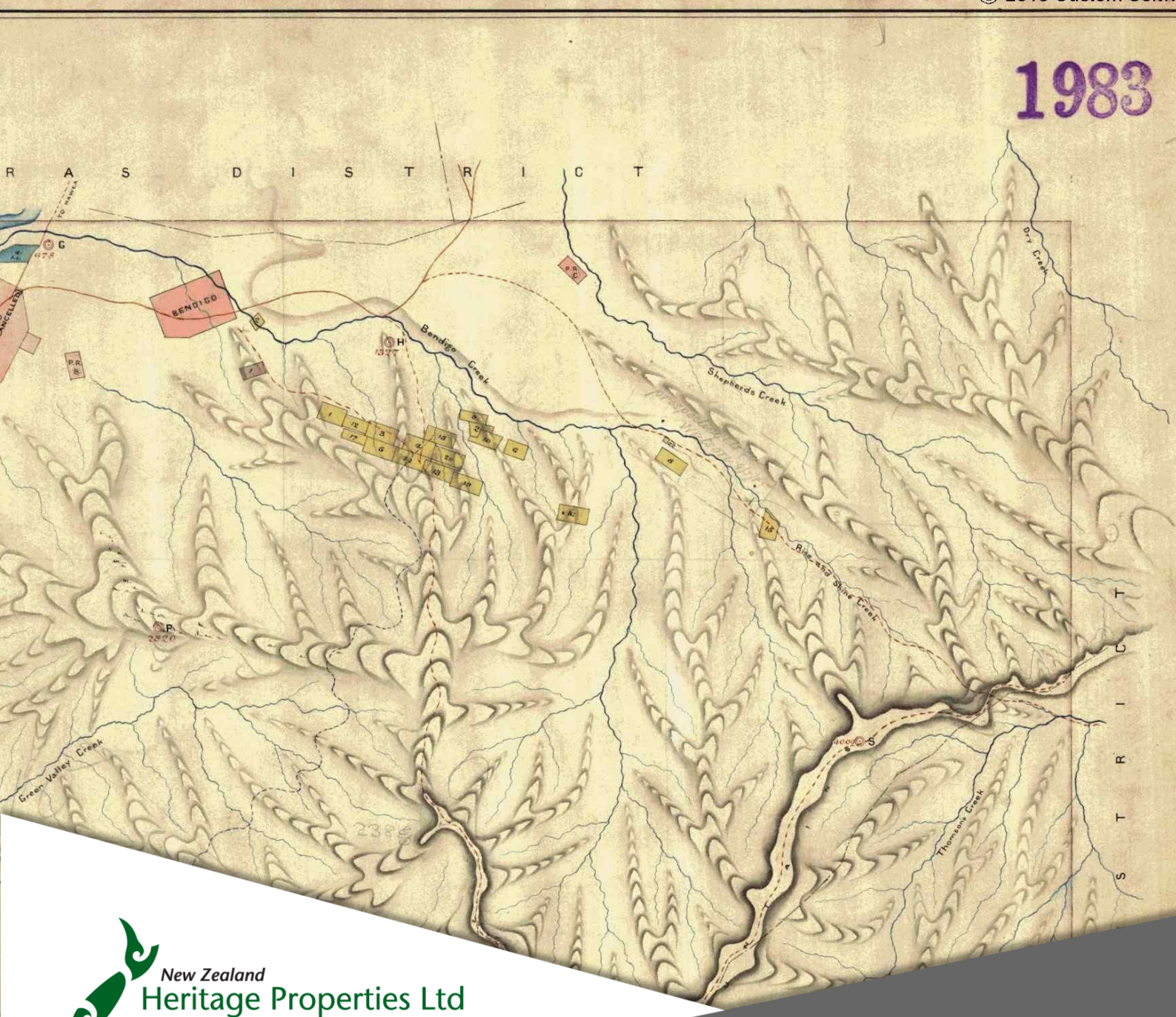

New Zealand
Heritage Properties Ltd
Investing In Our Heritage

The Bendigo-Ophir Gold Project

A Heritage Assessment

Report Prepared for Matakanui Gold Ltd
Author: Dr Naomi Woods and Claire Thorrold
Reviewed by: Dawn Cropper and Megan Lawrence

New Zealand Heritage Properties Ltd
Investing In Our Heritage

The Bendigo-Ophir Gold Project

A Heritage Assessment

Prepared by New Zealand Heritage Properties Ltd
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Project Details

Legal Description and Landowners	See Appendix B for list of affected land parcels and landowners/leaseholders
Archaeological Site No.	G41/4, G41/5, G41/6, G41/251, G41/256, G41/264, G41/265, G41/266, G41/267, G41/269, G41/273, G41/277, G41/584, G41/586, G41/589, G41/604, G41/605, G41/606, G41/658, G41/678, G41/782, G41/783, G41/784, G41/785, G41/786, G41/787, G41/788, G41/789, G41/790, G41/792
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Report Submitted To	Matakanui Gold Ltd, Heritage New Zealand Pouhere Taonga, Department of Conservation, Central Otago District Council
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Document Control

Revision No.	Date Submitted	Description	Prepared By	Reviewed By
A	11/4/2025	Issued to Client	NW, CT	DC, ML
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Ownership and Disclaimer

Cover Photo: *Farquhar, H, 1884. SO 1983 – Topographical Plan of Part of Wakefield District.*

Executive Summary

New Zealand Heritage Properties Ltd (NZHP) has been commissioned by Matakanui Gold Ltd (MGL) to undertake a heritage assessment of the Bendigo-Ophir Gold Project (BOGP) area. Matakanui Gold Ltd is proposing to establish an open pit and underground gold mine within the project area. The areas of highest heritage values of both the Bendigo Covenant area and the Bendigo Quartz Reef Historic Area **fall outside the BOGP footprint and will not be impacted by the proposed works**

Further to this assessment, the following reports outline subsequent assessments on other parts of the project, namely:

1. BOGP Construction Camp, Bendigo (J012084_Camp HA)
2. BOGP magazine and Emulsion Tank (J012082_Magazine Emulsion Tank 2025)
3. Ardgour Rise Realignment (J012109_AGR_April 2025)
4. CIT Track (J012137_CIT Track_April 2025)

The research undertaken for this assessment has shown that 17 previously recorded and 12 new sites recorded during the survey phase of this work will be affected by the proposed works. Eleven of the previously recorded sites and nine of the new sites will be destroyed by the proposed works. Two additional sites fall within the project area (G41/4 – Rabbiter's Hut, and G41/5) but these will be protected during the works, with the intention for G41/4 to be adaptively re-used in the future. Short sections of the Rise and Shine race (G41/584), Come-in-Time race (G41/586), race G41/6 and two newly recorded races (G41/790 and G41/792) will be destroyed but all extend outside the project area and as such most of their extents will not be impacted. A significant portion of the Matakanui-Bendigo Road (G41/782) will be destroyed, but parts of this feature extend outside the project area. Small portions of site G41/251 and G41/256 will also be removed. The project area also sits on the edge of the Bendigo Quartz Reefs Historic Area (List No. 9097), and within the area covered by the Bendigo Conservation Covenant. Potential also exists for additional mining, pastoral and transport/communication features to be encountered throughout the project area, along with a low risk of encountering sites relating the manawhenua use of an ara tawhito that passed over Thomsons Saddle.

The recorded sites are considered to individually have low to medium-high archaeological values, and potential unrecorded sites may hold low to medium-high values. Due to the nature of the proposed works, the overall impact of the works on the archaeological values of both recorded and unrecorded sites will be major, with the exception of sites G41/251, G41/256, G41/584 and G41/586 which will be impacted to a minor degree, and sites G41/4 and G41/5 which will not be impacted. Of those subject to major impacts the majority have low archaeological value with 13 that have low, one had low-medium, and nine have medium archaeological value. Of those subject to minor impacts, three have low, two have medium and two have medium-high archaeological values. Importantly, the remaining two sites with medium-high archaeological values will not be impacted.

This archaeological and heritage assessment has identified five distinct but interconnected heritage complexes within the BOGP disturbance footprint (McLean's pre-emptive rights complex, the Rise and Shine workings, Come-in-Time workings, Shepherds Creek valley and the Matakanui-Bendigo Road). These have been assessed as holding medium-high, high, high, medium and low heritage values, respectively. The proposed works will have a major impact on the heritage values of each of these heritage complexes and a moderate impact on the Bendigo Quartz Reefs Historic Area and Bendigo Conservation Covenant area. **However, the areas of highest heritage values of both the Bendigo Covenant area and the Bendigo Quartz Reef Historic Area fall outside the BOGP footprint and will not be impacted by the proposed works**. Comparable examples of all sites affected by the proposed works can be found elsewhere in the Bendigo Covenant area and the Bendigo Quartz Reef Historic Area, and are generally better maintained, more accessible and visited more regularly by the public than those proposed for removal. The recommended mitigation outlined in Section 10.3.3, would go some way to mitigate and offset the adverse effects, reducing the overall impacts of the works.

Summary of effects on heritage sites within the proposed Bendigo-Ophir Gold Project area. Sites are colour coded to show their association to the site complexes identified by NZHP, with Mclean's pre-emptive rights area in orange, Rise and Shine in blue, Come-in-Time in green, and Shepherds Creek in grey.

Historical Background					Heritage and Archaeological Protection		Assessment of Effects on Archaeological Values		Assessment of Effects on Archaeology	
Arch Site	Site Name	Site Type	Date Range	Known Associations	Heritage Protection Status	HNZPT Act 2014	Significance	Magnitude of Impact	Effect on Structure(s)	Effect on Subsurface Archaeology
G41/4	Rabbiter's Hut	Pastoral/ agricultural	c.1860s	Morven Hills Station	-	Yes	Medium-High	No Impact	N/A	N/A
G41/5		Pastoral/ agricultural	c.1860s	Morven Hills Station	-	Yes	Medium-High	No Impact	N/A	N/A
G41/6		Mining-gold	Pre-1900	-	-	Yes	Low	Major	Partial removal	Partial removal
G41/251	Come-in-Time Battery	Mining-gold	1880s-1930s	Come-in-Time and Alta Syndicates, David Betts	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area (outside of current project area)	Yes	Medium-High	Minor	N/A	Partial removal
G41/256		Mining-gold	Pre-1900	-	Bendigo Conservation Covenant	Yes	Low	Minor	N/A	Partial removal
G41/264	Rise and Shine Gold Workings	Mining-gold	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	N/A	Full removal
G41/265		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/266		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/267		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/269	Rise and Shine Dam	Mining-gold	1870s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/273		Historic-domestic	Potentially Pre-1900	-	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Potentially	Low	Major	Full removal	Full removal
G41/277	Rise and Shine Mine and Battery	Mining-gold	1870s-1940s	Rise and Shine, Eureka, Jubilee, Bendigo Rise and Shine, and Shine Again Syndicates	Bendigo Conservation Covenant	Yes	Medium	Major	N/A	Full removal
G41/584	Rise and Shine Water Race	Mining-gold	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Minor	Partial removal	Partial removal
G41/586	Come-in-Time Water Race	Mining-gold	1870s-1900s	Come-in-Time Syndicate	Bendigo Conservation Covenant	Yes	Medium	Minor	Partial removal	Partial removal
G41/589		Transport-communication	Potentially Pre-1900	-	Bendigo Conservation Covenant	Potentially	Low	Major	Full removal	Full removal
G41/604		Mining-gold	Potentially 1880s-1910s	Alta Syndicate, potentially Come-in-Time syndicate	Bendigo Conservation Covenant	Yes	Medium	Major	N/A	Full removal
G41/605		Mining-gold	Potentially 1880s-1910s	Alta Syndicate, potentially Come-in-Time syndicate	Bendigo Conservation Covenant	Yes	Medium	Major	N/A	Full removal
G41/606		Historic-domestic	Potentially Pre-1900	-	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Potentially	Low	Major	Full removal	Full removal
G41/658		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Low-Medium	Major	Full removal	Full removal
G41/678		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Minor	Full removal	Full removal
G41/782	Matakanui-Bendigo Road	Transport-communication	1898+	-	-	Yes	Low	Major	Partial removal	Full removal
G41/783		Transport-communication	Unknown	-	Bendigo Conservation Covenant	Potentially	Low	Major	N/A	Full removal
G41/784		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Minor	N/A	Partial removal
G41/785		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/786		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/787		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/788		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/789		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/790		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	Partial removal	Partial removal
G41/792		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Minor-moderate	Partial removal	Partial removal

On the basis of this assessment, NZHP makes the following recommendations for an application to **uplift part of the Bendigo Conservation Covenant**:

1. Mitigation for partial uplift of the Covenant must be commensurate with the impact to the values identified in this assessment, and should be project based.
    a. Appropriate projects should be agreed upon between MGL and DOC.
2. All sites within the uplifted area but outside the BOGP disturbance footprint must be protected during the life of the mine.
    a. Provisions for protection of these sites are outlined in the Archaeological and Heritage Management Plan (AHMP).

NZHP makes the following recommendations for an **archaeological authority under the HNZPTA 2014**:

1. **Authority Application:** As the proposed works described in Section 1.2 will affect the sites summarised in Table 11-1, an archaeological authority under Section 44 of the HNZPTA 2014 must be obtained from HNZPT prior to any modification of the sites.
    a. If development plans are altered from those reviewed for this assessment then HNZPT and NZHP must be alerted, as any changes may alter the assessment of effects or invalidate the authority.

2. **Protection of sites/features:** As a first principle, every practical effort must be made to avoid damage to any heritage site, whether known, or discovered during any redevelopment of the site.
    a. Site G41/4 (Rabbiter's Hut) must be protected during works and any modifications for its future adaptive re-use may require a separate archaeological authority.
    b. No works will take place within the fenced boundary around site G41/5.
    c. No earthworks are to take place outside the project area as shown in Figure 1-1 and no topsoil or other overburden is to be stored within 10m of any previously recorded heritage site or those additional POI identified by NZHP.
    d. The points at which the Rise and Shine race (G41/584), Come-in-Time race (G41/586), race G41/6 and newly recorded G41/790 water race enter the project area must be marked by semi-permanent timber survey pegs and avoided.

3. **Management Plan**: All works must be carried out in accordance with the archaeological and heritage management plan (AHMP). Any amendments to the management plan will require prior written approval from HNZPT and CODC.

4. **Contractor Briefing:** All contractors working on the project must be briefed by the s45 approved person (or person nominated on their behalf) on the possibility of encountering archaeological evidence, how to identify possible archaeological sites/features during works, the archaeological work required by the conditions of the authority, and contractors' responsibilities with regard to notification of the discovery of archaeological evidence to ensure that the authority conditions are complied with.

5. **Recording of Water Races:** The affected portions of the Rise and Shine (G41/584) and Come-in-Time (G41/586) water races are to be recorded to a Level II standard as defined in HNZPT's guide, *Investigation and Recording of Buildings and Standing Structures* (HNZPT, 2018), and the full extent of each race digitally mapped. Affected portions of water races G41/6 and G41/790 are to be recorded to a Level III standard. Details of the recommended recording are provided in the AMP.

6. **Recording of Stone Huts and Dams:** The stone huts (G41/265, G41/266, G41/267, G41/273 and G41/606) and dam (G41/269) are to be recorded to a Level II standard as defined in HNZPT's guide, *Investigation and Recording of Buildings and Standing Structures* (HNZPT, 2018). Details of the recommended recording are provided in the AMP.

7. **Recording of Stone Culverts and Revetments:** The stone culverts and revetments (G41/589 and G41/782) are to be recorded to a Level II standard as defined in HNZPT's guide, *Investigation and Recording of Buildings and Standing Structures* (HNZPT, 2018). Details of the recommended recording are provided in the AMP.

8. **Archaeological Monitoring:** All earthworks that may affect an archaeological site must be monitored by the s45 approved person (or person nominated on their behalf) in accordance with the management plan.
    a. An archaeologist must monitor all earthworks within recorded archaeological sites until virgin ground is encountered.
    b. Any archaeological features and material encountered shall be recorded, analysed, and interpreted in accordance with current archaeological practice and as outlined in the management plan.
    c. Works outside the extent of recorded sites can proceed under On-Call Protocols.

9. **Archaeology of Māori origin:** If archaeological material of Māori origin is discovered at any stage, all work must stop within 20m of the find. NZHP will assist the authority holder in contacting all relevant parties including takata whenua via Aukaha and HNZPT and in accordance with the AMP.
    a. Any taoka tūturu are *prima facie* the property of the Crown who will be notified of the find. Taoka tūturu will be registered with the Ministry for Culture and Heritage. NZHP, in collaboration with manawhenua, shall notify the Ministry of Culture Heritage and establish the most appropriate temporary storage, management and care for taoka tūturu, until such time as traditional or actual ownership is determined, with an appropriate institution or kaitiaki.

10. **Kōiwi (human remains):** Should kōiwi be encountered, all work must stop within 20m of the find. NZHP will assist the authority holder in contacting all affected parties as soon as practicable, including takata whenua via Aukaha, HNZPT, and the police. The Ngāi Tahu policy for kōiwi takata shall also be followed (Te Rūnanga o Ngāi Tahu, 2019).

11. **Public Outreach:** The results of the archaeological investigations, including reports, photographic records of the features and sites, and any digital 3D models should be made available to the public via the Cromwell Museum.

12. **Reporting:**
    a. Within 20 working days of the completion of on-site archaeological work, the site record forms must be updated or submitted to ArchSite.
    b. Within 12 months of the completion of on-site archaeological work, a final report on any archaeological material that is found must be prepared in accordance with *ASG12 Archaeological Report Guideline* (HNZPT, 2023) and submitted to HNZPT for inclusion in the digital library, to Cromwell Museum and the NZAA Central Filekeeper.

In addition, NZHP recommends that the following conditions be included in a **Resource Consent under the RMA 1991**:

1. **Recording of Twentieth Century Heritage:** Features within sites identified in this report that post-date 1900 should be recorded following the procedures outlined for comparable archaeological sites and features described above. The results of these investigations should be included in the same report as the archaeological results.

2. **Management Plan**: All works must be carried out in accordance with the archaeological and heritage management plan (AHMP). Any amendments to the management plan will require prior written approval from HNZPT and CODC.

3. **Reporting:** MGL must ensure the final report on the heritage investigations is made publicly available.

4. **Artefacts:** All archaeological and twentieth century artefacts collected during the proposed works should be retained and offered to the Cromwell Museum.

5. **Re-use of materials**: Stone from the stone huts, dam, culverts and revetments should be repurposed for landscaping or other purposes where it will be visible to future visitors to the project area or offered to Cromwell Museum or other local heritage organisations for re-use. Prior to their re-use, all stone should be kept in a secure storage location, with material from each site stored discretely to preserve the provenance.

6. **Post-Mining Interpretation:** As part of the remediation plans following the end of the mine's life, the results of the heritage site recording should be used to inform interpretive signage within publicly accessible areas of the project area:
    a. The paths of water races G41/584 and G41/586 should be marked on the landscape through trail posts or interactive signage at the entry and exit points of the races to the mining footprint.

