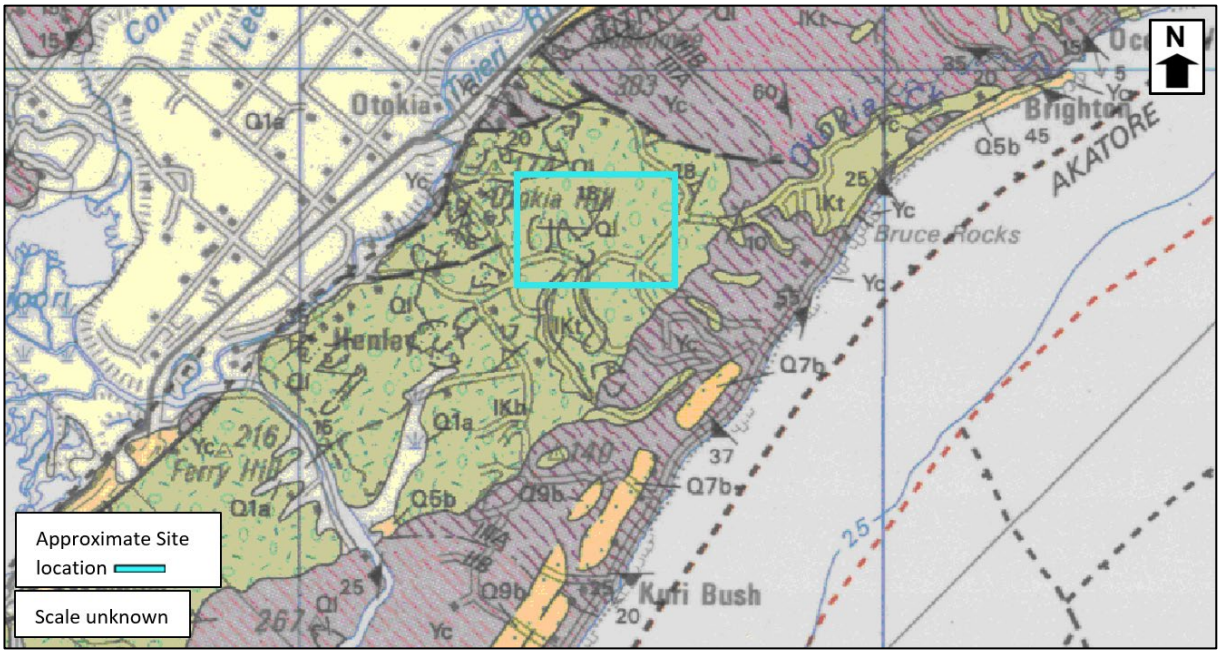
The landfill (application) site is now owned by Dunedin City Council. Previously it was owned by Fulton Hogan Limited (FH). The Council had an agreement with FH to purchase the designated land and the sale and purchase agreement was executed in 2020. In addition to the designated land purchase from FH, Council is also in discussions to purchase land to allow road corridor upgrades, including the widening and upgrade of the SH1 junction, McLaren Gully Road and Big Stone Road to the site entrance.

3.3 Geology

The Institute of Geological & Nuclear Sciences geological map for Dunedin[6] (Figure 2) shows that the Site and roads are underlain by Henley Breccia. Henley Breccia is composed of non-marine schist and semischist breccia and conglomerate, minor sandstone and coal.

Although not shown on the geological map, geotechnical investigations[7] have shown the Henley Breccia is overlain by up to 5 m of topsoil, colluvium and loess; and the presence of alluvium deposits within gullies.