Summary of recording requirements for sites impacted by the Bendigo-Ophir Gold Project

Site No.	Recording Requirements
G41/6	• Affected portions of race recorded to **Level III** standard prior to and during modification, as outlined in AMP • Shapefile to be produced showing extent of destroyed portions
G41/251	• Map of all features within project area using GNSS prior to modification • Photographic record of all identified features • Cross section of mine drive recorded • Topsoil cleared in stages under archaeological supervision • All archaeological/heritage features recorded • Any structures recorded to **Level II** standard
G41.256	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/264	• Map of all features within project area using GNSS prior to modification • Photographic record of all identified features • Drone survey of site • Topsoil cleared in stages under archaeological supervision • Representative sample of tailings/mullock piles sampled • All archaeological/heritage features recorded • Any structures recorded to **Level II** standard
G41/265	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around hut under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/266	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around hut under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/267	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around hut under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/269	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around dam under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/273	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around hut under supervision by archaeologist prior to deconstruction

Site No.	Recording Requirements
	• Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/277	• Map of all features within project area using GNSS prior to modification • Photographic record of all identified features • Drone survey of site • Topsoil cleared in stages under archaeological supervision • Representative sample of tailings/mullock piles sampled • All archaeological/heritage features recorded • Any structures recorded to **Level II** standard
G41/584	• Vegetation cleared by hand under supervision by archaeologist • Affected portions of race recorded to **Level II** standard prior to modification, as outlined in AMP • Shapefile to be produced showing extent of destroyed portions
G41/586	• Vegetation cleared by hand under supervision by archaeologist • Affected portions of race recorded to **Level II** standard prior to modification, as outlined in AMP • Shapefile to be produced showing extent of destroyed portions
G41/589	• Vegetation cleared by hand under supervision by archaeologist • Structure (revetment) recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around revetment under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction
G41/604	• Map of all features within project area using GNSS prior to modification • Photographic record of all identified features • Drone survey of site • Topsoil cleared in stages under archaeological supervision • All archaeological/heritage features recorded • Any structures recorded to **Level II** standard
G41/605	• Map of all features within project area using GNSS prior to modification • Photographic record of all identified features • Drone survey of site • Topsoil cleared in stages under archaeological supervision • All archaeological/heritage features recorded • Any structures recorded to **Level II** standard
G41/606	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around hut under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/658	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/678	• Vegetation cleared by hand under supervision by archaeologist • Structure recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around hut under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/782	• Vegetation around identified structures cleared by hand under supervision by archaeologist • Culverts and revetments recorded to **Level II** standard, including sufficient photographs to undertake photogrammetry • Topsoil scrape undertaken around structures under supervision by archaeologist prior to deconstruction • Archaeological monitoring of deconstruction • All stone to be securely stored with provenance information for future re-use
G41/783	• Vegetation cleared by hand under supervision by archaeologist • Affected portions of track recorded prior to modification • Cross section of track recorded • Shapefile to be produced showing extent of destroyed portions
G41/784	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/785	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/786	• Map of site using GNSS prior to modification • Photographic record of all identified features

Site No.	Recording Requirements
	• Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/787	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/788	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/789	• Map of site using GNSS prior to modification • Photographic record of all identified features • Vegetation cleared by hand under supervision by archaeologist • Topsoil scrape undertaken around terrace under supervision by archaeologist prior to modification • All archaeological/heritage features encountered during modification investigated and recorded
G41/790	• Vegetation cleared by hand under supervision by archaeologist • Affected portions of race recorded to **Level III** standard prior to modification, as outlined in AMP • Shapefile to be produced showing extent of destroyed portions
G41/792	• Vegetation cleared by hand under supervision by archaeologist • Affected portions of race recorded to **Level III** standard prior to modification, as outlined in AMP • Shapefile to be produced showing extent of destroyed portions

Abbreviations

Abbreviation	Definition
AMP	Archaeological Management Plan
BOGP	Bendigo-Ophir Gold Project
CIT	Come-in-Time
CODC	Central Otago District Council
CODP	Central Otago District Plan
DoC	Department of Conservation
ELF	Engineered Landform
HNZPT	Heritage New Zealand Pouhere Taonga
HNZPTA 2014	Heritage New Zealand Pouhere Taonga Act 2014
MGL	Matakanui Gold Ltd
NZAA	New Zealand Archaeological Association
NZHP	New Zealand Heritage Properties Limited
OCP	On-Call Protocols
POI	Point of Interest
RAS	Rise and Shine
SHR	Srex
SRE	Srex East
RMA 1991	Resource Management Act 1991
TSF	Tailings Storage Facility

Glossary

The following terms were sourced from the Kāi Tahu Ki Otago Natural Resources Management Plan (Kāi Tahu Ki Otago, 2005) and Heritage New Zealand Pouhere Taonga (HNZPT, 2014).

Te Reo Māori	English
Hapū	Sub-tribe, extended whānau
Iwi	Tribe
Kāi Tahu ki Otago	The four Papatipu Rūnaka and associated whānau and rōpū of the Otago Region
Kāika/Kaik/Kāinga	Settlement, place of residence
Karakia	Prayer, incantation
Kaumatua	Respected elder
Kōiwi / kōiwi	Human remains
Mahika kai/ Mahinga kai	Places where food is produced or procured
Mahika toi/ Mahinga toi	Places where non-food resources were gathered
Manawhenua	Those who exercise customary authority or rakātirataka
Papatipu	Original/traditional Māori land
Rakātira/Rangatira	Chief
Rakātirataka/Rangatiratanga	Chieftainship, decision-making rights
Rohe	Boundary
Rōpū	Group
Rūnaka/Rūnanga	Local representative group or community system of representation
Takata whenua/Tangata whenua	The iwi or hapū that holds mana whenua in a particular place
Takiwā	Area, region, district
Taoka/Taonga	Treasured object
Tapu	Sacred
Tikaka/Tikanga	Lore, customary values and practices
Tūpuna/Tīpuna	Ancestor
Umu	Earth oven
Umu-tī	Earth oven used for cooking cabbage tree (tī)
Urupā	Burial place
Wāhi Tapu	Places sacred to takata whenua
Whakapapa	Genealogy
Whānau	Family

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Table of Contents

Project Details i
Document Control i
Ownership and Disclaimer i
Executive Summary ii
Abbreviations ix
Glossary ix
Acknowledgements ix
Table of Contents xi
List of Figures xiv
List of Tables xix
1 Introduction 1
1.1 Project Area 1
1.2 Proposed Activities 3
2 Statutory Requirements 6
2.1 Heritage New Zealand Pouhere Taonga Act 2014 6
2.2 Conservation Act 1987 7
2.3 Reserves Act 1977 7
2.4 Resource Management Act 1991 8
2.5 Fast Track Approvals Act 2024 (FTA 2024) 9
2.6 Protected Objects Act 1975 10
3 Methodology 11
3.1 Historical Research 11
3.2 Survey Methodology 11
3.2.1 Aerial Imagery 11
3.2.2 LiDAR 11
3.2.3 Pedestrian Surveys 12
3.3 Assessment of Heritage Values 12
3.4 Assessment of Effects 15
4 Physical Environment and Setting 16
4.1 Geomorphology 16
4.2 Landscape Transformations 16
5 Historical Background 19
5.1 Māori Occupation in Central Otago 19
5.1.1 Pā and Kāika 20
5.1.2 Mahika Toi 21
5.1.3 Mahika Kai 23
5.1.4 Ara Tawhito and Nohoaka 23
5.2 Contact and Post-Contact Period Occupation in the Otago Region 24
5.2.1 Māori and Pākehā: Guides and Explorers 24
5.2.2 Runholders 25
5.2.3 Gold Miners 25
5.2.4 Water Race Technology 26
5.3 History of the Bendigo-Ophir Gold Project Area 27
5.3.1 Mahika Kai, Ara Tawhito, and Nohoaka 28
5.3.2 History of the Morven Hills Station (Sites G41/4 and G41/5) 28

5.3.3 History of The Rise and Shine (Sites G41/264, G41/265, G41/266, G41/267, G41/269, G41/273, G41/277, G41/584, G41/606, G41/658 and G41/783) 30
5.3.4 History of The Come-in-Time (Sites G41/251, G41/256, G41/586, G41/589, G41/604 and G41/605) 34
5.3.5 History of Shepherds Creek (Sites G41/6, G41/785, G41/786, G41/787, G41/788, G41/789, G41/790 and G41/792) 34
5.3.6 Matakanui-Bendigo Road (G41/782) 36
5.3.7 Thompsons Gorge Road Reserve 38
5.3.8 Late Twentieth Century Mining and Farming Activity in the Project Area 39
5.3.9 Summary 40
6 Previous Investigations and Heritage Context 41
6.1 Previous Research and Investigations within the Project Area 41
6.1.1 Bendigo Quartz Reefs Historic Area 43
6.1.2 Site G41/4 (Rabbiter's Hut) 45
6.1.3 Sie G41/5 (Stock Yards) 45
6.1.4 Site G41/6 (Water Race) 45
6.1.5 Site G41/251 (Come-in-Time Battery) 46
6.1.6 Site G41/256 (Gold workings) 48
6.1.7 Site G41/264 (Rise and Shine Gold Workings) 48
6.1.8 Site G41/265, G41/266 and G41/267 (Stone Huts) 50
6.1.9 Site G41/269 (Rise and Shine Dam) 54
6.1.10 Sites G41/273 and G41/606 (Stone Huts) 54
6.1.11 Site G41/277 (Rise and Shine Mine and Battery) 56
6.1.12 Site G41/584 (Rise and Shine Water Race) 58
6.1.13 Site G41/586 (Come-in-Time Water Race) 60
6.1.14 Site G41/589 (Revetted Road) 60
6.1.15 Site G41/604 (Battery and Turbine) 61
6.1.16 Site G41/605 (Mining Workings) 62
6.2 Bendigo Conservation Covenant 63
6.3 The Wider Archaeological and Heritage Context 64
6.4 Mining Sites in the Heritage Record 66
6.5 Historic-Domestic Sites in the Heritage Record 67
7 NZHP Site Surveys 69
7.1 November 2017 Survey 69
7.2 February 2018 Survey 72
7.3 December 2018 Survey 72
7.4 August and November 2021 Surveys 76
7.5 March and August 2022 Surveys 79
7.6 February 2023 Survey 80
7.7 April-May 2024 Survey 82
7.8 December 2024 Survey 82
7.9 March 2025 Survey 82
7.10 Results of the Site Surveys 85
7.10.1 Site G41/4 (Rabbiter's Hut) 86
7.10.2 Site G41/5 (Stock Yards) 87
7.10.3 Site G41/6 (Water Race) 88
7.10.4 Site G41/251 (Come-in-Time Battery) 88
7.10.5 Site G41/256 (Gold Workings) 93
7.10.6 Site G41/264 (Rise and Shine Workings) 95
7.10.7 Sites G41/265, G41/266 and G41/267 (Stone Huts) 97

7.10.8 Site G41/269 (Rise and Shine Dam) 100
7.10.9 Sites G41/273 and G41/606 (Stone Huts) 102
7.10.10 Site G41/277 (Rise and Shine Mine and Battery) 103
7.10.11 Site G41/584 (Rise and Shine Water Race) 105
7.10.12 Site G41/586 (Come-in-Time Water Races) 108
7.10.13 Site G41/589 (Revetted Road) 110
7.10.14 Site G41/604 (Battery and Turbine) 112
7.10.15 Site G41/605 (Mining Workings) 113
7.10.16 Site G41/658 (Hut Terrace) 115
7.10.17 Site G41/678 (Stone Chimney) 117
7.10.18 Site G41/782 (Matakanui-Bendigo Road) 118
7.10.19 Site G41/783 (Track) 127
7.10.20 Site G41/784 (Hut Sites) 128
7.10.21 Site G41/785 (Hut Site) 130
7.10.22 Site G41/786 (Hut Site) 131
7.10.23 Site G41/787 (Tailings) 133
7.10.24 Site G41/788 (Tailings) 134
7.10.25 Site G41/789 (Sluicing) 135
7.10.26 Sites G41/790 and G41/792 (Water Races) 137
7.10.27 POI 3, 5, 46 and 47 (Potential Water Races) 141

8 Research Results 143

8.1 Constraints and Limitations 144

9 Heritage and Archaeological Values 145

9.1 Values of McLean's Pre-Emptive Rights Site Complex 145
9.1.1 Archaeological Values of Site G41/4 (Rabbiter's Hut) 146
9.1.2 Archaeological Values of Site G41/5 (Stockyards) 146
9.2 Values of the Rise and Shine Workings 147
9.2.1 Archaeological Values of Site G41/264 (Rise and Shine Gold Workings) 148
9.2.2 Archaeological Values of Sites G41/265, G41/266 and G41/267 (Stone Huts) 148
9.2.3 Archaeological Values of Site G41/269 (Rise and Shine Dam) 149
9.2.4 Archaeological Values of Sites G41/273 and G41/606 (Stone Huts) 149
9.2.5 Archaeological Values of Site G41/277 (Rise and Shine Mine and Battery) 150
9.2.6 Archaeological Values of Site G41/584 (Rise and Shine Water Race) 151
9.2.7 Archaeological Values of Site G41/658 (Hut Terrace) 151
9.2.8 Archaeological Values of Site G41/783 (Track) 152
9.3 Values of The Come-in-Time Area 152
9.3.1 Archaeological Values of Site G41/251 (Come-in-Time Battery) 153
9.3.2 Archaeological Values of Site G41/256 (Gold Workings) 154
9.3.3 Archaeological Values of Site G41/586 (Come-in-Time Water Race) 154
9.3.4 Archaeological Values of Site G41/589 (Revetted Road) 155
9.3.5 Archaeological Values of Site G41/604 (Battery and Turbine) 155
9.3.6 Archaeological Values of Site G41/605 (Mining Workings) 156
9.4 Values of the Shepherds Creek Area 156
9.4.1 Archaeological Values of Site G41/6 (Water Race) 157
9.4.2 Archaeological Values of Site G41/678 (Stone Hut) 157
9.4.3 Archaeological Values of Sites G41/784, G41/785 and G41/786 (Hut Sites) 158
9.4.4 Archaeological Values of Site G41/787 and G41/788 (Tailings) 158
9.4.5 Archaeological Values of Site G41/789 (Sluicing) 159
9.4.6 Archaeological Values of Site G41/790 and G41/792 (Water Races) 159
9.5 Values of the Matakanui-Bendigo Road (Site G41/782) 160

9.6 Archaeological Values of Potential Unrecorded Sites 160
9.7 Summary of Heritage Values of the Project Area 163
10 Assessment of Effects on Archaeological and Heritage Values 165
10.1 Effects to Archaeological Values 165
10.2 Effects to Heritage Values 166
10.3 Recommendations to Avoid, Minimise and/or Mitigate Adverse Effects 167
10.3.1 Consideration of Less Adverse Options 167
10.3.2 Sites and Features to be Avoided or Protected 168
10.3.3 Mitigation for Information Loss 169
10.3.4 Investment in Other Heritage Sites 170
10.3.5 Post-Investigation Analysis, Interpretation and Reporting 171
10.4 Summary of Effects on Heritage Values 171
11 Conclusions and Recommendations 172
12 References 176
Appendix A Land Parcels in the Project Area A-1
Appendix B Site Record Forms B-1

List of Figures

Figure 1-1. Location of the project area. 2
Figure 1-2. Overview Layout of the Bendigo-Ophir Gold Project (Mitchell Daysh). 3
Figure 4-1. The broader geographical setting of the project area. 17
Figure 4-2. Schist outcrops within the project area (NZHP 2018). 18
Figure 5-1 Traditional routeways and settlements compiled by Anderson (1982: Figure 2), with approximate location of project area shown by red arrow. 20
Figure 5-2. Detail of Beattie's map with multiple Māori place names in vicinity of project area (approximate location indicated by red box) (Beattie, 2011). 22
Figure 5-3. Distribution of pounamu (nephrite and bowenite) in the South Island (Beck & Mason, 2002). 23
Figure 5-4. Detail of Mantell's 1848 map showing ara tawhito (dotted line) in approximate location of the project area (red arrow) (Mantell, 1848). 24
Figure 5-5 A view of Gabriels Gully in 1862, showing a pitted landscape with various mound and pothole features (Gore, 1862). Also note the frequency of tent sites. 26
Figure 5-6. Detail of SO 16291 with relevant part of project area overlaid (red), showing area of John Mclean's pre-emptive right and associated structures. Note: Shepherds Creek is labelled as Ardgour Creek in this plan. 29
Figure 5-7. Miners and mine huts at the Bendigo Rise and Shine Mine in 1933 ('Quartz Mining in Otago - Unemployed Strike it Rich' New Zealand Free Lance, 28 March 1934 in Carpenter, 2013b: Figure 7). 32
Figure 5-8. Miners' huts and manager's house at the Bendigo Rise and Shine Mine in 1933 ('Quartz Mining in Otago - Unemployed Strike it Rich' New Zealand Free Lance, 28 March 1934 in Carpenter, 2013b: Figure 8). 32
Figure 5-9 Plan of mining history in the Rise and Shine valley showing the various water races, batteries, and mines and their varying owners in the nineteenth and early twentieth centuries (Carpenter, 2013b: Figure 9). 33
Figure 5-10. Detail of 1897 map showing Shepherds Creek (H.T.W., 1897). 36
Figure 5-11. Detail of 1907 geological plan showing location of old workings (red circles) along Shepherds Creek (R. J. Crawford, 1907). The proposed project area is shown in red. 36

Figure 5-12. Detail of SO 12016 (1898) shown the first survey of the Matakanui-Bendigo Road along Shepherds and Jean Creek. The proposed project area has been overlaid in red. 37
Figure 5-13. Aerial photograph from 1958 showing the Matakanui- Bendigo Road (Retrolens, 2021). Note that following the main stone revetment (red arrow) the wide road is no longer visible. 38
Figure 5-14. Survey plan SO 1204 (1909) showing likely pre-1900 tracks (dotted brown line). The proposed project area is overlaid in red. 39
Figure 5-15. Survey plan SO 2086 (1876) showing likely track to Thomsons Creek (dotted brown line). 39
Figure 5-16. Recorded exploration sites throughout the Bendigo-Ophir Project Area Minerals Exploration Permit 60311 (outlined green) as of 2019, classified by exploration method: hand (open black circles) and mechanical (other colours) (Source: Kim Bunting, Matakanui Gold Ltd.). the current project area is located close to the purple circles. 40
Figure 6-1. Distribution of recorded heritage sites within the BOGP project area and the wider landscape. 42
Figure 6-2. Extent of Bendigo Quartz Reefs Historic Area outlined in red, with total BOGP project area shown in green. 44
Figure 6-3. Sketch map of G41/4 (bottom centre) in context with G41/5 stock yards (Hamel, 1993). 45
Figure 6-4 Plan of the Come-in-Time battery developed from Jacomb and Easdale's 1980 survey (Hamel, 1993: Figure 21). 46
Figure 6-5. Site G41/251 in 2005, looking east with stamper battery at bottom left and adit at top of image (Nichol & Wright, 2006). 47
Figure 6-6. Restoration of the stone walls adjacent to the Come-in-Time battery (Middlemiss, 2011). 47
Figure 6-7. Sketch map of western half of G41/264 and G41/269 (labelled "reservoir") created following 1990 survey (Hamel, 1993). 49
Figure 6-8. Sketch plan of eastern half of G41/264 and associated sites created following 1993 survey (Hamel, 1993) and updated with site numbers in 2005. 50
Figure 6-9. Sketch map of G41/265 from 1980 site record form. 51
Figure 6-10. Sketch plan of G41/266 from 1980 site record form. 51
Figure 6-11. Sketch plan of G41/267 from 1980 site record form. 52
Figure 6-12. Photograph of hut G41/267 taken in 1990, showing the structure beginning to be enveloped in matagouri scrub (Hamel, 1993). 52
Figure 6-13. Site G41/265 looking east in 2005 (Nichol & Wright, 2006). 53
Figure 6-14. Rear wall of site G41/266 in 2005 (Nichol & Wright, 2006). 53
Figure 6-15. Sketch plan of G41/269 from 1980 site record form. 54
Figure 6-16. Site G41/269 in 2005, looking southeast (Nichol & Wright, 2006). 54
Figure 6-17. Sketch map of G41/273 from 1980 SRF. 55
Figure 6-18. Looking west at site G41/273 (stones just visible in centre of image) (Nichol & Wright, 2006). 55
Figure 6-19. Sketch maps of G41/277 drawn in 1990 (Hamel, 1993). 56
Figure 6-20. Sketch map of G41/277 drawn in 1990 (Hamel, 1993). 57
Figure 6-21. Concrete machine foundation at site G41/277 in 2005 (Nichol & Wright, 2006). 57
Figure 6-22. Looking east over G41/277 in 2005, with water race G41/586 visible at top left (Nichol & Wright, 2006). 58
Figure 6-23. Section of G41/584 in 2005, with notebook in ditch and backpack on bank (Nichol & Wright, 2006). 59
Figure 6-24. View of G41/584 on far side of valley in 2005 (Nichol & Wright, 2006). 59
Figure 6-25. Site G41/584, close to Thompsons Saddle (Carpenter, 2012). 60
Figure 6-26. Site G41/589 in 2005 (Nichol & Wright, 2006). 61
Figure 6-27. Sketch map of G41/604 from Hamel (1993). 62
Figure 6-28. Potential turbine remains at site G41/604 in 2005 (Nichol & Wright, 2006). 62
Figure 6-29. Looking north over site G41/605 in 2005 (Nichol & Wright, 2006). 63

Figure 7-1. Map showing the location of previous archaeological surveys undertaken between 2018 and 2025 71
Figure 7-2. Plan showing area covered by the 2018 pedestrian survey. 74
Figure 7-3. Plan showing the location of the August and November 2021 Surveys 77
Figure 7-4. Map showing areas survey within the RAS area (shaded green). Further drilling is proposed throughout the RAS target area (green) with the initial 17 shown in red and the next 8 drill sites shown in orange. Locations may vary depending on results of testing. 78
Figure 7-5. Proposed drills sites and survey area for August and November 2021 surveys. 79
Figure 7-6. Map showing recorded archaeological sites and POI identified during desktop research in relation to the area appraised and surveyed in March 2022. 80
Figure 7-7. Map showing area appraised in February 2023, with survey areas and recorded archaeological sites 81
Figure 7-8. Plan showing the April - May 2024 archaeological survey area with POI labelled. 83
Figure 7-9. Plan showing area covered by December 2024 survey and identified sites 84
Figure 7-10. 1958 aerial (left and centre) and LiDAR imagery (right) showing identified and potential heritage sites from December 2024 survey. 84
Figure 7-11. Area covered during March 2025 survey with potential heritage features identified from LiDAR and historic aerials labelled. Note this survey also included a traverse of the proposed bore field and pipeline alignment along Matilda Rise (not shown here) 85
Figure 7-12. Location of Site G41/4 (Project area is shown in red) 86
Figure 7-13. Site G41/4 in 2024, looking east. 87
Figure 7-14. Site G41/4 in 2024, looking north. 87
Figure 7-15. Location of Site G41/5 (Project area is shown in red) 88
Figure 7-17. Looking southeast at Site G41/5, March 2025. 89
Figure 7-18. Details of stone walls at site G41/5, March 2025. 89
Figure 7-19. Location of Site G41/6 (Project area is shown in red) 90
Figure 7-20. Photograph showing the G41/6 water race, looking east towards the project area. 90
Figure 7-21. Location of G41/251. Project area is shown in red. 91
Figure 7-22 Photograph looking southeast at the Come-in-Time battery recorded as G41/251. Phoebe Scrivener is shown in front of the battery. 91
Figure 7-23 Photograph looking southwest at the schist channelling at the end of the Come-in-Time water race recorded as part of G41/251 92
Figure 7-24 Photograph looking north at the main adit of the Red Mine recorded as part of G41/251 92
Figure 7-25 Photograph looking north at the partially collapsed stone revetment recorded as part of G41/251 93
Figure 7-26. Location of site G41/256 with project area shown in red. 94
Figure 7-27. Photograph showing the tailing mound, looking southeast (NZHP, 2024). 94
Figure 7-28. Photograph showing the tailing mound, looking northwest with the farmers track in the background (NZHP, 2024). 95
Figure 7-29. Photograph of the possible sluice face, looking west (NZHP, 2024). 95
Figure 7-30. Location of G41/264. Project area is shown in red. 96
Figure 7-31 Photograph looking southeast at the tailings recorded as part of G41/264. 97
Figure 7-32 1958 Aerial photograph (left) and LiDAR imagery (right) showing gold mining workings recorded as G41/264 (red circle). 97
Figure 7-33. Looking south towards sites G41/266 and G41/267, with their approximate locations indicated by the red arrows. 98
Figure 7-34. Location of G41/265. Project area is shown in red. 98
Figure 7-35. Site G41/265 looking northwest. Note modern fence in foreground. 99
Figure 7-36. Detail of 1958 aerial showing hut G41/265 (outlined in red). Right: LiDAR imagery with hut G41/265 now cut by modern fence line. 99
Figure 7-37. Location of G41/266 (left) and G41/267 (right). Project area is shown in red. 100

Figure 7-38. 1958 Aerial photograph (left) and LiDAR imagery (right) showing anomalies in location of hut G41/266 (red arrow) and G41/267 (yellow arrow) 100
Figure 7-39. Looking south at G41/269, November 2017. 100
Figure 7-40. Photograph looking south at the stone revetted bank of the dam recorded as G41/269, taken December 2018. 101
Figure 7-41. Location of G41/269. Project area is shown in red. 101
Figure 7-42. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of the dam (G41/269) circled red. 102
Figure 7-43. Location of G41/273 (left) and G41/606 (right). Project area is shown in red. 102
Figure 7-44. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of site G41/273 (circled red) and site G41/606 (circled yellow). The red arrow indicates a more intact hut site (G41/272) that sits outside the project area. 102
Figure 7-45 Photographs looking southwest at mine recorded as G41/277. Photographs show concrete machine foundations, adit, stone faced dam and sluice face. 103
Figure 7-46 Photographs looking northwest (left) and north (right) of revetted tramway recorded as part of G41/277 103
Figure 7-47. Recorded extent of site G41/277. Project area is shown in red. 104
Figure 7-48. LiDAR imagery (left) 1958 Aerial photograph (right) and showing road along the Rise and shine creek associated with G41/277 104
Figure 7-49. 1958 aerial photograph (left) and LiDAR imagery showing possible gold workings (red arrows: POI 331-334) along the northeast and southwest side of the Rise and Shine Valley. 105
Figure 7-50. 1958 aerial photograph (left) and LiDAR imagery (right) showing possible tailing (blue arrows: POI 325 and 326) areas, and other possible gold workings (red arrows: POI 331-334) along the northeast and southwest side of the Rise and Shine Valley. 105
Figure 7-51 Photograph showing tailings on the slope above the Rise and Shine Creek. 106
Figure 7-52. Location of G41/584. Project area is shown in red. 106
Figure 7-53 Photograph looking southeast (left) and northwest (right) at the upper extent of the water race recorded as G41/584. 107
Figure 7-54. LiDAR image showing the end of the G41/584. At the top of the image the race travels around Mt Moka. The arrow shows the race dropping towards the Rise and Shine Creek. 107
Figure 7-55. Rise and Shine water race (G41/584) within the project area, looking southeast, February 2018. 108
Figure 7-56. LiDAR image showing the part of the lower extent of G41/584 running through modern root rake areas (red arrow). 108
Figure 7-57. Location of G41/586. Project area is shown in red. 109
Figure 7-58. Photograph looking south at the Come-in-Time water race where it passes through G41/604, February 2018. 109
Figure 7-59. 1958 aerial photograph (left) and LiDAR imagery (right) showing the race recorded as G41/586. The split at Thomson Gorge Road is shown with the red arrow. 110
Figure 7-60 Left: photograph looking north at the Come-in-Time water race. Right: photograph looking northeast at the water race. Both photographs taken December 2018. 110
Figure 7-61. Location of G41/589. Project area is shown in red. 111
Figure 7-62. Photograph looking northeast at the revetted road recorded as G41/589 (red arrow). 111
Figure 7-63. 1958 aerial photograph and LiDAR imagery showing the revetted road recorded as G41/589 (red arrow) 112
Figure 7-64. Location of G41/604. Project area is shown in red. 112
Figure 7-65. Stacked stone chimney or forge remains with metal artefacts on top (G41/604), photographed February 2018. 113
Figure 7-66. Looking southeast towards site G41/604, February 2018. 113
Figure 7-67. Location of G41/605. Project area is shown in red. 114

Figure 7-68. 1958 aerial photograph (left) and LiDAR imagery (right) showing G41/604 (blue) and G41/605 (red). 114
Figure 7-69. Looking southeast at G41/605, towards Thompsons Gorge Road (at top of ridge), showing motorcycle tracks, November 2017. 115
Figure 7-70. Location of G41/658. Project area is shown in red. 116
Figure 7-71. G41/658 hut terrace, looking north. 116
Figure 7-73. Photograph looking southeast at chimney recorded as G41/678, December 2018. 117
Figure 7-74. Photograph looking northwest at chimney recorded as G41/678. Megan Lawrence is shown in the background of the chimney. 117
Figure 7-75. Photograph looking southwest at chimney recorded as G41/678. 118
Figure 7-76. Site G41/678 extent with project area shaded red. 118
Figure 7-77. Location of G41/782. Project area is shown in red. 119
Figure 7-78. Photograph looking northwest at main vehicle track currently used. 120
Figure 7-79. LiDAR imagery with land parcel boundaries shown in black. The Matakanui-Bendigo Road as surveyed is shown along with associated features. At the southeast end, the currently used road veers off to the northeast; however, a smaller narrower track continues to follow the surveyed alignment (shown in purple). Features along the track include culverts in blue, historic drill site in yellow, and stone revetments in orange. 121
Figure 7-80. Photograph looking east at collapsed stacked schist culvert (POI 146), December 2018. 121
Figure 7-81 Photograph looking south at stacked schist revetment (POI 241-243). 122
Figure 7-82. Photographs of culvert and revetment (POI 800) looking southeast at intact east end (top left), east at collapsed west end (top right), south at culvert (bottom left), and north at inlet (bottom right). Photographs taken August 2021. 122
Figure 7-83. Photographs of culvert and revetment (POI 803) looking east (top left), north (top right), south at culvert (bottom left and right). Photographs taken August 2021. 123
Figure 7-84. Photograph looking south at culvert inlet (POI 808), August 2021. 124
Figure 7-85. Photographs of stacked schist revetment (POI 810) looking southeast and southwest at the northwest end of the wall. 124
Figure 7-86. Photographs of stacked schist revetment (POI 810) southeast along the extent of the wall (left) and north (right) at the southeast end of the wall. 124
Figure 7-87. Photograph looking west at full extent of the stacked schist revetment (POI 810). 125
Figure 7-88. Photograph looking north at drill point on south (upper) side of the road. 125
Figure 7-8984. Photograph looking southeast at the narrow track following the 1898 proposed road alignment. 126
Figure 7-91. Photograph looking southeast at the narrow track following the 1898 proposed road alignment continuing over the next spur beyond the proposed works area. 127
Figure 7-92. Location of G41/783. Project area is shown in red. 127
Figure 7-93. Photograph looking west at possible pre-1900 track (red arrows). 128
Figure 7-94. 1958 aerial photograph (left) and LiDAR imagery (right) showing possible track in the valley north of Clearwater Creek valley. 128
Figure 7-95. Location of site G41/784. Project area is shown in red. 129
Figure 7-96 Photograph looking southeast at raised platform and schist areas. Phoebe Scrivener stands on the south-eastern most raised platform. 129
Figure 7-97 Photograph looking south at raised platform and schist area. 130
Figure 7-98. Location of G41/785. Project area is shown in red. 131
Figure 7-99. Photographs showing mound alongside Shepherds Creek (POI 815), November 2021. 131
Figure 7-100. Location of G41/786. Project area is shown in red. 132
Figure 7-101. G41.786 looking south, August 2022. 132
Figure 7-102. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of G41/786 circled red. 133
Figure 7-103. Location of G41/787. Project area is shown in red. 133

Figure 7-104 Photograph looking west at possible tailings. 134
Figure 7-105. Location of G41/788. Project area is shown in red. 134
Figure 7-106. Looking southwest at site G41/788, August 2022. 135
Figure 7-107. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of the POI 844 circled red. 135
Figure 7-108. Location of G41/789. Project area is shown in red. 136
Figure 7-109. G41/789 looking east, August 2022. 136
Figure 7-110. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of G41/789 circled red. All other linear features were determined to be natural or stack tracks during the pedestrian survey. 137
Figure 7-111. Location of G41/790. Project area is shown in red. 137
Figure 7-112. Photographs of the water race, left photograph facing west, and right photograph facing east towards the project area. 138
Figure 7-113. 1958 aerial (left and centre) and LiDAR imagery of project area with water race shown in left image. 138
Figure 7-114. Photograph of the water race looking south, September 2025. 139
Figure 7-115. Looking north along water race, September 2025. 139
Figure 7-116. Map showing extent of recorded water race G41/792 with relevant portion of project area outlined in red and areas of known modern disturbance shown. 140
Figure 7-117. 1958 aerial (left and centre) and 2018 LiDAR imagery with POI 3, 5, 46 and 47 labelled. 141
Figure 7-118. Looking south from northern tip of project area towards location of POI 46. 141
Figure 7-119. Facing northwest at location of potential fork of POI 47. 142

List of Tables

Table 1-1. Summary of project area. 1
Table 3-1. Criteria for the assessment of heritage values as defined in HNZPT's *Significance Assessment Guidelines* (Heritage New Zealand Pouhere Taonga, 2019). 12
Table 3-2. Levels of overall heritage value for individual sites (adapted from DoT, 2008). 14
Table 3-3. Levels of overall heritage value for site complexes and landscapes. 15
Table 5-1. Summary of land transactions and key events records for the project area. 27
Table 6-1. Previously recorded sites throughout the project area. 43
Table 6-2. Previously recorded archaeological sites within 1km of the project area. 64
Table 7-1. Table showing previously recorded sites relocated during the November 2017 survey. 69
Table 7-2. Summary of November 2017 survey results. 69
Table 7-3. Table showing previously recorded and new sites visited during the February 2018 survey. 72
Table 7-4. Summary of results of February 2018 pedestrian survey. 72
Table 7-5. Table showing previously recorded sites relocated, previously recorded sites not relocated and new sites recorded throughout the survey area during the December 2018 survey. 75
Table 7-6. Table showing previously recorded and new sites visited during the August and November 2021 surveys. 78
Table 7-7. Brief summary table of drill sites and the Matakanui-Bendigo Road. 78
Table 7-8. Table showing sites visited during the August and November 2021 surveys. 80
Table 7-9. Table showing previously recorded sites revisited during the February 2023 survey. 82
Table 7-10. Table showing previously recorded sites revisited during the April-May 2024 survey. Sites shaded grey extend into the current project area. 82
Table 7-11. Table showing previously recorded sites revisited during the December 2024 survey. 82
Table 7-12. Previously recorded sites within the project area. 85
Table 7-13. New heritage sites identified within the project area. 86
Table 7-14. Features associated with the Matakanui-Bendigo Road (G41/782) identified within the current project area. 120

Table 9-1. Summary of assessment of heritage values for site G41/4. 146
Table 9-2. Summary of archaeological values for site G41/4. 146
Table 9-3. Summary of assessment of heritage values for site G41/5. 146
Table 9-4. Summary of assessment of heritage values for Rise and Shine workings. 147
Table 9-5. Summary of assessment of archaeological values for site G41/264. 148
Table 9-6. Summary of assessment of archaeological values for site G41/265, G41/266 and G41/267. 148
Table 9-7. Summary of assessment of archaeological values for site G41/269. 149
Table 9-8. Summary of assessment of archaeological values for sites G41/273 and G41/606. 150
Table 9-9. Summary of assessment of archaeological values of site G41/277. 150
Table 9-10. Summary of assessment of archaeological values for site G41/584. 151
Table 9-11. Summary of assessment of archaeological values for site G41/658. 151
Table 9-12. Summary of assessment of archaeological values for site G41/783. 152
Table 9-13. Summary of assessment of heritage values of the Come-in-Time workings. 153
Table 9-14. Summary of assessment of archaeological values for site G41/251. 153
Table 9-15. Summary of assessment of heritage values for site G41/256. 154
Table 9-16. Summary of assessment of heritage values for site G41/586. 154
Table 9-17. Summary of assessment of heritage values for site G41/589. 155
Table 9-18. Summary of assessment of heritage values for site G41/604. 155
Table 9-19. Summary of assessment of heritage values for site G41/605. 156
Table 9-20. Summary of assessment of heritage values for Shepherds Creek. 156
Table 9-21. Summary of assessment of archaeological values for site G41/6. 157
Table 9-22. Summary of archaeological value for site G41/678. 158
Table 9-23. Summary of assessment of archaeological values for sites G41/784, G41/785 and G41/786. 158
Table 9-24. Summary of assessment of archaeological values for site G41/787 and G41/788. 159
Table 9-25. Summary of assessment of archaeological values for site G41/789. 159
Table 9-26. Summary of assessment of archaeological values for sites G41/790 and G41/792. 160
Table 9-27. Summary of assessment of archaeological values of site G41/782. 160
Table 9-28. Summary of assessment of archaeological values for unrecorded mining sites. 161
Table 9-29. Summary of archaeological values for unrecorded historic-domestic sites. 161
Table 9-30. Summary of archaeological values for unrecorded transport-communication sites. 162
Table 9-31. Summary of assessment of archaeological values for unrecorded pastoral sites. 162
Table 9-32. Summary of heritage values for potential Māori sites. 163
Table 9-33. Summary of heritage values of Bendigo Ophir Gold Project Area. 164
Table 10-1. Summary of effects on archaeological sites within the Bendigo-Ophir project area. Sites are colour coded to show their association to the site complexes identified by NZHP, with Mclean's pre-emptive rights area in orange, Rise and Shine in blue, Come-in-Time in green, and Shepherds Creek in grey. 165
Table 11-1. Summary of effects on heritage sites within the proposed Bendigo-Ophir Gold Project area. Sites are colour coded to show their association to the site complexes identified by NZHP, with Mclean's pre-emptive rights area in orange, Rise and Shine in blue, Come-in-Time in green, and Shepherds Creek in grey. 175

1 Introduction

Matakanui Gold Ltd (MGL) are proposing to undertake gold mining activities in the Rise and Shine Valley, Central Otago. New Zealand Heritage Properties Ltd (NZHP) has been commissioned by Mary Askey on behalf of MGL to undertake a heritage assessment of the Bendigo-Ophir Gold Project (BOGP) area. This heritage assessment has been prepared to assess the heritage potential of the project area and to consider the impact that the proposed works will have on any sites. The Conservation Act 1987 protects heritage of all periods. The Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA 2014) affords protection to archaeological sites, which are areas that witnessed human occupation prior to the year 1900 and can provide information on the history of New Zealand through archaeological investigation.

1.1 Project Area

The project area (Figure 1-1) encompasses parts of 21 private land parcels and ten road reserve parcels (see 12Appendix A for a full list), and a summary of the project area is provided in Table 1-1. The project area includes 19 previously recorded heritage sites and 12 new sites recorded as part of this project. Part of Section 12 SO 24641, described as "a polygon drawn around the recorded sites (G41/276, G41/268 and G41/267) on the southwest boundary, and follows the road on the northeast boundary", is included in the Bendigo Quartz Reefs Historic Area (List No. 9097 on the New Zealand Heritage List Rārangi Kōrero). Multiple land parcels (Sections 11, 12, 16 and 18 SO 24641, and Lot 4 DP 525495) are included in the Bendigo Station Conservation Covenant Area, which includes restrictions on activities that may affect the natural or historic resources on the property, at the discretion of the Minister of Conservation. Section 1 SO 24604 is part of a conservation reserve, and the project area sits within an area of Outstanding Natural Landscape scheduled on the Central Otago District Council (CODC) District Plan. There are no statutory acknowledgement areas within the project area.

Table 1-1. Summary of project area.

Legal Description and Landowners	See Appendix A for list of affected land parcels and landowners/leaseholders
Territorial Authority	Central Otago District Council
Archaeological Site No.	G41/4, G41/5, G41/6, G41/251, G41/256, G41/264, G41/265, G41/266, G41/267, G41/269, G41/272, G41/273, G41/277, G41/584, G41/586, G41/589, G41/604, G41/605, G41/606, G41/658, G41/678, G41/782, G41/783, G41/784, G41/785, G41/786, G41/787, G41/788, G41/789, G41/790, G41/792
Previous Archaeological Authorities	-
New Zealand Heritage List/Rārangi Kōrero	Bendigo Quartz Reef Historic Area (List ID 9097)
Covenant or Heritage Order	Bendigo Station Conservation Covenant
Scheduled on District Plan	Outstanding Natural Landscape (Elevated Areas, Bendigo)
Reserve Status	Road reserve, Conservation Reserve (Section 1 SO 24604), Historic Reserve (Section 1 SO 401685)
Statutory Acknowledgement Area	-
Customary Marine Title	-

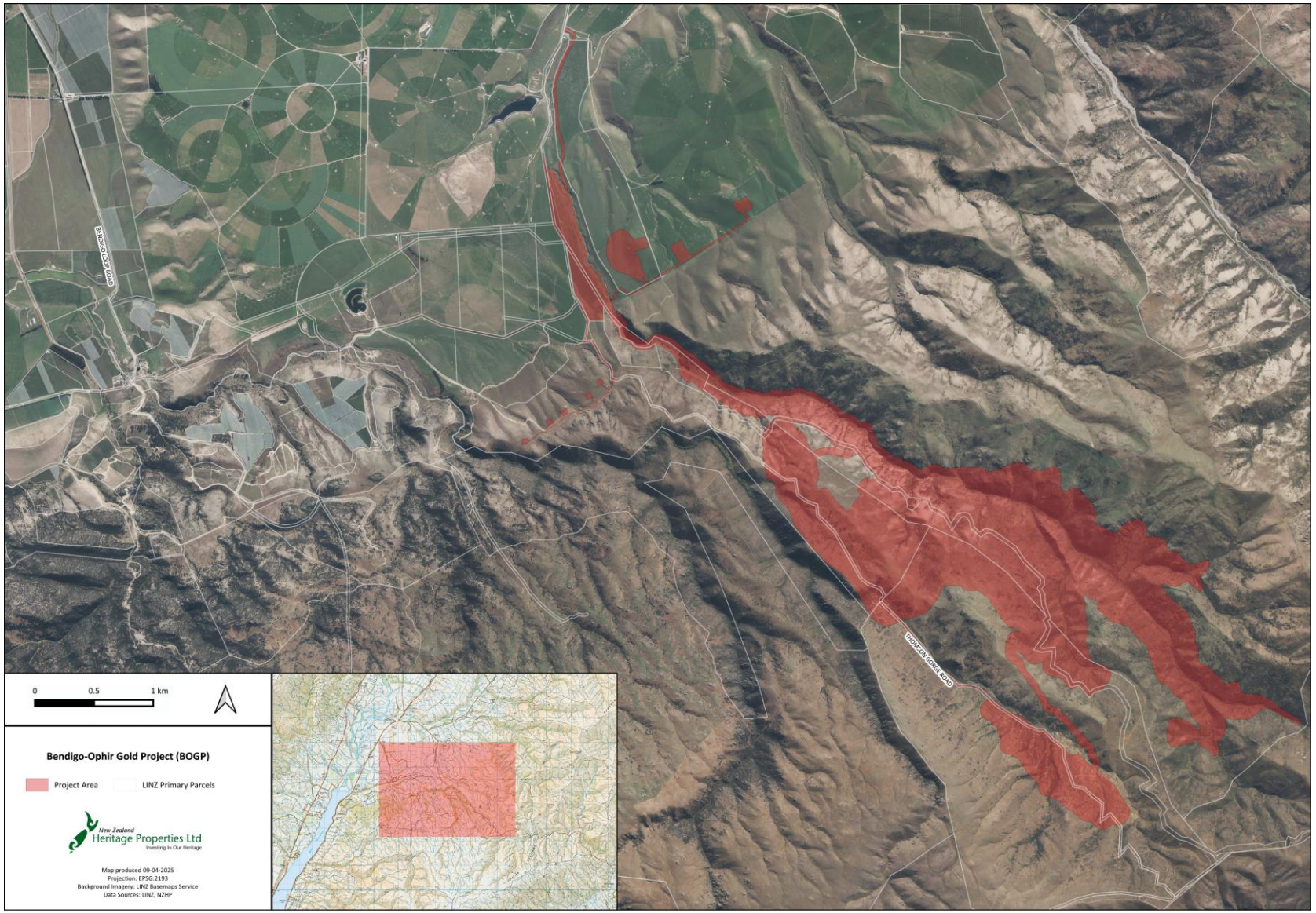


Figure 1-1. Location of the project area.