Figure 2 Site Geology



3.4 Hydrology and topography

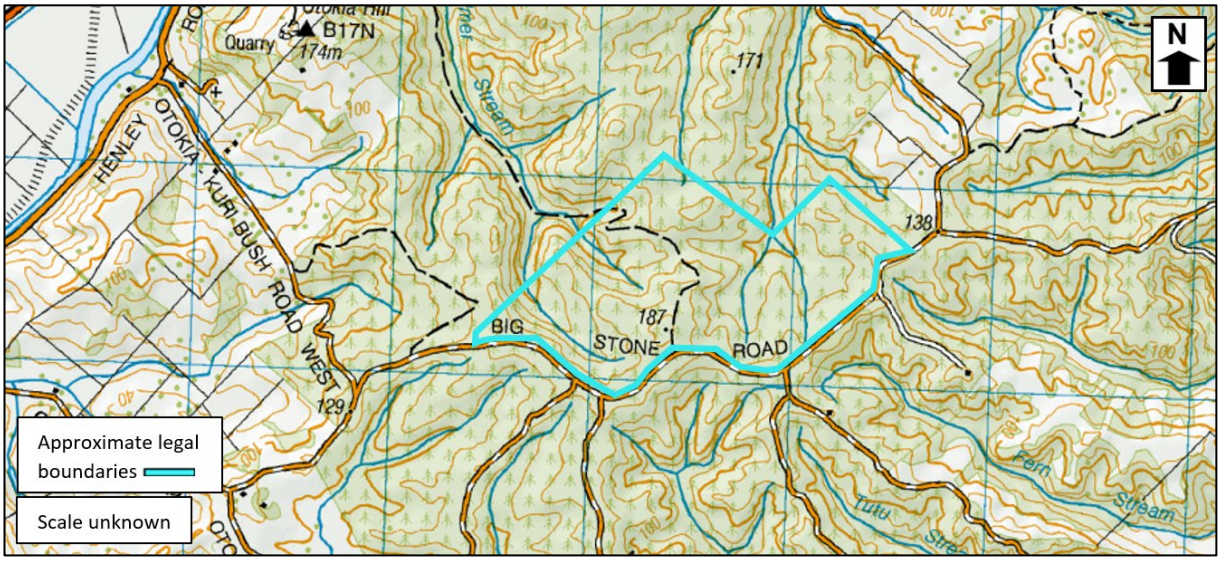
The landfill site lies within in a natural “amphitheatre”, bisected by a larger central ridge and a smaller ridge in the south-west, which are both aligned and fall from south to north within the basin of the site. The site typically has side slopes of 20%. A south to north system of gullies passes through the site, which are ephemeral and flow only after rainfall. The gullies merge into a single gully near the northern edge of the site and join a sequence of wetlands connected by a semi-permanent stream to the north of the site. During dry periods surface water flow ceases as far downstream as at least the culvert under McLaren Gully Rd and surface water retreats to a series of disconnected wetlands. Further downstream from the McLaren Gully Road culvert, the stream joins the Otokia Creek that ultimately flows to the coast near Brighton, approximately 10 km north-east of the landfill site.

[6] Edbrooke, S.W. (compiler) (2001), Geology of the Dunedin area. Institute of Geological and Nuclear Sciences 1:250 000 geological map 21
[7] GHD (2021), Waste Futures - Smooth Hill Landfill Geotechnical Factual Report

Big Stone Road runs along a ridge on the south-eastern edge of the site and is the catchment divide. To the south of Big Stone Road the land drains directly to the Pacific Ocean via a series of gullies and streams (from north to south Graybrook Stream, Fern Stream, Tutu Stream and Flax Stream).

McLaren Gully Road runs from a junction with Big Stone Road just to the northeast of the site in a northwest direction towards SH1. The road crosses a number of streams and galleys before joining SH1 on the edge of the Taieri Plains.

Figure 3 Site topography



4. High-level Preliminary Site Investigation

4.1 Historical aerial review

As a part of this PSI, GHD completed a historical aerial image review of the Site and the works required for the upgrade of the roads. The images used for the historical aerial review were sourced from Land Information New Zealand (LINZ), Retrolens Historical Image Resource and Google Earth. Limited aerials were available for review. Aerial photographs from 1958 to 2019 were reviewed and are provided in **Appendix A**. The review found that the Site has been used for forestry purposes from 1958 to today. No evidence of HAIL activities were identified in the aerial review.

4.2 Council information

GHD contacted Otago Regional Council (ORC) as part of this PSI and viewed the ORC HAIL map database[8]. No HAIL sites were identified within the two legal parcels or on the parcels adjacent to McLaren Gully Road or Big Stone Road. The closest HAIL site identified was Otokia Cemetery, approximately 2 km northwest of the site at Otokia on SH1.

4.3 Conclusion

GHD has examined existing records of the site and road upgrades from ORC and historical aerial photography in relation to the proposed landfill site and road upgrades. As HAIL activities have not been identified, the NESCS does not apply to the works associated with development of the landfill site and associated road upgrades and therefore an NESCS consent is not required.

8 https://maps.orc.govt.nz/portal/apps/MapSeries/index.html?appid=052ba04547d74dc4bf070e8d97fd6819

5. Limitations

This report: has been prepared by GHD for Dunedin City Council and may only be used and relied on by Client for the purpose agreed between GHD and the Client as set out in Section 1 of this report.