1.2 Proposed Activities

Matakanui Gold Limited (**MGL**) is proposing to establish within the Bendigo-Ophir Gold Project (**BOGP**), a new gold mine, ancillary facilities and environmental mitigation measures on Bendigo and Ardgour Stations in the Dunstan Mountains of Central Otago. The project site is located approximately 20 km north of Cromwell.

The BOGP is located within the footprint of Minerals Exploration Permit 60311, which overlays several pastoral stations that have grazed sheep and cattle in the area for over 100 years. MEP60311 is held by MGL under the Crown Minerals Act 1991. MGL has land access agreements with Bendigo and Ardgour Stations. The BOGP is located adjacent to land administered by the Department of Conservation (**DOC**), including the Bendigo Historic Reserve, the Bendigo Conservation Area and the Ardgour Conservation Area. The BOGP planned operations do not directly impact these areas.

The BOGP's exploration has discovered numerous soil geochemical anomalies and extensive drill evaluation has defined four (4) gold deposits worthy of economic extraction. The most significant is the Rise and Shine (**RAS**) discovery which is the most significant gold discovery in New Zealand in the past 4 decades. The other discoveries at Come in Time (**CIT**), Srex (**SRX**) and Srex East (**SRE**) are smaller in size and tenor.

The defined orebodies are planned to be mined by open pit methods. Underground mining is planned for the deeper parts of the RAS orebody in the later years of development.

The majority of the mining activities, ancillary facilities and associated infrastructure will be located in the Shepherds Valley somewhat hidden from the view of the public. Access, and service and administration offices are planned to be located on the adjoining Ardgour Terrace.

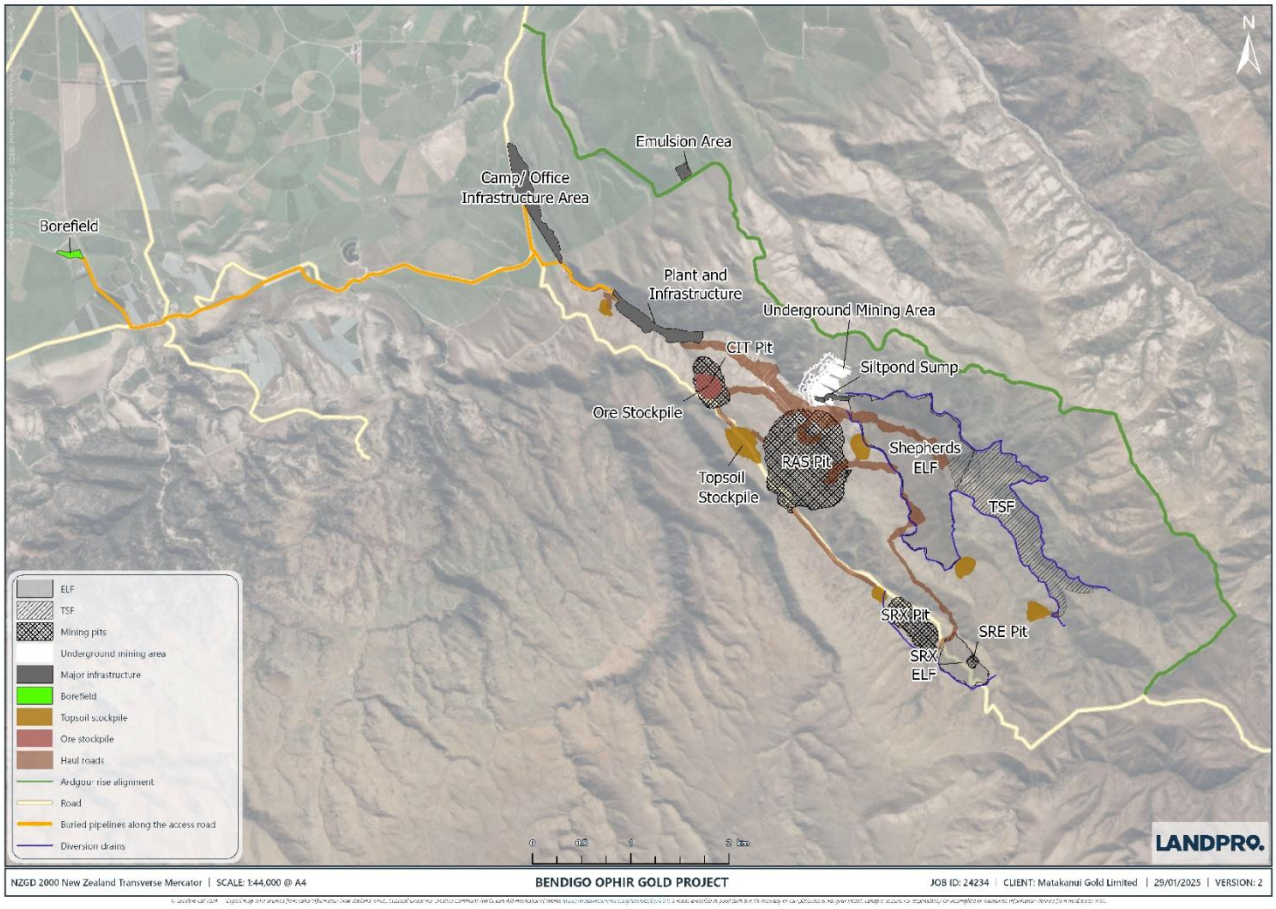


Figure 1-2. Overview Layout of the Bendigo-Ophir Gold Project (Mitchell Daysh).

Figure 1 above provides an overview of the footprint associated with the establishment, operation and rehabilitation within the BOGP. Direct disturbance in the pastoral area will be approximately 380 hectares. A disturbance contingency has been allowed around the mine and infrastructure for footprint adjustments during detailed design. A further 18ha (approximately) of disturbance will be needed to establish the Thomson Gorge Road alternative alignment (Ardgour Rise). Maximum potential disturbance in the pastoral area, including contingency and Ardgour Rise, is 568ha.

Additional disturbance of approximately 52ha will be required in the agricultural area on Ardgour Terrace. This area will be used for offices, security, medical, laboratory, laydown, storage, contractor areas, topsoil storage, emulsion manufacture and magazine facilities plus quarries and roading.

Ecological work will include rehabilitation on direct disturbed areas, ecological uplift activities and pest exclusion area(s) adjacent to the footprint on nearby areas such as Ardgour and Bendigo Stations. A full description of the various activities comprising the establishment, operation and rehabilitation within the BOGP is provided in the Assessment of Environmental Effects prepared by Mitchell Daysh Limited. However, by way of summary, the BOGP includes the following components:

- The establishment of the RAS Open Pit and SRX Open Pit, which are planned to form partial pit lakes at closure;
- The establishment of RAS Underground which is planned to be backfilled with cement paste;
- The establishment of the CIT Open Pit, which is the smallest of footprints and is planned to be progressively backfilled with waste rock from the RAS Open Pit and profiled to integrate with the surrounding terrain. Rehabilitation will enable nearby native herb fields to be re-established at the completion of mining activities;
- The establishment of the small SRE Open Pit, which will be backfilled with waste rock before being covered with overburden to form the engineered landform for the adjoining SRX Open Pit ("**SRX ELF**").
- A conventional hard rock gold processing plant (1.2 million tonnes per annum expandable to 1.8Mtpa) applying modern Carbon-in-Leach ("CIL") technology constructed in the lower reach of Shepherds Valley. The plant will operate in a closed water circuit with the TSF. Residual chemicals in the tailings slurry will be detoxified and/or precipitated with specialist plant.
- The operation of the process plant will be supported by ancillary facilities such as maintenance workshops, raw material and process chemical storage, fuel depot, laboratory and warehousing. Mine offices, carparking and security services will also be established.
- The construction of the plant in the lower reaches of the Shepherds valley will include the realignment of Shepherds Creek;
- The establishment of water storage dams and tankage for use in the process plant, dust suppression and drinking water supply;
- The establishment of a Tailings Storage Facility (**TSF**) in the upper reach of Shepherds Valley (including clean water diversion drains), which will utilise waste rock from mining activities within the project site;
- The establishment of permanent engineered landforms in the Shepherds Valley (**Shepherds ELF**) and an unnamed creek west of RAS pit (**WELF**);
- The establishment of temporary topsoil, vegetation and brown rock stockpiles around the project site;
- The extraction of groundwater from the Bendigo Aquifer for use in mining-related activities as well as supplying BOGP drinking water and replacing small irrigation water takes from Shepherds Creek. Bore water will be pumped to the processing plant via a pipeline over a distance of approximately 7 km.
- The establishment of supporting infrastructure / activities for the project, such as the upgrade of Ardgour Road and parts of Thomson Gorge Road to provide improved access to the BOGP, internal mine access and haul roads, water pipelines and underground utilities, and electricity supply to the project site from Lindis Crossing via a new 66kV overhead powerline that will follow the existing road reserve corridor;

- A realignment of part of Thomson Gorge Road, via Ardgour Station (Ardgour Rise) is planned to provide public access through to the Manuherikia Valley.
- Main explosives magazines and emulsion mixing facilities (located outside the project site on Ardgour Terrace);
- The establishment of non-operational infrastructure associated with the BOGP on the Ardgour Terrace, including security, first aid and administrative offices, geology facilities, high voltage substation and temporary construction workers accommodation; and
- The establishment of pest exclusion area(s) for ecological enhancement activities.

The exact depths of earthworks associated with these activities is unknown; however, all will result in the removal of all archaeological remains within their footprints.

2 Statutory Requirements

The legislative requirements relating to heritage are provided below, including the Heritage New Zealand Pouhere Taonga Act 2014 (HNZPTA 2014), Fast Track Approvals Bill 2024 (FTB 2024), Conservation Act 1987, Resource Management Act 1991 (RMA), and Protected Objects Act 1975. It is important to note that archaeological sites are defined in the HNZPTA 2014 primarily as sites associated with human activity prior to 1900; however, the RMA 1991 and Conservation Act 1987 take a more holistic approach to heritage that has no age limit.

2.1 Heritage New Zealand Pouhere Taonga Act 2014

HNZPT administers the HNZPTA 2014, and the purpose of this Act is to promote identification, protection, preservation, and conservation of New Zealand's historical and cultural heritage. The act provides definitions of archaeological sites, historic areas, and historic places.

An **archaeological site** is

(a) any place in New Zealand, including any building or structure (or part of a building or structure), that--:
  (i) was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and
  (ii) provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and
(b) includes a site for which a declaration is made under section 43(1)

Additionally, HNZPT has the authority (under section 43(1)) to declare any place to be an archaeological site if the place

(a) was associated with human activity in or after 1900 or is the site of the wreck of any vessel where that wreck occurred in or after 1900; and
(b) provides, or may be able to provide, through investigation by archaeological methods, significant evidence relating to the historical and cultural heritage of New Zealand.

A **historic area** is an area of land that

(a) contains an inter-related group of historic places; and
(b) forms part of the historical and cultural heritage of New Zealand; and
(c) lies within the territorial limits of New Zealand.

A **historic place**

(a) means any of the following that forms a part of the historical and cultural heritage of New Zealand and that lies within the territorial limits of New Zealand:
  (i) land, including an archaeological site or part of an archaeological site:
  (ii) a building or structure (or part of a building or structure):
  (iii) any combination of land, buildings, structures, or associated buildings or structures (or parts of buildings, structures, or associated buildings or structures); and
(b) includes any thing that is in or fixed to land described in paragraph (a).

Any person who intends carrying out work that may damage, modify or destroy an archaeological site, or to investigate a site using invasive archaeological techniques, must first obtain an archaeological authority from Heritage HNZPT. The process applies to sites on land of all tenure including public, private and designated land. The Act contains penalties for unauthorised site damage or destruction.

The archaeological authority process applies to all sites that fit the HNZPTA definition, regardless of whether

- the site is recorded in the New Zealand Archaeological Association (NZAA) Site Recording Scheme (ArchSite), listed by HNZPT, or scheduled under a district plan;

- The site only becomes known about as a result of ground disturbance, and/ or;
- The activity is permitted under a district or regional plan, or a resource or building consent has been granted.

An additional role of HNZPT is maintaining the New Zealand Heritage list, which is a continuation of the Register of Historic Places, Historic Areas, Wāhi Tapu, and Wāhi Tapu Areas. The list can include archaeological sites. The purpose of the list is to inform members of the public about such places and to assist with their protection under the Resource Management Act 1991.

2.2 Conservation Act 1987

The Conservation Act 1987 defines **conservation** as "*the preservation and protection of natural and historic resources for the purpose of maintaining their intrinsic values, providing for their appreciation and recreational enjoyment by the public, and safeguarding the options of future generations.*" This provides for the protection of historic resources, a wide definition, where **historic resource** means a historic place as per the HNZPTA 2014 (see Section 2.1); and includes any interest in a historic resource.

The Act sets out the majority of DoC's responsibility and roles. Under Section 6, DoC has a particular responsibility to interpret and administer the act to give effect to the principles of the Treaty of Waitangi and build effective conservation relationships with mana whenua. Section 6 sets out the functions of DoC which includes but is not limited to, in relation to historic resources:

- to manage for conservation purposes, all land, and all other natural and historic resources, for land managed by DoC and for land whose owner agrees with the Minister they should be managed by DoC
- to advocate the conservation of natural and historic resources generally.
- to promote the benefits to present and future generations of—the conservation of natural and historic resources generally and the natural and historic resources of New Zealand in particular; and the conservation of the natural and historic resources of New Zealand's sub-Antarctic islands and, consistently with all relevant international agreements, of the Ross Dependency and Antarctica generally; and international co-operation on matters relating to conservation:
- to the extent that the use of any natural or historic resource for recreation or tourism is not inconsistent with its conservation, to foster the use of natural and historic resources for recreation, and to allow their use for tourism.

The public conservation land DoC administers has different layers of protection, depending on which category or land status it holds under various legislation, which is complex often with additional or multiple layers of protection overlaying each other. Categories or land status may include, but are not limited to, National Parks, specially protected areas, wilderness areas, amenities area, reserves (e.g., historic, scientific, recreation as per Reserves Act), marginal strips, stewardship areas and DoC is also party to land covenants. To implement conservation, the protection of historic resources within public conservation land is guided by DoC's general policy, conservation management strategies (CMS) and conservation plans as statutory documents and may differ between the category or land status of public conservation land. This means that for projects planned on public conservation land, DoC must be contacted to determine their requirements for assessment of effects on historic resources, any requirements such as CMS or conservation plans, for managing historic resources when identified during assessments. Assessments of historic resources may be required for landowner or affected party consultation and consent for the archaeological authority process under the HNZPTA 2014, Resource Consent, or obtaining a concession or access agreement from DoC.

2.3 Reserves Act 1977

The Reserves Act 1977 is administered by DoC and provides for the acquisition of land for reserves (DOC, 2024). The primary aim of the Reserves Act is to provide areas with high conservation values or public recreational and

educational values with protection to ensure that they are preserved and effectively managed for enjoyment of the public. There are three main functions of the Reserves Act:

- To provide for the preservation and management, for the benefit and enjoyment of the public, areas possessing some special feature or values such as recreational use, wildlife, landscape amenity or scenic value.
- To ensure, as far as practicable, the preservation of representative natural ecosystems or landscapes and the survival of indigenous flora and fauna, both rare and commonplace.
- To ensure, as far as practicable, the preservation of access for the public to the coastline, islands, lakeshore and riverbanks and to encourage the protection and preservation of the natural character of these areas.

Reserves may be administered by the Minister of Conservation or other ministers, DoC, boards, trustees, local authorities, societies, and other organisations that are appointed to control and manage the reserve, or in whom reserves are vested (DOC, 2024).

Reserves are placed into eight main categories in the Reserves Act. Maintainance or administration of these require alignment with the Wildlife Act 1953 with respect to fauna, and the HNZPTA 2014 with respect to archaeological features (see Section 2.1). Of these eight categories of reserves, historic reserves hold the most relevance to the protection and management of archaeological and heritage sites. **Historic reserves**: Historic reserves are purposed towards protecting and preserving places, objects and natural features that are considered as of historic, archaeological, cultural, educational, and other special interest. Historic reserves require administration and maintainance to ensure that the structures, objects, and sites illustrate the history of New Zealand and that their other values (i.e., scenic, archaeological, geological, biological, or flora/fauna) are managed and protected.

Other categories of land are also included under the Reserves Act. The owner of any private land or a lessee of any Crown land may apply for their land to be declared **protected private land** under and subject to any terms of agreement between themselves and the Minister. This requires the land to possess qualities relating to those within the eight main categories of reserve. Similarly, **conservation covenants** may be entered into with owners of private land or holders of Crown land under lease to manage the land in order to preserve the natural environment without the need to purchase the land. **Nga Whenua Rahui Kawenata** may be entered by Māori landowners (DOC, 2024).

2.4 Resource Management Act 1991

The RMA 1991 defines historic heritage as those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities. Historic heritage includes historic sites historic sites, structures, places, and areas; archaeological sites; and sites of significance to Māori (including wahi tapu); and surroundings associated with the natural and physical resources. These categories are not mutually exclusive, and some archaeological sites may include above ground structures or may also be places that are of significance to Māori. It should be noted that this definition does not include the 1900 cut-off date for protected archaeological sites as defined by the HNZPTA 2014. Any historic feature that can be shown to have significant values must be considered in any resource consent application.

The RMA requires city, district, and regional councils to manage the use, development, and protection of natural and physical resources in a way that provides for the well-being of today's communities while safeguarding the options of future generations. The protection of historic heritage from inappropriate subdivision, use, and development is identified as a matter of national importance (section 6f).

Central Otago District Council (CODC) District Plan identifies the significance of historic buildings to the character of region. The heritage resources identified by the council are included in Schedule 19.4: Register of

Heritage Buildings, Places, Sites and Objects and Notable Trees. The register includes all HNZPT Category 1 and Category 2 listed sites, which have been evaluated according to criteria outlined in the HNZPTA 2014.

Iwi/hapu management plans are planning documents that are recognised by an iwi authority, relevant to the resource management issues, including heritage, of a place and lodged with the relevant local authority. They have statutory recognition under the RMA 1991. Iwi Management Plans set baseline standards for the management of Māori heritage and are beneficial for providing frameworks for streamlining management processes and codifying Māori values. Iwi Management Plans can be prepared for a rohe, heritage inventories, a specific resource or issue or general management or conservation plans (NZHPT, 2012).

Aukaha (formerly Kāi Tahu Ki Otago) is a manawhenua-owned consultancy representing five papatipu rūnaka across Otago: Te Rūnanga o Waihao, Te Rūnanga o Moeraki, Kāti Huirapa Rūnaka ki Puketeraki, Te Rūnanga o Ōtākou, and Hokonui Rūnanga. Kāi Tahu Ki Otago Natural Resource Management Plan was lodged with the Otago Regional Council in 2005. This plan covers mostly natural resources; however, wāhi tapu, mahika kai, and the cultural landscape are all addressed for each geographical area the plan covers.

While the CDC has not individually supported these two management plans, it is a signatory to the Te Rōpu Taiao Governance Charter. This is a formal agreement between Otago rūnaka and Otago local authorities to work together at both a collective and individual council level and is acknowledged as a core relationship in both management plans.

Both management plans are recognised by iwi authority Te Rūnanga o Ngāi Tahu. The plans provide explanation of kaitiakitanga, outline cultural values and places of significance, identify primary issues, and provide policy and management guidelines. Several rūnaka and Ngāi Tahu Whānui (of Murihiku and Otago) share an interest in the lakes and mountains near Whakatipu-wai-māori (Lake Wakatipu).

2.5 Fast Track Approvals Act 2024 (FTA 2024)

The FTA 2024 is intended to stream-line the decision-making process for regional and nationally significant infrastructure and development projects. The bill allows for applicants to apply for approvals covering a range of normally separate consents and/or authorities, including several that may apply to heritage (RMA 1991, HNZPTA 2014, Conservation Act 1987 and Reserves Act 1977).

Applicants must apply to the Environmental Protection Authority (EPA). Any approvals, such as archaeological authorities, granted under the FTA 2024 must be treated as if granted under the relevant legislation that establishes it or provides for it (e.g. HNZPTA 2014).

Schedule 8 of the FTA 2024 outlines the process and requirements for applying for an archaeological authority under this legislation. Archaeological sites, historic places and historic areas are defined the same as by the HNZPTA 2014 (see Section 2.1). All applications for archaeological authorities under the FTA 2024 are referred to HNZPT and the Māori Heritage Council, who provide recommendations back to the expert panel.

With regard to revocation or amendment of a conservation covenant, the FTA 2024 allows for the Minister of Conservation to amend or revoke a covenant with the written consent of the landowner. When considering revocation or amendment, the Minister must consider the purpose of the Conservation Act 1987 and the Reserves Act 1977, the purpose of the covenant, and whether the revocation or amendment will compromise values of regional, national or international status.

Applications for resource consents under the FTA 2024 must include an assessment of the proposed activity against Section 6 of the RMA 2024, which includes the protection of historic heritage from inappropriate subdivision, use and development.

2.6 Protected Objects Act 1975

The Protected Objects Act 1975 was established to provide protection of certain objects, including protected New Zealand objects that form part of the movable cultural heritage of New Zealand. Protected New Zealand objects are defined by Schedule 4 of the act and includes archaeological objects and taonga tūturu. Under Section 11 of the Protected Objects Act 1975, any newly found Māori cultural objects (taonga tūturu) are automatically the property of the Crown if they are older than fifty years and can only be transferred from the Crown to an individual or group of individuals through the Māori Land Court. Anyone who finds a complete or partial taonga tūturu, accidentally or intentionally is required to notify the Ministry of Culture and Heritage within:

(a) 28 days of finding the taonga tūturu; or

(b) 28 days of completing field work undertaken in connection with an archaeological investigation authorised by HNZPT.

3 Methodology

This heritage assessment has been prepared in accordance with HNZPT's (2019) guideline on preparing a heritage assessment. Presented below are the methods used to gather information to identify the heritage potential of the project area, determine the significance, and assess the effects of the proposed work on heritage values.

3.1 Historical Research

Documentary research was undertaken to inform on the heritage resources within the project area, including consideration of the physical environment, historical background, previous investigations, and heritage context. The physical environment and setting section considers the geomorphology and land use, and identifies environmental factors that may influence how the site was occupied through time. The historical background first provides an overview of human history for the wider area before narrowing down on evidence that is specific to the project area itself to determine the nature and significance of the heritage sites. Previous research and investigation for the project area provide an understanding of research results, areas of modification, and informs on the potential for the proposed works to affect heritage sites. This section also considers the wider context, including the consideration of sites recorded near the project area and how such sites are represented in the heritage and archaeological record at the local, regional, and national level. Sources utilised for this research include:

- Published primary and secondary sources for Bendigo and Central Otago,
- Ka Huru Manu,
- Historic newspaper articles through PapersPast,
- Historic photographs through DigitalNZ, Hocken Snapshop, Te Papa and National Library of New Zealand,
- Historic maps accessed via Prover and from Archives New Zealand,
- TLA archives and records,
- ArchSite,
- The HNZPT archaeological reports digital library,
- New Zealand Heritage List/Rārangi Kōrero.

3.2 Survey Methodology

Three key sources of information were compiled and analysed as part of the archaeological surveys. These included aerial imagery, LiDAR and a physical survey of the survey area. Where sites could not be identified or accessed due to vegetation or topography during the pedestrian survey, the recent LiDAR and historical imagery, alongside information from the historical record and previous archaeological investigations, were used to inform an understanding of site location and spatial extent.

3.2.1 Aerial Imagery

Historic aerial imagery, dating to the 1950s and 1980s, of the survey area was accessed via Retrolens. The aerial imagery was compared with features identified during the physical survey, the 2018 LiDAR data, and associated 2018 ortho-photos supplied by Matakanui Gold Ltd. By comparing the historical images with more recent data, it was possible to recognise archaeological potential, and identify features established in the 1950s or onwards and the extent to which mining from the 1950s onwards has impacted archaeological sites throughout the survey area.

3.2.2 LiDAR

LiDAR is useful in identifying points of interest, establishing site extents and spatial relationships of sites and features that are not identifiable or obvious when on the ground. In recording and heritage management of archaeological sites Jones & Bickler (2018) have identified that while New Zealand archaeologists are proficient and better at detecting individual sites at a local level, "visual manual detection at larger scaler is both time consuming and costly" (Jones & Bickler, 2018). In contrast LiDAR data can generate terrain models for larger

areas covered in heavy and dense vegetation, as well as areas of rough terrain that are difficult to physically survey. Not only does LiDAR offer the ability to identify previously unrecorded sites in such areas, it also helps to map previously recorded sites as well as refine data collected prior to GIS and GPS. Even where archaeological sites have in the past been well drawn and mapped these are predominantly not georeferenced and frequently not to scale. LiDAR can be used to refine site extents and boundaries with geographical precision (Jones & Bickler, 2017).

LiDAR data from 2018 was provided by Kim Bunting of Matakanui Gold Ltd. Visual inspection of the LiDAR data provided included examination of raster-derived surfaces (i.e. hillshade) and high-resolution contours in order to identify unrecorded archaeological sites and define recorded archaeological sites. Details attained from the LiDAR data included location, extent and types of possible archaeological sites, which contributed to interpretation of individual sites as well as wider archaeological landscapes throughout the survey area. The LiDAR data also displayed distinguishable evidence of post-1950s mining and its potential impact on archaeological sites.

3.2.3 Pedestrian Surveys

Pedestrian surveys of the project area were undertaken in November 2017, February and December 2018, August and November 2021, March 2021, August 2022, February 2023, April-May 2024, and December 2024 by NZHP archaeologists (Dr Naomi Woods, Megan Lawrence, Phoebe Scrivener, Julia Lewis-Trainor, Jasmine Weston, Victoria Ross, Alix Muir and Claire Thorrold) and Matt Sole of Kopuwai Consulting. These surveys are described in more detail in Section 7, as each was undertaken for a specific purpose.

A GPS unit loaded with previously recorded sites was carried and the survey paused when previously recorded or unrecorded features were encountered to allow for closer inspection. Previously recorded features or sites were briefly inspected and photographed noting any new features, condition and extents, while previously unrecorded sites and features were recorded in detail and plotted on the GPS. For localised features such as hut floors or pits, a single GPS point was taken. For larger features such as patches of tailings or water races, several points were taken to show the extent.

The topography and dense vegetation (especially matagouri and briar) of the area did not allow for standardised transects to be adhered to in many cases. In steep areas, transects were centred on valley floors or ridgelines to maximise visibility of features and other team members. In high areas, ridgelines and hill tops were used to view sparsely vegetated areas and identify potential heritage remains. Areas that could not be accessed or viewed were studied through the LiDAR imagery and aerial photographs, which went some way to offset these limitations.

3.3 Assessment of Heritage Values

The assessment of heritage values follows the criteria established by HNZPT in *Significance Assessment Guidelines* (Heritage New Zealand Pouhere Taonga, 2019), as requested by the DoC. This guideline was intended to provide standardised assessment criteria for considering historic places and areas for inclusion on the New Zealand Heritage List/Rārangi Kōrero. The guideline requires a twofold assessment, firstly considering the nature of the ascribed heritage value, and secondly the degree of their significance. The degree of significance is not rigorously defined in the guideline, but examples include 'special' or 'outstanding' for the highest values, and at the other end of the spectrum there may be 'little' to 'no heritage value' or even 'adverse' or 'negative value'.

Table 3-1. Criteria for the assessment of heritage values as defined in HNZPT's *Significance Assessment Guidelines* (Heritage New Zealand Pouhere Taonga, 2019).

Criteria	Threshold for Inclusion	Key Questions
Aesthetic significance or value	The place has, or includes, aesthetic qualities that are considered to be especially pleasing, particularly beautiful, or overwhelming to the senses, eliciting an emotional response. These qualities are demonstrably valued, either by an existing community or the general public, to the extent that they could be expected to experience a sense of loss if the qualities which evoke the aesthetic value were no longer there.	1. What aesthetic qualities is the place recognised for? 2. How has the importance of the aesthetic qualities of the place been acknowledged or acclaimed by the community or group? 3. How do the aesthetic qualities compare with other places with similar qualities?

Archaeological significance or value	The place provides, or is demonstrably likely to provide, physical evidence of human activity that could be investigated using archaeological methods. Evidence obtained as a result of an archaeological investigation could be expected to be of significance in answering research questions, or as a new or important source of information about an aspect of New Zealand history.	1. Is the place likely to contain physical evidence of human activity that archaeological methods could locate or identify? 2. What aspect of New Zealand history could this evidence provide information about? 3. Is the physical evidence, located through archaeological methods, likely to provide significant evidence about this aspect of New Zealand history? 4. Is this place the only, or one of a very few, sites that can provide this evidence about New Zealand history?
Architectural significance or value	The place reflects identifiable methods of construction or architectural styles or movements. When compared with other similar examples, or in the view of experts or relevant practitioners, it has characteristics reflecting a significant development in this country's architecture. Alternatively, or in conjunction with this, the place is an important or representative example of architecture associated with a particular region or the wider New Zealand landscape.	1. What method of construction or architectural style or movement does the place reflect? 2. Why is this construction method, style or movement of importance in New Zealand history? 3. How well does the place represent this method, style or movement compared to other places?
Cultural significance or value	The place reflects significant aspects of an identifiable culture and it can be demonstrated that the place is valued by the associated cultural group as an important or representative expression of that culture.	1. What culture is associated with this place? 2. How does this place reflect that culture? 3. How has the significance of the place as an important or representative expression of the culture been demonstrated?
Historical significance or value	The place contributes towards the understanding of a significant aspect of New Zealand history and has characteristics making it particularly useful for enhancing understanding of this aspect of history, especially when compared to other similar places.	1. What significant aspect of New Zealand history is the place related to? 2. What does the place contribute to the understanding of that aspect of New Zealand history? 3. How does the place's ability to contribute to the understanding of this aspect of history compare with other similar places?
Scientific significance or value	The place includes, or is demonstrably likely to include, fabric expected to be of significance in answering research questions or a new or important source of information about an aspect of New Zealand's cultural or historical past through the use of specified scientific methods of enquiry.	1. What information could be obtained through scientific methods of enquiry? 2. What fabric exists at the place that might help to provide this information? 3. How does its ability to provide information through scientific methods compare with other similar places?
Social significance or value	The place has a clearly associated community that developed because of the place, and its special characteristics. The community has demonstrated that it values the place to a significant degree because it brings its members together, and they might be expected to feel a collective sense of loss if they were no longer able to use, see, experience or interact with the place.	1. Is this a place that brings people together? 2. Is there an existing community associated with the place? 3. How has the community demonstrated that they value the place?
Spiritual significance or value	The place is associated with a community or group who value the place for its religious, mystical or sacred meaning, association or symbolism. The community or group regard the place with reverence, veneration and respect, and they might be expected to feel a collective sense of loss if they were no longer able to use, see, experience or interact with the place.	1. Is there a community or group who value the place for its religious, mystical or sacred meaning, association or symbolism? 2. How is the community or group's shared belief, faith or spiritual experience demonstrated at this place?
Technological significance or value	The place includes physical evidence of a technological advance or method that was widely adopted, particularly innovative, or which made a significant contribution to New Zealand history OR The place reflects significant technical accomplishment in comparison with other similar examples, or in the view of experts or practitioners in the field, and has characteristics making the place particularly able to contribute towards our understanding of this technology.	1. What technological advance or method does the place demonstrate? 2. What physically demonstrates the technology used? 3. Why is this technology of importance in New Zealand history? 4. How well does the place represent this technology compared to other places?
Traditional significance or value	The place reflects a tradition that has been passed down by a community or culture for a long period, usually generations and especially since before living memory, and has characteristics reflecting important or representative aspects of this tradition to a significant extent.	1. What community or culture has practised, or is the custodian of, the tradition that is associated with this place? 2. What tradition is associated with this place? 3. What physical aspects of the place reflect the tradition? 4. How is this place an important or representative expression of the tradition?

In addition to the above, the assessment of archaeological values also takes into account the criteria established by HNZPT (2019):

- The **condition** of the site(s).
- Is the site(s) unusual, **rare or unique**, or notable in any other way in comparison to other sites of its kind?
- Does the site(s) possess **contextual value**? Context or group value arises when the site is part of a group of sites which taken together as a whole, contribute to the wider values of the group or archaeological, historic or cultural landscape. There are potentially two aspects to the assessment of contextual values; the relationship between features within a site, and the wider context of the surroundings.
- **Information potential**. What current research questions or areas of interest could be addressed with information from the site(s)? Archaeological evaluations should take into account current national and international research interests, not just those of the author.
- **Amenity value** (e.g. educational, visual, landscape). Does the site(s) have potential for public interpretation and education?
- Does the site(s) have any special **cultural associations** for any particular communities or groups (e.g., Māori, European, Chinese.)

The criteria outlined above help to build an overall assessment of significance of a site, and NZHP have adopted the following levels of overall heritage value for individual sites (Table 3-2). These levels of significance follow the recommendations proposed by Department for Transport (2008); although, this steers away from the use of local, regional, and local importance, which Kerr (2013) argues is irrelevant to the assessment process. It is important to note that it is not possible to fully understand the significance of subsurface sites, and that the significance of a site may change on the basis of what is found during the work programme. For this assessment, previously and newly recorded sites have been assessed individually to identify appropriate treatment for specific features and site complexes within the project area, including levels of recording, potential research questions and/or protection recommendations.

Table 3-2. Levels of overall heritage value for individual sites (adapted from DoT, 2008).

Level of Significance	Criteria
Very High	• Heritage sites displaying strong and significant links to international events, processes or systems • Sites of international importance displaying exceptional integrity • Sites of international importance displaying exceptional rarity
High	• Listed heritage sites, including those of listing quality and importance o Category 1: places of special or outstanding historical or cultural heritage significance or value; o Category 2: places of historical or cultural heritage significance or value; and • Scheduled heritage sites, including those of scheduling quality and importance • Heritage sites with exceptional values on a national scale
Medium	• Heritage sites that can be shown to have moderate values
Low	• Heritage sites with limited value, including those that are highly represented, have low information potential, have poor preservation, and/or poor survival of contextual association
Negligible	• Sites with very little surviving heritage interest
Unknown	• The importance of the site is not yet known

In addition to considering the values of individual heritage sites and features, it is important to assess the heritage values of the wider landscape as the two are not necessarily directly comparable. In a landscape, he connections and relationships are often just as important as the individual sites. For example, a landscape or site complex that contains a representative sample of a number of inter-related sites that in isolation have low heritage value may have higher cumulative value than the sites themselves. Table 3-3 outlines the criteria used by NZHP to assess the historic heritage values of heritage landscapes, adapted from McClean (2007) and Stephenson, Bauchop and Petchey (2004).

Table 3-3. Levels of overall heritage value for site complexes and landscapes.

Level of Significance	Criteria
Very High	• Heritage areas displaying strong and significant links to international events, processes or systems • Heritage areas or landscapes displaying exceptional time depth in the New Zealand context
High	• Listed heritage areas, including those of listing quality and importance • Scheduled heritage areas, including those of scheduling quality and importance • Heritage areas with a high level of: o Integrity; o Representativeness; o Uniqueness; and/or o Density of individual sites with medium to high heritage values
Medium	• Heritage complexes or landscapes that are represented elsewhere but in small number • Complexes or landscapes with a moderate level of preservation of heritage sites or features • Complexes or landscapes with minor to moderate gaps in representative site types, phases of activity, or key technologies
Low	• Heritage complexes or landscapes that are well represented elsewhere • Complexes or landscapes with a poor level of preservation of heritage sites or features • Complexes or landscapes with significant gaps in representative site types, phases of activity, or key technologies
Negligible	• Landscapes with few sites of heritage interest.
Unknown	• The importance of the site complex or landscape is not yet known

3.4 Assessment of Effects

After determining that there is evidence that heritage is present within the project area and evaluating its value, an assessment of the effects of the proposed work on those values was completed. Specifically, consideration was given to the following matters as outlined by HNZPT (2019):

- How much of the site(s)[1] will be affected, and to what degree, and what effects this will have on the values of the site(s).
- Whether the proposed work may increase the risk of damage to the site(s) in future. For example, change from farming to residential use may make sites vulnerable to increased pedestrian and vehicular activity.
- Whether a re-design may avoid adverse effects on the site(s). It is recognised that detailed evaluation of alternatives may be beyond the scope of the heritage assessment, however, some consideration of alternatives should be considered where possible.
- Possible methods to protect sites, and avoid, minimise or mitigate adverse effects should be discussed. These will form the basis of any recommendations in the final section.

The magnitude of impact on heritage values is defined below with a scale ranging from no impact to major impact. In most instances these impacts are adverse; however, there may also be positive impacts on the site.

- **Major** - impact to the site, such that the asset is totally altered (*e.g.*, a site is totally destroyed).
- **Moderate** - impact to the site, such as the asset is significantly modified (*e.g.*, at least half of a site is affected)
- **Minor** - impact to the site, such that the asset is slightly different (*e.g.*, a small portion of the site is affected).
- **Negligible** - slight changes to site that hardly affect it.
- **No impact** - the works will not affect the site.

[1] For this assessment, "site" can refer to individual features, site complexes and the heritage landscape.

4 Physical Environment and Setting

The project area starts at the north-eastern side of Dunstan Mountains and ending just shy of Thomsons Saddle (Figure 4-1). A number of streams run and converge throughout the project area between the valleys and spurs of the Dunstan Mountains. These are Rise and Shine Creek, Shepherds Creek, Clearwater Creek and Jean Creek as well as their various unnamed tributary streams. The creeks feed into the Mata-au/Clutha River and what is today Lake Dunstan, formed in by the construction of the Clyde Dam in the 1980s to 1990s (Veitch, 2003). The Māori name for the Dunstan range is Matakanui which translates as "big burn on the face", though the origin of this name is unknown (Briden & Schmidt, 2012).

The closest main centre is Cromwell, situated approximately 18km southwest of the project area as the crow flies, at the opposite end of Lake Dunstan. One main road traverses the survey area: the Thomson Gorge Road running between Bendigo and Omakau. Other smaller access tracks diverge from this road. Presently, while Thomson Gorge Road is open for public use, the road, the smaller access tracks, and the surrounding land within the project area, is predominantly used for farming and mining activity.

4.1 Geomorphology

Schist rock dominates the Central Otago landscape and numerous outcrops are present throughout the project area (Figure 4-2). Schist rock is bedded in flat sheets that crumble and break off into slabs, which makes it useful as a building material. The process that produces schist also produces quartz, a mineral that often contains gold, antimony, and tungsten. All three metals are valuable and the discovery of these resources heavily influenced the history of Central Otago (Hamel, 1993).