GHD otherwise disclaims responsibility to any person other than the Client and Council officers, consultants, the hearings panel and submitters associated with the resource consent and notice of requirement process for the Smooth Hill Landfill Project arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Client and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Appendices

Appendix A – Historical Aerial Review

Historical aerial review

Notes:

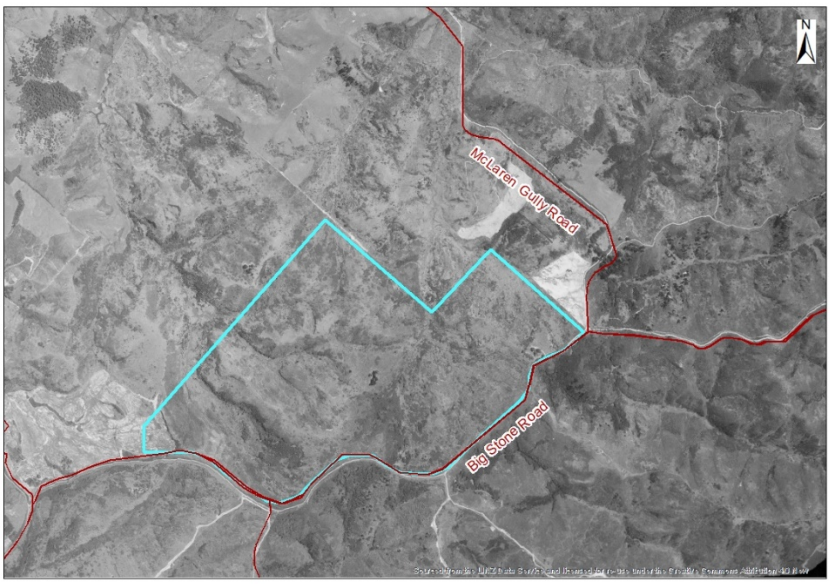
The images below have been sources from Google Earth Pro[1] and Retro Lens Historical Image Resource [2].

The approximate location of the sites legal parcels have been outlined in blue.

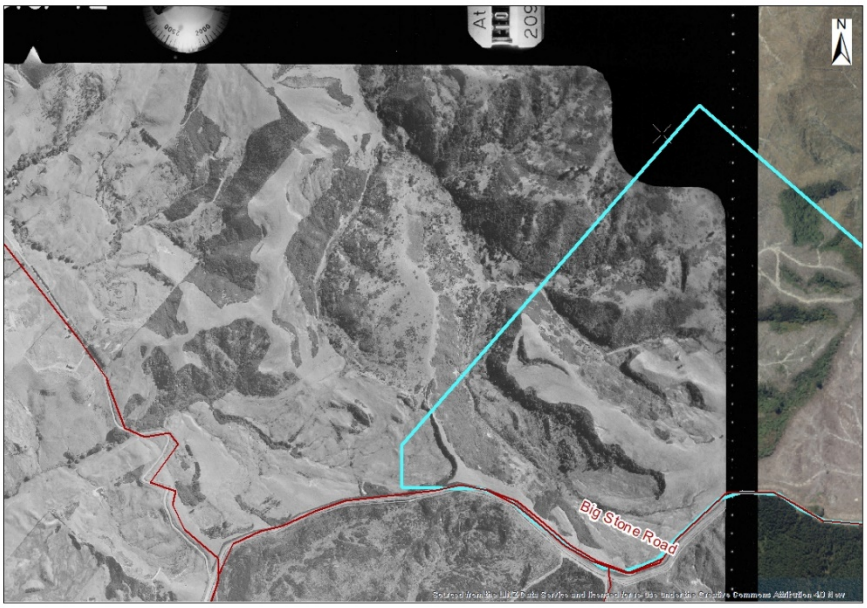
Scale for the images is unknown and differs per aerial image.

1958

1967



[1] Google Earth Pro
[2] http://retrolens.nz/

1973	
1979	

2003	 N McLaren Gully Road Big Stone Road
2009	 N McLaren Gully Road Big Stone Road Image © 2021 Maxar Technologies

2019	 N McLaren Gully Road Big Stone Road Image © 2021 Maxar Technologies

This report has been prepared in part by Laura Bell at GHD Ltd. A scientist with over 10 years relevant experience. This report has been reviewed by Mark Ballard, an Associate and Technical Director at GHD Ltd. Mark has over 20 years experience in contaminated land assessment and remediation. He has a BSc in Geology & Physical Geography and an MSc in Hydrogeology. He is also a Certified Environmental Practitioner (CEnvP) under the Environmental Institute of Australia and New Zealand accreditation scheme. GHD considers that Mark meets the criteria of a Suitably Qualified and Experienced Practitioner (SQEP) as per the guidance provided in the NES CS.

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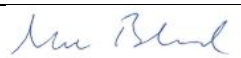
Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Rev01	Laura Bell	Mark Ballard		Stephen Douglass		27-05-21

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