The predominant soils within the project area are classified as Arrow, Conroy hill and Alexandra (GrowOtago, 2014). Vegetation across the project area can be broken into three distinct categories: Pasture, dense shrub and tussock grassland. Grassy pastures extend along the wider valleys within the survey area, especially the valleys leading to Come-in-Time, Rise and Shine, and Srex. Many of the smaller valleys and creek banks are overgrown with dense shrub including matagouri and Spaniards, making terrain difficult if not impossible to traverse. This shrub was also encountered along Clearwater Creek along with larger overgrown willow trees. Along the peaks and ridgelines of the Dunstan Mountains the vegetation throughout the project area predominantly comprised tussock land.

4.2 Landscape Transformations

The Rise and Shine Valley has been extensively modified throughout the nineteenth and twentieth centuries. Early pastoral occupation saw removal of native vegetation (scrub with pockets of podocarp and kowhai) and its replacement with pasture, and mining from the 1860s onwards has changed the topography in many areas. Water races have diverted natural waterways and sluicing has widened existing and created new gullies on the lower alluvial slopes. The waste rock from mining has been used to create terraces or left in piles, further altering the appearance of the landscape. Modern farming and mining activity has seen the formation of vehicle tracks and areas of rook raking up and down the valley, leaving piles of soil and tree roots.

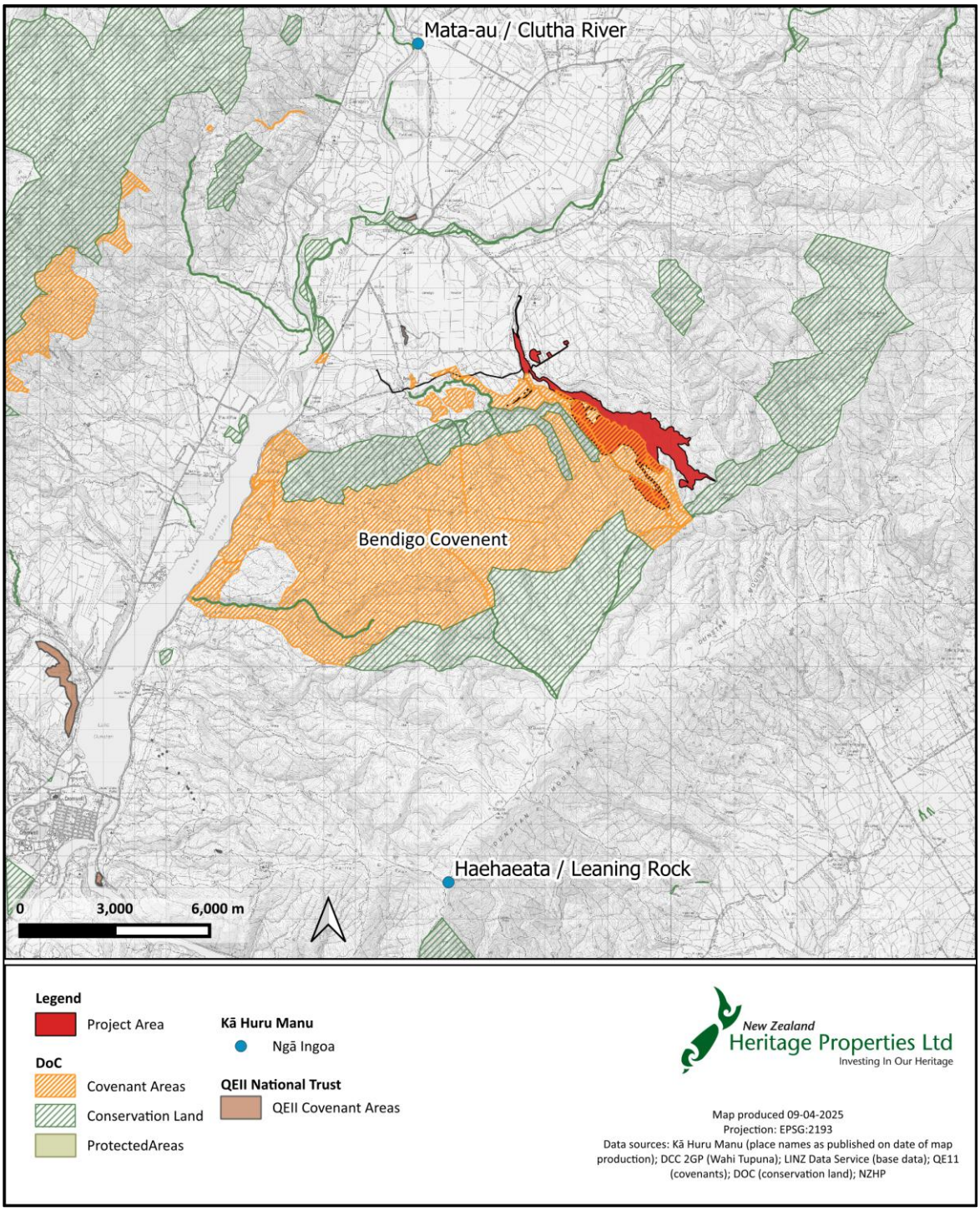


Figure 4-1. The broader geographical setting of the project area.

Figure 4-2. Schist outcrops within the project area (NZHP 2018).

5 Historical Background

NZHP carried out documentary research into the historical background of the survey area, including a summary of the Māori occupation, colonial pastoral occupation and mining activity. This documentary research contributes to the identification of the physical, cultural, and social processes that have shaped the form and distribution of historic material. Additionally, historical background can be used to inform the interpretation of archaeological contexts and material whenever they are encountered.

5.1 Māori Occupation in Central Otago

The Otago region was first settled and navigated by Māori communities descended from some of the earliest Polynesian settlers to Aotearoa. Archaeological evidence shows that people had settled Central Otago by the fourteenth century (Walter et al., 2017); although, separate lines of evidence through whakapapa and oral tradition recognise the Māori occupation of the region earlier than this (Te Rūnanga o Kaikōura, 2007). Three principal streams of descent are recognized in the traditions of Kāi Tahu whānui (Waitaha, Kāti Mamoe and Kāi Tahu). The first people to arrive in Te Waipounamu (South Island) were linked through whakapapa to Waitaha, associated with the canoes *Waka-A-Raki* and *Uruao* (O'Regan, 2001: 4). Certain traditions and texts also reference Rapuwai and Kāti Hāwea as groups established in Te Waipounamu during the earliest period of settlement, though the traditions of these groups are often interwoven into the histories and whakapapa of Waitaha (Anderson, 1998: 18-20; see Tau, 2003: 159 for discussion). According to O'Regan (2001) and Tau (2003), Waitaha descendants were associated with the first explorations, the naming of places and the earliest landscape transformations, with all major landmarks in Te Waipounamu derived from Waitaha tradition (see also Whatahoro, 1886; Stack, 1898). For example, Rakaihautu, the captain of the canoe *Uruao*, is said to be responsible for the creation of the inland lakes and lagoons, including Whakatipu and Hawea. For some, the stories connected to Waitaha are considered significant for the establishment of a unique mythology and whakapapa specific to the iwi and landscapes in the south (O'Regan, 2001).

In contrast, there are detailed documented histories relating to the seventeenth and eighteenth centuries, many of which often recount skirmishes between Kāti Mamoe and Kāi Tahu descendants[2] (e.g., Anderson, 1998; Tau and Anderson, 2008). The seventeenth century is associated with the movement of several groups related by ancestry and marriage travelling down from Te Ika-a-Maui, later unifying under their common descent from Tahu Pōtiki of Hawke's Bay. During this time Kāi Tahu descendants moved south and went through periods of long-running conflicts, intermarriage, and peace alliances with other established groups. Over time, descendants of these groups would collectively come to be known as Kāi Tahu with the interwoven histories and traditions of groups in Te Waipounamu forming a collective Kāi Tahu identity (O'Regan, 2001: 45).

Characteristically early artefact forms, rock shelters, and moa butchery (or industrial) sites are generally associated with the seasonal movements of Waitaha, Rapuwai, and Kāti Mamoe descendants. The construction of pā and the establishment of more permanent kāika emerges from around the sixteenth and seventeenth centuries onwards, relating to the settlements of Kāti Mamoe and Kāi Tahu. Archaeological material of Māori lifeways (such as shell and bone middens and umu) often overlaps across all periods of Māori history. Recorded archaeological sites have uncovered evidence of Māori settlement and lifeways in the form of rock shelters, pā, urupa, fires, cooking features, working areas, and food resources (including kaimoana). Taonga and other artefacts made from stone, bone, shell, and timber resources have also been identified. This includes worked stone, shell and repurposed animal bone used in the production of tools and ornaments, and wood and plant resources used in the construction of buildings, waka, smaller objects and textiles.

[2] It is important to note that the collective use of Ngāti Mamoe and Ngāi Tahu does not mean that the various hapū groups connecting at an iwi level were acting as a single tribal unit. Instead, Tau and Anderson (Tau and Anderson, 2008: 26) state that individual actions or concerted invasions were conducted mostly at a personal or family level, perhaps facilitated by the interrelatedness of groups through shared ancestry, or through marriage.

While archaeological evidence for Māori settlement is present in Central Otago, settlement patterns are more indicative of migratory routes in use through the region, specifically for seasonal hunting, fishing, and maintaining long-distance trade networks (Parcell, 1951; Peat, 2002; Roxburgh, 1957, 1990; Veitch, 2003). Throughout the region, artefact assemblages and animal butchery sites (including moa) suggest that early Māori communities were utilising seasonal nohoaka (McCraw, 2007). It has been argued by some that there is a lack of evidence for any permanent early Māori settlements having been established within Central Otago (Parcell, 1951; Veitch, 2003); however, this claim is disputed by early Pākehā accounts of older Māori villages no longer in use by the time of European arrival (Anderson, 1983). At the very least, the record of Māori placenames and places of significance recounted in local tradition attest to these early periods of settlement, reinforcing the rich history of Māori communities in the region (Potiki & KTKO Consultancy Ltd, n.d.).

5.1.1 Pā and Kāika

Archaeological evidence shows that the wider area surrounding the Rise and Shine valley may have supported small seasonal nohoaka, with evidence for semi-permanent kāika and pā recorded in ArchSite near coastal areas, and in closer proximity to Whakatipu-wai-māori. This is reinforced by Anderson's map of traditional settlements shown in Figure 5-1 (Anderson, 1982). The closest settlement on this map is Wairere (number 29 on Figure 5-1), but Anderson provides no more details on this settlement.

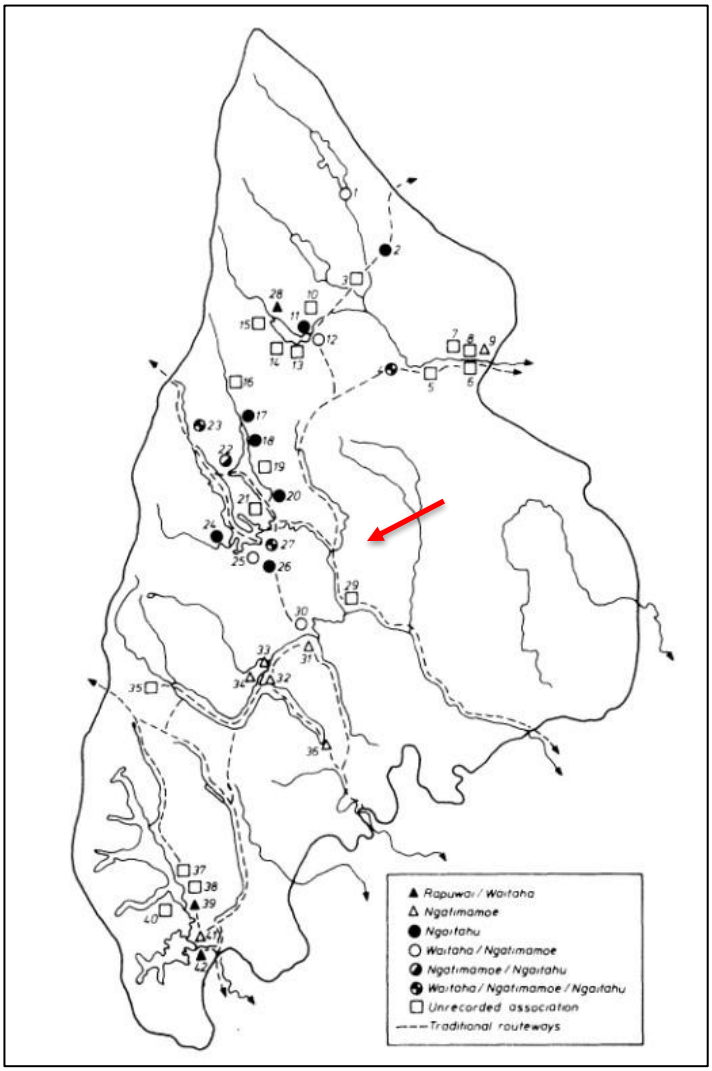


Figure 5-1 Traditional routeways and settlements compiled by Anderson (1982: Figure 2), with approximate location of project area shown by red arrow.

Beattie's annotated maps of Otago depict a range of pre-1840 Māori placenames in the vicinity of the project area (Beattie, n.d.). The source of information for Beattie's annotations stem from a combination of the recollections of Māori informants, fragments of Māori tradition, and notes on historical observations, archaeological discoveries, and analyses of placenames. While the sources for this information differ, the frequency of placenames attest to the length of Māori occupation in this area. Several waterways in close proximity to the project area are named, including Wainui and Waiwera (Figure 5-2). Another annotation notes a peak nearby named Otataika.

5.1.2 Mahika Toi

Stone was an important material for the day to day lives of Māori throughout the country, with stone source locations being one of the driving factors for travel, settlement, and trade. In the Otago region, silcrete and porcellanite raw materials were particularly important during early periods of Māori settlement, with over 300 outcrops mapped in the south-eastern districts of the South Island (Hamel, 2001).

One of the most prized stones for Māori throughout Aotearoa was pounamu (e.g., nephrite and bowenite). Nephrite sources in New Zealand are contained mainly to the west coast of the South Island, with the main sources being found around Lakes Wānaka and Whakatipu-wai-māori (Beck & Mason, 2002) (Figure 5-3). Pounamu sourced from the Great Lakes was transported across Otago and Murihiku by ara tawhito, as both a trading commodity and item of prestige (Coutts, 1971). While the raw material was discovered and transported by early Māori communities (with some of the earliest semi-permanent settlements associated with pounamu artefacts), the use of pounamu became more common and abundant from the sixteenth century onwards (Hamel, 2001).

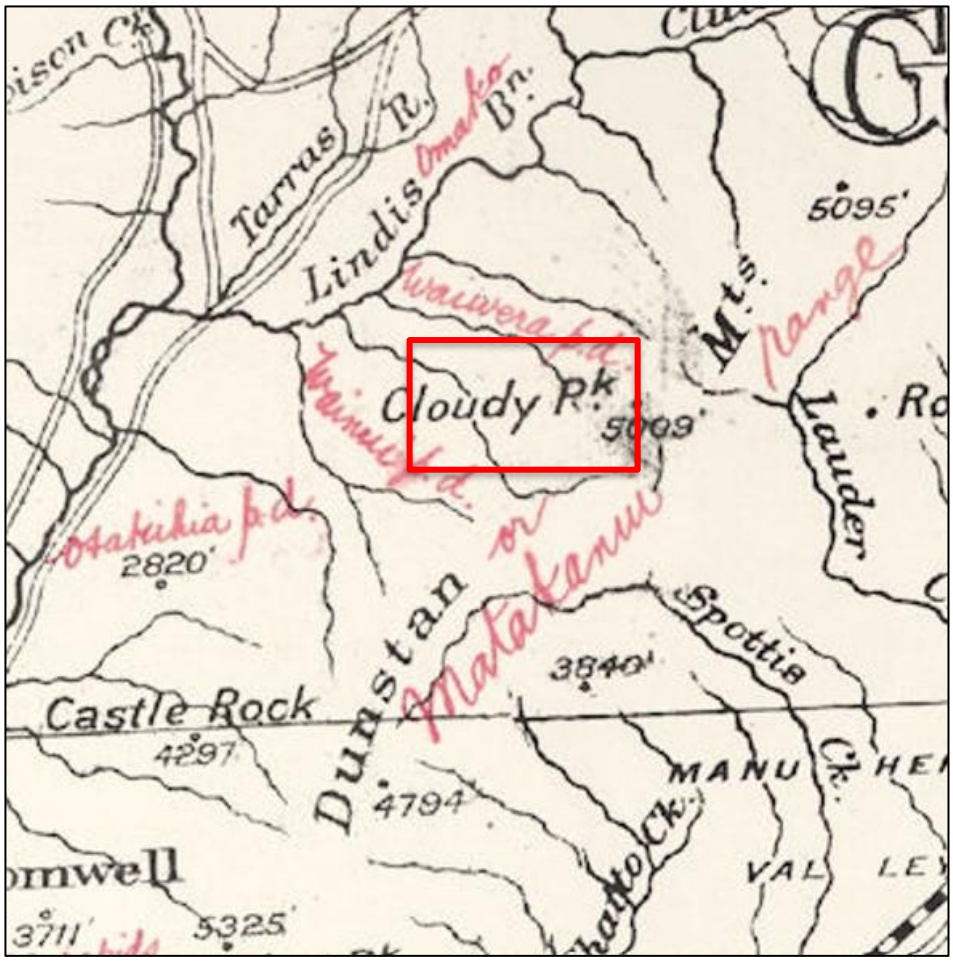


Figure 5-2. Detail of Beattie's map with multiple Māori place names in vicinity of project area (approximate location indicated by red box) (Beattie, 2011).

Figure 5-3. Distribution of pounamu (nephrite and bowenite) in the South Island (Beck & Mason, 2002).

5.1.3 Mahika Kai

Central Otago was utilised during seasonal expeditions for the collection of food resources and raw materials from seasonal settlements known as kāika mahika kai. The settlements are referred to as mahika kai, being "places at which resources were obtained" and being often associated with seasonal camping sites or nohoaka (Potiki & KTKO Consultancy Ltd, n.d.; Williams, 2010). Mahika kai includes marine resources, freshwater fishing, fowling, plants for consumption and trees and plants for material production (Anderson, 1998).

Only tentative details are known about the earliest periods of occupation in the area near the project area, but from archaeological and ecological evidence it appears that the earliest Māori groups in this region took advantage of the abundant moa, small birds and tuna (eels) that lived in and close to the shores of Lake Wanaka and Hawea (Hamel, 1993). Archaeological evidence suggests this activity also took place along the banks of the upper Mata-au (Clutha River), with numerous oven and midden sites recorded approximately 10km to the west of the project area, and many more recorded during the works associated with the formation of Lake Dunstan in the 1980s (Ritchie, 1987). A pit has also been recorded on the east side of Thomson's Saddle (G41/259) that Schmidt and Briden (2012) note could potentially be an umu; however, they note that it is not possible to confirm this without further investigations, and the pit lies in an area covered in prospecting pits of similar size and form.

5.1.4 Ara Tawhito and Nohoaka

Otago is crossed by a complex network of ara tawhito (traditional travel routes), the knowledge of which was passed down from generation to generation and inherited as groups moved south across Te Waipounamu (Kā Huru Manu, 2018). These routes over land and along rivers were utilised to access important food and material resources, and to travel between established communities (Kā Huru Manu, 2018). Ara tawhito followed food resources to sustain their travellers over large distances and the knowledge of local resources came with the knowledge of the routes (Waitangi Tribunal, 1991).

An ara tawhito that passed over Thomsons Saddle was used to provide access between seasonal camps at Moeraki and the inland lakes (Ngai Tahu, 2018). A sketch map made by Mantell in the 1840s shows an ara tawhito heading inland from just north of Waikouaiti that matches with that described as passing through the Dunstan Range via

Thomsons Saddle (Figure 5-4). However, other than passing over the saddle, the precise route of this ara tawhito is not known, so it is not possible to confirm if it passed through the Rise and Shine Valley or along the ridgelines above, or a combination of both. A later annotated map made by oral historian Herries Beattie shows this landscape was well known, with many waterways and landforms named prior to 1840 (Figure 5-2). A hoe (waka paddle), now held by the Otago Museum, was found in a cave above Bendigo Creek in the 1870s (site G41/53), and acts as a tangible link to the use of this area as a travel route in the past.

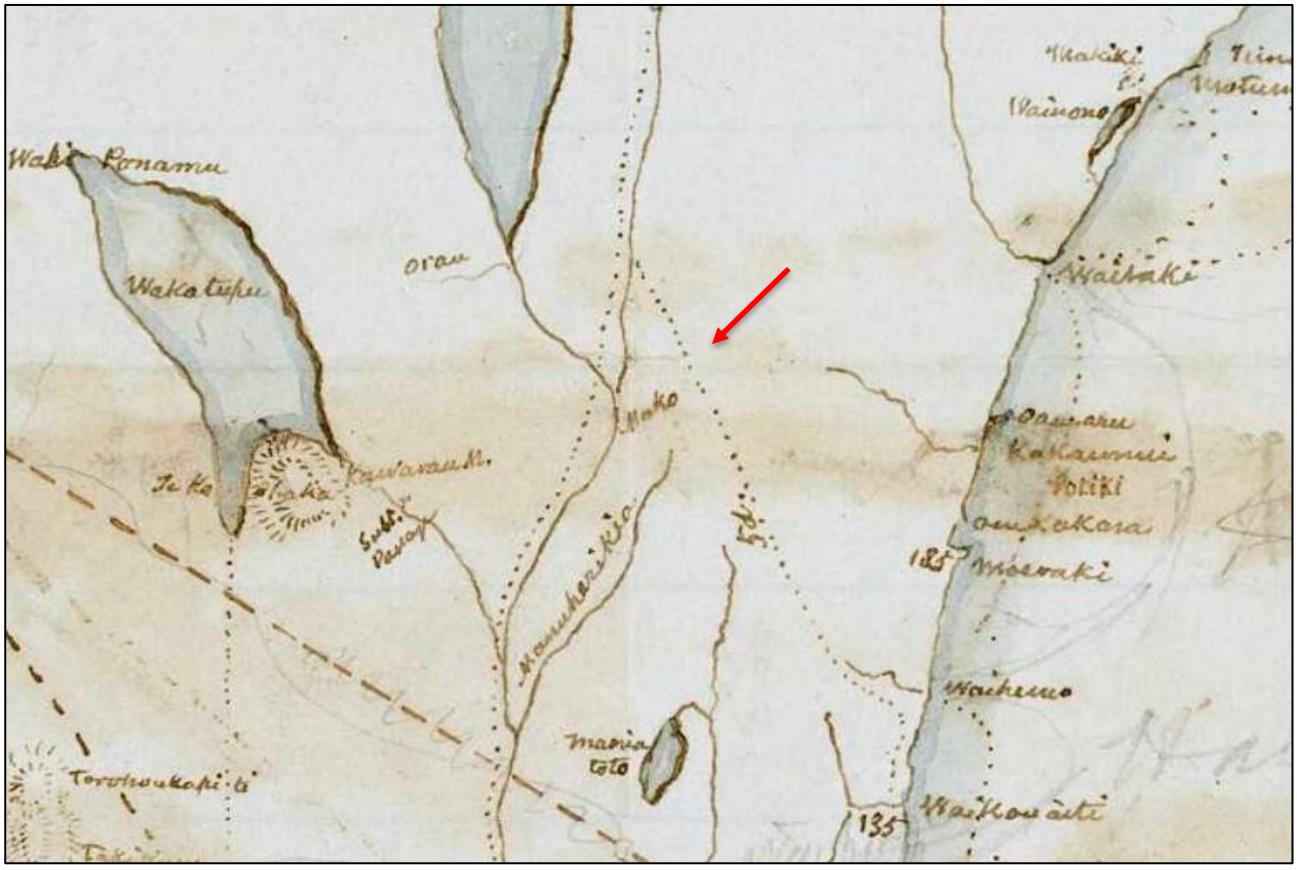


Figure 5-4. Detail of Mantell's 1848 map showing ara tawhito (dotted line) in approximate location of the project area (red arrow) (Mantell, 1848).

On summarising the traditional ara tawhito of the South Island interior, Anderson (1982: Figure 2) identifies the Mata-Au (Clutha River), just to the west of the project area, as an important traditional routeway. The Mata-Au connected the southern coast of Te Waipounamu to the interior, carving a path from the coast to some of the great lakes of Otago, including Whakatipu-wai-māori (Lake Wakatipu) Wānaka, and Hāwea (Te Rūnanga o Ngāi Tahu, 2023).

5.2 Contact and Post-Contact Period Occupation in the Otago Region

The following sections examine the changes that occurred with the arrival of Pākehā to the inland Otago area. Explorers gave way to run holders, who were quickly overtaken by the gold rush. Reasserting pastoral dominance after the first flush of gold fever, run holders fought to purchase the lands they held in lease from the Crown based on pre-emptive rights.

5.2.1 Māori and Pākehā: Guides and Explorers

In 1853 a young Scot, Nathaniel Chalmers, helped drive a herd of cattle from Southland to Dunedin. On the overland trip he met Reko, a Kāi Tahu kaumātua who lived at Tuturau. At Chalmers request to explore inland Otago to the north, Reko agreed to guide him in return for a three-legged pot. In September 1853, Chalmers, Reko, and another Māori companion travelled north from Tuturau. Chalmers found the journey more arduous

than anticipated - his clothes were torn to shreds and his boots had to be replaced by sandals made from flax (New Zealand Historic Places Trust Pouhere Taonga, 2009). Chalmers was the first recorded Pākehā to see Lake Whakatipu-wai-māori and the valleys of the Upper Mata-Au (J. Crawford, 2006); however, while he could see Lake Whakatipu-wai-māori, he never made it to the shores. Chalmers was so sick and exhausted from his journey thus far, that he had to be carried back to friends and he never reached the lake shores (Frazer, 1990).

The infamous stock thief James Mackeznie, namesake for the Mackenzie Country, also saw the Mata-Au as he would have had to cross the river after stealing mobs of sheep from the Rhodes Brothers Station in South Canterbury (J. Crawford, 2006).

5.2.2 Runholders

By the late 1850s, most explorers were looking for land to claim for farming. Early run boundaries relied on natural features such as waterways with wire fencing becoming more common in the 1860s. In Central Otago, the prevalence of schist meant that it was also used for fencing. Station buildings were often constructed near streams or in places with natural shelter from the weather. The early buildings then gave way to a larger complex centred on the station's homestead. Smaller huts were also found on the further reaches of the station's boundaries that would house shepherds and musterers, the huts were usually constructed of easily accessible material such as stone (McIntyre, 2007).

Around the early 1870s rabbit numbers started to be an issue to runholders and rabbiters were employed and paid per skin. Ferrets were also released and poison implemented (McIntyre, 2007).

5.2.3 Gold Miners

Small-scale gold findings were documented intermittently in Otago during the 1850s, but it was not until the 1860s that gold fever began to spread through the South Island. A find near Lindis Pass in 1861 prompted a small gold rush involving 300 miners over a few months, followed by the larger rush of Gabriels Gully in May 1861.

In many areas, the use and re-use of goldfield landscapes has resulted in a palimpsest of mining activities and technologies. Many gold fields were worked over an extended period from the 1860s through to the early twentieth century. Several forms of gold mining technology evolved over this time, with contemporary landscapes leaving traces of complex workings and activities. It is important to recognise that most goldfields were not discrete sites but large integrated systems created by small groups of men (Hamel, 2001). On describing the workers of the Otago gold fields, Hamel states: "these groups range[d] from partnerships of two friends, to registered companies employing dozens of people. Linked to them is an infrastructure of storemen, packers, government officials, road makers, pub keepers, and others, who leave lesser traces of their activities on the landscape" (Hamel, 2001: 135). Miners also contributed to the establishment of fruit growing in Central Otago, some establishing small fruit orchards on their sections of claims (Webster, 1948).

5.2.3.1 Early Goldfields

According to Hamel (2001), the first men to arrive at Otago gold fields were assigned small land areas (8 x 8 yards) with the earliest diggings on river beaches and low terraces. Topsoil and overburden were removed and piled up in heaps next to prospecting pits. Alluvial gold-bearing gravel was lifted out using a whip (a counterbalanced pole swivelled on a post with a bucket on the end). Gravel was then processed for gold, with material washed in pans or wooden mining cradles, using buckets of water or an early hand-cranked machine known as a Californian pump[3] (Hamel, 2001: 127). Unlike the stacked mounds of stone tailings seen at subsequent gold workings, early tailings were generally disposed of into the river. The physical remnants of these early mining activities (paddocking) left

[3] A California pump describes an early processing device with an inclined wooden trough and moving canvas rope (or leather belt) between two wheels. Tight-fitting wooden slats were attached to the belt and a manual crank handle attached to the upper wheel to cycle water from the lower level to the upper level (Ritchie & Hooker, 1997).

pitted landscapes with scattered mound and pothole features (Figure 5-5). Hamel (2001) states that the miners lived in tents associated with low sod or stone walls, sod chimneys and bunks of manuka poles. Shopkeepers also followed the miners, setting up tents near the gold workings. These activities are demonstrated in an 1862 photograph of Gabriels Gully (Figure 5-5). Many of these early river workings have likely been destroyed by flooding or subsequent sluicing and dredging, this includes working in the Clutha gorges. As for evidence for the Serpentine fields only a small section of this area has been surveyed (Hamel, 2001). Chinese goldminers arrived in Otago from 1865, mostly working on small claims and in the creation of water races (McIntyre, 2007).

Figure 5-5 A view of Gabriels Gully in 1862, showing a pitted landscape with various mound and pothole features (Gore, 1862). Also note the frequency of tent sites.

5.2.4 Water Race Technology

The construction of water races quickly developed to bring water to sluicing claims. The technology of race design was introduced from the goldfields of California and Australia, but local innovations occurred rapidly in Otago, leaving a distinct mark on the landscape. The primary function of the races was to bring water to the goldfields although the races were often only one component of a complex hydraulic system that served different functions over time. For example, the water channelled along the races could be used for ground sluicing, the removal of tailings and waste, and later, the operation of hydraulic elevating technology and other machinery used for ore processing (Hamel, 2001). For the most past, many of the water races were initially constructed for ground sluicing, with hydraulic nozzles used for directing powerful jets of water. One important aspect of race technology was that individual races could be modified, enlarged, and rerouted as needs changed. They required regular maintenance, and "race men" were important members of the work force. The huts of the race men and wider work force are often another landscape feature near water races and gold workings.

Generally, races were unpredictable economic ventures. Some were planned, financed, and built by investors, but others were constructed by parties of men coming together to invest their own time and labour. Once construction was completed, races formed a reliable stream of income with companies competing for the water market. As alluvial gold near the surface fell into decline, the demand for water grew and larger races were utilised to feed

hydraulic elevating and other complex extraction technologies (Hamel, 2001). After the boom of the gold rush some of the water races were used for irrigation (McIntyre, 2007).

5.3 History of the Bendigo-Ophir Gold Project Area

The following sections look more closely at the history of the project area, comprising the Rise and Shine and Shepherds Creek valleys and surrounding slopes and alluvial flats. This research illustrates that there is a long history of activity and occupation within the project area beginning with early Māori who traversed the area on their way from the coast to the inland lakes and back, through to the occupation of pastoralists and miners. Particular attention is given to those activities that have shaped the landscape and can inform on the heritage resources that may still be present within the project area. There are three main areas in which mining claims were focused, the Rise and Shine, The Come-in-Time, and Shepherds Creek. The history of each of these claims is outlined in the sections below with key land transactions and events listed in Table 5-1.

Table 5-1. Summary of land transactions and key events records for the project area.

Year	Event	Source
Pre-1858	Ara tawhito passes over Thomsons Saddle and through project area	(Ngai Tahu, 2018)
Run 238		
1858	Run 238 taken up by McLean family	(Hamel, 1993)
1866	"House" (**G41/4**) and sheep yards (**G41/5**) present by this date	SO 16291
1867	Crown Grant issued to McLean Family.	ODI H 381
1874	Morven Hills Station sold by the McLean family, purchased and briefly owned by Col. Whitmore	(Duff, 1978)
1875	Conveyance – Colonel Whitmore to Frederick Gonnerman Dalgerty.	Hamel, 1993
1910	Run subdivided into Bendigo, Ardgour, Northburn Stations.	Hamel, 1993
The Rise and Shine		
1864	Rise and Shine Company gained rights to Tipperary Creek headwaters and started construction of Rise and Shine water race (**G41/584**).	Carpenter, 2012
1865	Rise and Shine Company water race completed (**G41/584**). Henry Featherstone sold his one-sixth share in Rise and Shine Company to co-shareholders.	Carpenter, 2012, (Otago Daily Times, 1865b)
1866	Alfred Perry sold his shares in Rise and Shine Company to John Jones.	Carpenter, 2012
1870	Rise and Shine tailwater leased to Alta Syndicate.	Carpenter, 2013b
1871	Four roomed cottage present near Rise and Shine claim	(Cromwell Argus, 1874)
1872	Rise and Shine tailwater leased to Koh-i-noor syndicate; new reef discovered along the reef line exposed by the Rise and Shine sluicers (**G41/264**).	Carpenter, 2012; Carpenter, 2013b
1873	Rise and Shine Company construct dam (**G41/269**).	(Cromwell Argus, 1873)
1874	Eureka Syndicate formed, headed by John Marsh, and secured lease (**G41/277**).	Carpenter, 2013b
1875	Rise and Shine tailwater leased to Eureka Syndicate.	Carpenter, 2013b
1876	Eureka Syndicate mine affected by flood (**G41/277**). Eureka Syndicate mine no longer worked in October	Carpenter, 2013b
1889	Lidston sold shares to Charles O'Donnell, William Bennet, and W. Gilbert Mouat who formed the Jubilee Company. Jubilee Company purchased water wheel timber, started battery operations, shifted and refurbished Thomson Gorge battery, and explored Mount Moka spur.	Carpenter, 2013b
1890-1	Jubilee Company mine abandoned (**G41/277**).	Carpenter, 2013b
1899	End of the Rise and Shine gold sluicing (**G41/264**).	Carpenter, 2013b
1932	Frank Saxby Austin, William Cameron and George Logan established the Bendigo Rise and Shine Company and open Eureka mine (**G41/277**).	Carpenter, 2013b
1934	Austin, Cameron and Logan sell mine to Otago Gold Prospecting Company who constructed workers' accommodation and manager's house.	Carpenter, 2013b
1935	Bendigo Rise and Shine Company built and installed a crusher, ball mill, berdan pan, Wilfley table and a 10-horsepower motor (**G41/277**).	Carpenter, 2013b
1936	Bendigo Rise and Shine Company constructed inclined tramline	Carpenter, 2013b
1937	Bendigo Rise and Shine Company ceased operations. Shine Again Gold Mining Company form and start mining (**G41/277**).	
1938	Shine Again Gold Mining Company installed five-head quartz battery and new tramline between their mine and the battery (**G41/277**).	Carpenter, 2013b
1942	Shine Again Gold Mining Company mine closed.	Carpenter, 2013b
The Come-in-Time		
1880	John Kane discovered new reef along the ridgeline between the Rise and Shine and Shepherds Creeks, cut water race into north face of Come-in-Time Valley (**G41/586**), purchased and started operating the Eureka battery at the Come-in-Time (**G41/251**).	(Carpenter, 2013b; Cromwell Argus, 1880a)
1881	Come-in-Time mine closed in 1881 (**G41/251** and possibly **G41/604** and/or **G41/605**) and battery sold.	Carpenter, 2013b
1908	Come-in-Time mine reopened by Mechesidec Bospednic (Dick) Edwards; Half of the Matilda battery shifted to Come-in-Time (**G41/251**).	(Otago Witness, 1908)

Year	Event	Source
1910	Come-in-Time mine sold to J. Dunnery and M. Birley, operated over September and October, following which the mine was closed.	Carpenter, 2013b
1913	New Alta Syndicate mined outcrop on the Shepherds Creek side of the claims (**G41/604** and/or **G41/605**)	(Evening Star, 1913)
1915	Alta Syndicate mine closed	Carpenter, 2013b
1918	Edwards and Evans re-open mine	(Otago Witness, 1918)
1920	Birley mines at Come-in-Time	(Appendix to the Journals of the House of Representatives, 1920)
1933	Betts mined Come-in-Time.	Carpenter, 2013b
Shepherds Creek		
1865	Koh-i-noor Syndicate starting mining along Shepherds Creek.	Dunstan Times, 1869
1866	Koh-i-noor Syndicate construct dam.	Dunstan Times, 1869
1871	Construction of Koh-i-noor race.	Carpenter, 2012; Cromwell Argus, 1871a
1869-1871	Unknown group of miners working along Shepherds Creek.	Cromwell Argus, 1871a
1874	End of the use of Koh-i-noor race.	Carpenter, 2013b
1877	Cornelius Maher constructs water race from Shepherds Creek	(*Application for Water Race - Cornelius Maher - Shepherds Creek*, 1877)
1887	Christian Hansen takes over Maher's race	(*Application for Water Race - Christian Hanssen - Shepherds Creek, Bendigo*, 1887)
1898	Water race **G41/6** visible in survey plan	SO 12017
Matakanui-Bendigo Road (**G41/782**)		
1898	Matakanui-Bendigo Road surveyed	SO 12016
1899	Additional funding sought for work on Matakanui-Bendigo Road by Vincent County Council	(Cromwell Argus, 1899)
1902	Matakanui-Bendigo Road noted as now being "fit for dray traffic"	(Dunstan Times, 1902)
Thompsons Gorge Road		
1909	"Rise and Shine track" follows a similar alignment to Thomsons Gorge Road	SO 1204
1975	Modern Thomspon Gorge Road alignment completed	(Otago Goldfields Heritage, 2004)

5.3.1 Mahika Kai, Ara Tawhito, and Nohoaka

As touched upon in Section 5.1 the details about early periods of Māori occupation of the Bendigo area are tentative. The settlement patterns in Central Otago indicate the wider area was used for migratory routes, seasonal hunting, fishing and maintaining long-distance trade networks (Parcell, 1951; Peat, 2002; Roxburgh, 1957, 1990; Veitch, 2003). From the historical record, we know an ara tawhito passed through or close to the project area (the exact route is unknown), but to date no archaeological sites relating to Māori activity have been recorded within the project area, and the closest confirmed Māori sites are approximately 10km to the west. As discussed in Section 5.1, there are numerous examples of seasonal campsites and nohoaka on the banks of the Mata-au to the west of the Rise and Shine Valley and Beattie's annotated maps of Otago depict a range of pre-1840 Māori placenames in the vicinity (Beattie, n.d.).

5.3.2 History of the Morven Hills Station[4] (Sites G41/4 and G41/5)

The increased affordability of pastoral leasing throughout the South Island prompted John McLean, a Scotsman who had been sheep farming in Australia, to move to Canterbury in 1852 with his two brothers Allan and Robertson and daughters Mary and Alexandrina. That same year, they purchased Ashfield, a 10,000-acre property near Christchurch, and Lagmhor, a 30,000-acre block near Ashburton in 1855. In 1858, John McLean heard of a great tract of available land and set off inland in pursuit. Guided by local Māori and following the same routes that Thomson had taken, after some time he found himself at the top of Grandview Mountain overlooking the scenery of Lindis Pass and its endless expanses of tussock covered hills. The Waste Land Board was reluctant to grant a license for the land as a single grazing run. However, under pastoral tenure, leaseholders were also able to claim a pre-emptive right (PR) to up to 50 acres of land on a leasehold Run. The claim for a pre-emptive right had to be based on some kind of an improvement within the fifty acres, which could be as simple as a fence, or in this case,

[4] adapted from Duff, 1978 unless stated

a hut (**G41/4**) and sheep yards (**G41/5**). These areas could be then purchased by the runholder if a third party attempted to purchase the land. These pre-emptive rights were often used strategically to take control of larger areas of land and purchase parts of the run (McAloon, 2008). Mclean's pre-emptive right that falls within the project area is shown in Figure 5-6.

The McLean family eventually purchased the land in four separate leases; on 3rd September 1858 the license for Run 235 of 82,000 acres was granted in the name of John McLean, shortly followed by Run 236 of 120,000 acres in the name of Alexandrina McLean, Run 237 of 66,000 acres in the name of Allan McLean, and Run 238 of 84,000 acres in the name of Robertson McLean. The entire area, comprising almost 400,000 acres, was named the Morven Hills Station and became the responsibility of John and Allan McLean.

Under the terms of the license, the run was required to be stocked within a certain time and prior to an inspection from the Lands Department. The McLean's seemed to have initially been under some financial difficulty, as John supposedly deceived the inspector by moving his limited number of sheep from block to block overnight prior to the land being checked. It is possible that the yards of site **G41/5** were used for this purpose. Whether this story is true or not is difficult to say; however, by 1860, official records indicate that the station possessed 18,000 sheep, over one-tenth of the total number of sheep in the Southern District at this time (137,000). In the following years, the number of sheep in the station significantly increased, reaching 82,000 sheep by 1868, and 135,000 by 1874.

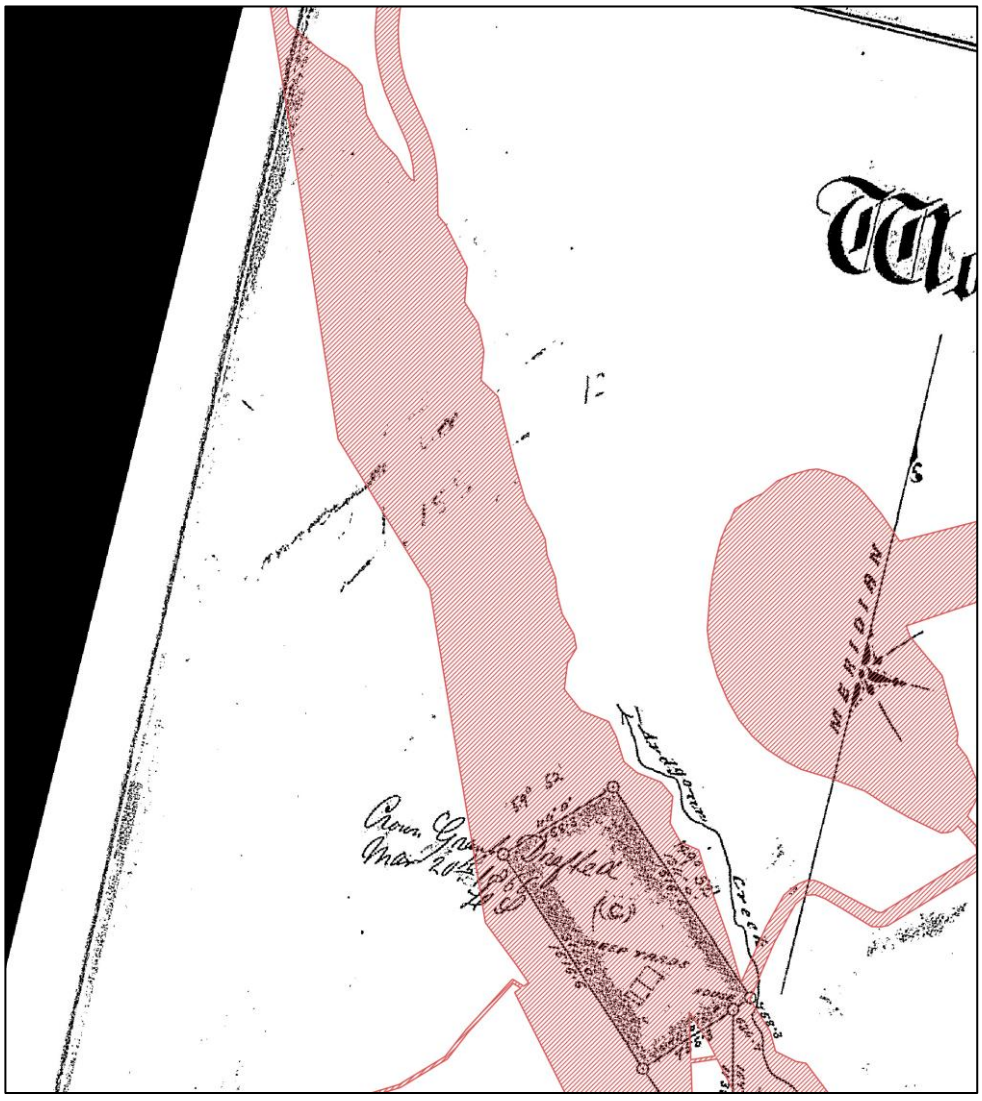


Figure 5-6. Detail of SO 16291 with relevant part of project area overlaid (red), showing area of John Mclean's pre-emptive right and associated structures. Note: Shepherds Creek is labelled as Ardgour Creek in this plan.

The entire Morven Hills Station, comprising 370,000 acres, was sold to Colonel Whitmore in 1873 and then Frederick Gonnerman Dalgerty in 1875, who also hired John Stronach as farm manager (Duff, 1978). The property was described at the time of the first sale as having 200 miles of fencing enclosing the property, a large comfortable dwelling house, two very fine wool sheds, and any other requisite for the economical and convenient working of the station (Otago Daily Times, 1873). The stone woolshed and farmstead were constructed in the Lindis Valley. Throughout this period, Cromwell had become established as a commercial centre and roads were constructed connecting it to Dunedin through the Cromwell Gorge, meaning that the Morven Hills homestead was no longer the most convenient centre for the station. Thus, various buildings throughout the station were constructed to reflect this in addition to the re-construction of the original woolshed at Breast Hill in 1890. A newspaper article from 1892 suggests that the woolshed was one of the buildings constructed to be closer to Tarras (Otago Witness, 1892), likely off Ardgour Road but outside the current project area.

5.3.3 History of The Rise and Shine (Sites G41/264, G41/265, G41/266, G41/267, G41/269, G41/273, G41/277, G41/584, G41/606, G41/658 and G41/783)

Upper Thomsons Creek was diverted for the use of many different mining companies from the mid-1860s onwards (Briden & Schmidt, 2012). The same trail over Thomsons Saddle that Māori had been using allowed for the Bendigo area to become a thriving mining settlement following the discovery of gold here in 1862 (Hamel, 1993).

The Rise and Shine Creek initially fell by the wayside for miners in the Bendigo area as it did not provide enough water for gold panning and gold itself was sparsely distributed within the valley. However, one group dominated by Swedish men from Bendigo and Rocky point, determined that the Rise and Shine area was suitable for sluicing. The group, comprising Christian Hanson, Albert Perry, Charles Abelsted, Henry Featherstone, James Pease and Donald Dryborough formed the Rise and Shine Syndicate. The group were financially successful and managed to hire a number of workers, up to 20, to work on a the construction of a water race (Carpenter, 2012).

In order to bring more water into the Rise and Shine Valley, work began in 1864 to construct the race (archaeological site **G41/584**), sourcing water from the Tipperary Creek headwaters over Thomsons Saddle. First attempts were scuppered within a few months as the water race was constructed too high, running above the winter snow levels and proving unusable in the winter months (Otago Daily Times, 1865a). As such, they started a new head race three miles south of the initial attempt. Completion of the works in November 1865 resulted in water race almost eleven miles long. A number of miners moved into the area to make use of the tail race water flowing in the Bendigo Creek once the Rise and Shine Company began sluicing, with at least 40 present in the area by the end of the month (Carpenter, 2012; Otago Daily Times, 1865b). The Rise and Shine race held 12 sluice heads of water, and two areas of the Rise and Shine Company claim was worked with sluicing guns. Extensions were made to the race in 1866 to allow for sluicing of new areas further down the valley (Otago Witness, 1866). By 1869 the company was working three areas themselves along with hired labour. As Rise and Shine Company held the full rights to the sole water source in the area, they could mine up and down the valley as they pleased (Carpenter, 2012).

As Logantown[5] grew significantly in size in 1869, the Rise and Shine Company constructed a bridle track between their workings, houses close to the claim area (potentially some or all of sites **G41/265, G41/266, G41/267, G41/273, G41/606**, **G41/658** and **G41/783**), and the new town (Carpenter, 2012). The miners of the Rise and Shine Company along with their wives and children, would however, form their own community. The surrounding area and previously worked gullies were regularly visited and prospected by single operators throughout the late 1860s and early 1870s, where they were able to make sufficient money to support themselves in areas no longer commercially viable on the company's scale (Dunstan Times, 1867; Evening Star, 1871).

[5] A historic Bendigo town west of the project area

Partway through 1871, the Rise and Shine Company hit difficult times as there was an unprecedented scarcity of water and box sluicing was taken up in response. Another drought occurred in 1873, and in order to keep working with limited water supplies they constructed a dam (site **G41/269**) at the lowest reaches of their claim, which filled overnight providing water to be used the following day (Carpenter, 2012). Records of this event (Cromwell Argus, 1873) note that this was the first time in seven years the company had had to temporarily abandon their works up the valley (those within the current project area).

Throughout the Rise and Shine Company's history, shareholders bought and sold their shares in the claim (Carpenter, 2012). In 1874 John Jones advertised his one sixth share in the water race and claim for sale, along with a four-roomed cottage "situated near the claim" (Cromwell Argus, 1874). In 1888 one of the early shareholders, Ellis Thomas, sold his one-sixth share in the Rise and Shine water right to John Ewing. Ewing convinced his fellow shareholders to sell him most of their water rights. Perhaps due to reducing returns, the deal was accepted in 1888, and the water flow was split between their Rise and Shine sluicing areas and Ewing's new claim, Tinkers (outside of the project area). The Rise and Shine men would either retire, find work elsewhere or continue in the Rise and Shine Creek, sluicing with a significantly reduced water supply. The Rise and Shine gold sluicing (site **G41/264**) was the longest running, as well as one of the largest by area, in the Otago goldfields, lasting for a total of 35 years (Carpenter, 2012, 2013b; Cromwell Argus, 1878).

There were other operators in the Rise and Shine valley beyond the Rise and Shine Company. The Eureka Syndicate, a group of investors from Bendigo, Dunedin and Cromwell, was established in 1874. They were looking to work a newly discovered reef; along the same reef line the Rise and Shine operations had worked previously. Initial yields were promising, and they leased the tailwaters of the Rise and Shine Company workings. However the Eureka Syndicate's works had ceased by 1876 as the mine (site **G41/277**) was flooded (Carpenter, 2013a, 2013b).

In 1888, a new venture commenced in the Rise and Shine valley when William Lidston, the man who would later mine at the Alta, found a new reef in this valley. Together with Charles O'Donnell, William Bennett, and W. Gilbert Mouat, they established the Jubilee Company. While cautious in spending, the company did purchase timber for the construction of a waterwheel to power a battery (Broad, 2003; Carpenter, 2013b), and within five months of the reef's discovery their battery was operating at site **G41/277**. When initially high returns dropped off, the company prospected in the area and good stone was identified above the Thomson's Saddle of a spur of Mount Moka in 1889. Moving eight tons of stone by horseback to their battery, the returns were untenable, and they abandoned this area in favour of closer reefs. In the same year the company shifted and refurbished a battery from Thomson Gorge (Carpenter, 2013b). The mine was abandoned in early 1890s, not because of low yields but because Lidston's wife had had enough of the cold and isolated Rise and Shine basin (Broad, 2003; Carpenter, 2013b).

In was not until 1932 that the Eureka mine was opened again. Frank Saxby Austin, William Cameron and George Logan, all locals, established the Bendigo Rise and Shine Company. They lived in canvas accommodations in the Rise and Shine Valley. They sunk the existing shafts at Eureka deeper, finding a rich source of gold. Lacking in funds the claim was purchased by the Otago Gold Prospecting Company in 1934 (Carpenter, 2013b). Following on with more testing they identified what was potentially the richest source of stone in Otago. By 1933, the Bendigo Rise and Shine Company had built workers huts and a four-room manager's house in the valley as shown in Figure 5-7 and Figure 5-8. The exact location of the buildings in Figure 5-7 is unknown, however Figure 5-8 was likely taken from the where the road crosses the saddle immediately south of the Rise and Shine mine and battery (**G41/277**), with the buildings themselves immediately in front of the workings recorded as part of this site. Archaeological remains of these buildings have not been specifically identified previously; however, there are numerous remains of huts, terraces and a revetted pathway in this vicinity that likely relate to these miners' residences (**G41/270**, **G41/271**, **G41/272**, **G41/273**, **G41/276**, **G41/587**, **G41/588**, **G41/603** and **G41/606**).

Lacking in funds the company only built and installed a crusher, ball mill, berdan pan, Wilfley table and a 10-horsepower motor, rather than a modern battery (Carpenter, 2013b). Eventual subsidies from the Unemployment Board enabled the company to put in an inclined tram line and the company would also install Bendigo's first ore roasting plant. By 1937 however, the Company declared that they would require more investment to get the returns from the Rise and Shine reefs and the Company ended their operations (Carpenter, 2013b).

Figure 5-7. Miners and mine huts at the Bendigo Rise and Shine Mine in 1933 ('Quartz Mining in Otago - Unemployed Strike it Rich' New Zealand Free Lance, 28 March 1934 in Carpenter, 2013b: Figure 7).

Figure 5-8. Miners' huts and manager's house at the Bendigo Rise and Shine Mine in 1933 ('Quartz Mining in Otago - Unemployed Strike it Rich' New Zealand Free Lance, 28 March 1934 in Carpenter, 2013b: Figure 8).

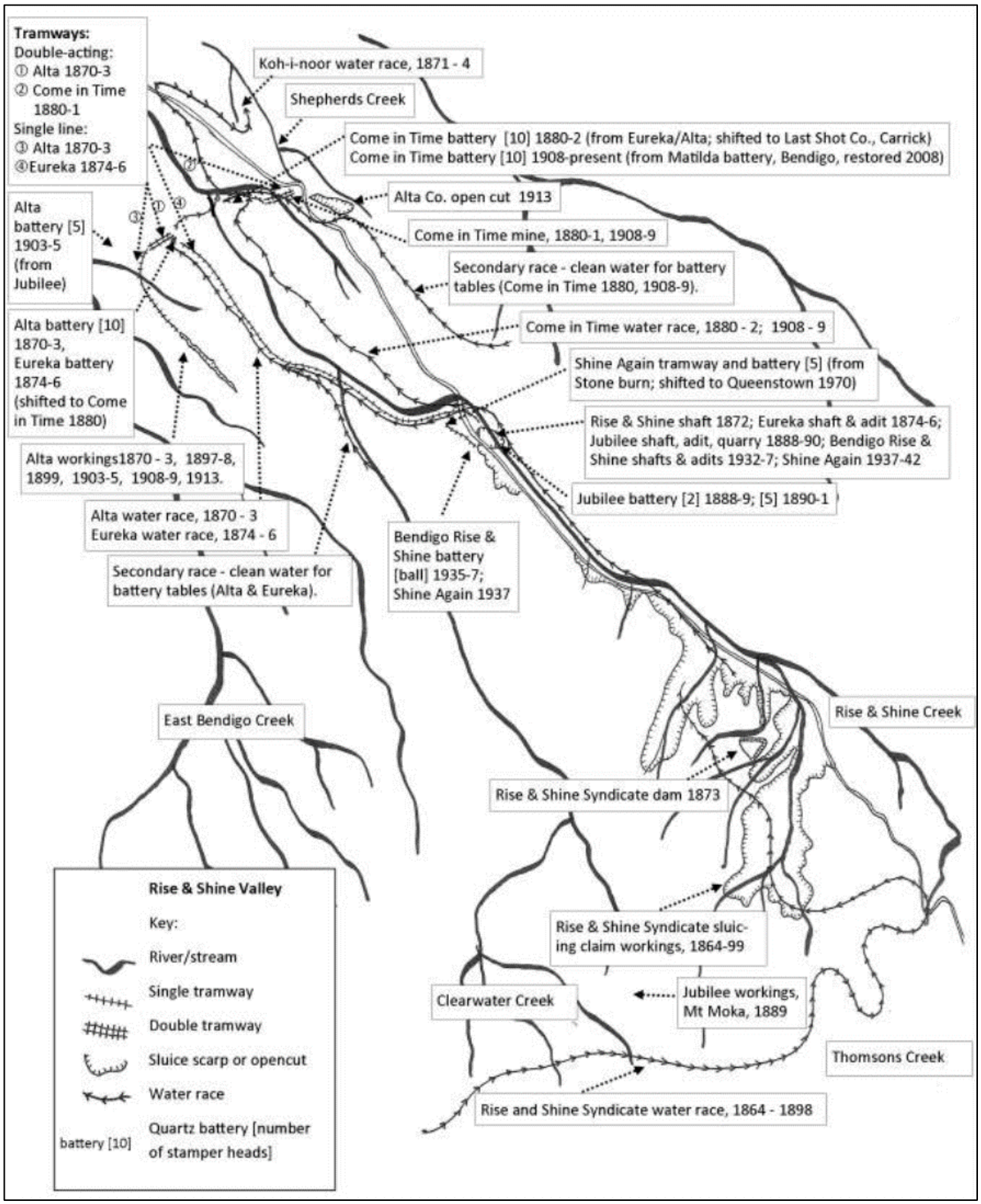


Figure 5-9 Plan of mining history in the Rise and Shine valley showing the various water races, batteries, and mines and their varying owners in the nineteenth and early twentieth centuries (Carpenter, 2013b: Figure 9).

In the same year the Shine Again Gold Mining Company was formed by a group of investors from Southland. Their initial returns from the Rise and Shine reefs were promising and a five head quartz battery was installed in 1938 enclosed in a galvanised iron structure with wooden framing. Located in the lower reaches of the Rise and Shine valley, the Company further installed a new tramline between their mine and the battery (Carpenter, 2013b).

The likely remains of the 1930s Rise and Shine Company and the Shine Again Gold Mining Company battery, and possibly the tramline, is recorded as part of **G41/277**. As the quality of the ore dropped the mine would eventually close in 1942 following the decline in a subsidy application made to the government (Carpenter, 2013b). The record of the various mining enterprises along the Rise and Shine Creek, and throughout the rest of the area was compiled by Carpenter (2013b: Figure 9) and is shown in Figure 5-9.

5.3.4 History of The Come-in-Time (Sites G41/251, G41/256, G41/586, G41/589, G41/604 and G41/605)

In mid-1880, John Kane, a Bendigo coal-carter, discovered another auriferous reef along the ridgeline between the Rise and Shine and Shepherds Creeks. As a result, the Come-in-Time mine and battery was established (site **G41/251** and potentially sites **G41/604** and/or **G41/605**). Kane and other investors purchased the Eureka Battery, relocating it to the other side of the valley, 150m beneath their adit (site **G41/251**). A double tram would run between the mine and battery. The tail-water of the Rise and Shine Company, redirected from the Alta and Eureka race, fed the Come-in-Time's water wheel and battery. To do this, a new race (site **G41/586**) was cut into the north face of the valley (Carpenter, 2013b). Another small race was also cut from Shepherd's Creek for clean water for their tables. In 1880 Kane sold his shares in the Come-in-Time to Bendigo miner William Cameron. The company should have been successful with experienced shareholders, low operating costs and good returns, yet in 1881 works at Come-in-Time ceased and the battery was sold and moved to the Carrick Range (Carpenter, 2013b).

It was not until 1908 that the Come-in-Time was opened again. Mechesidec Bospednic (Dick) Edwards and a group of local investors tested the ground and identified rich sources of gold and silver. Despite good initial testing, the venture was an economic disaster. Edwards and company obtained the old Cromwell Company machinery and shifted half of the Matilda battery from the Specimen Gully in Bendigo to the Come-in-Time site. However, the returns from the mine did not come close to investment that the shareholders had put into the Come-in-Time. The company was purchased in 1910 by J. Dunnery and M. Birley, but after a couple of months of few yields they closed the mine in the same year (Carpenter, 2013b).

When the new Alta Syndicate turned to the Come-in-Time in 1914, they focused attention on an outcrop on the Shepherds Creek side of the claim (sites **G41/604** and **G41/605**). Despite this they closed the mine the following year. The final venture into Alta and Come-in-Time was instigated by David Betts in 1933, who had leased the Come-in-Time mine (Figure 5-9). He would attempt to sell his battery to the Rise and Shine Company just a year later, but the dilapidated state of the twentieth century battery still stands at Come-in-Time today (Carpenter, 2013b).

5.3.5 History of Shepherds Creek (Sites G41/6, G41/785, G41/786, G41/787, G41/788, G41/789, G41/790 and G41/792)

There is evidence that water from Shepherds Creek was used by several different miners in the nineteenth century, including Cornelius Maher, Christian Hanssen (Hansen), Koh-i-noor syndicate, and the Cromwell Company (*Application for Water Race - Christian Hanssen - Shepherds Creek, Bendigo*, 1887; *Application for Water Race - Cornelius Maher - Shepherds Creek*, 1877). Water from Shepherds Creek was used from the late 1860s to sluice the terraces on the Clutha below the junction of the Clutha and Lindas Rivers, and in the 1870s the tail-water of the Rise and Shine Company's was rented to sluice the low-lying spurs between Shepherd's Creek and Bendigo by the Koh-i-noor syndicate (Carpenter, 2012; Cromwell Argus, 1871). In 1872 dry weather made the Koh-i-noor race ineffective as it was noted at the time "like its great namesake, its water is of the purest; but, alas! The quantity is so scant now that Mr McClean's sheep, which are being mustered in its vicinity, actually drink it all" (Cromwell Argus, 1872). There are numerous historic water races throughout the current project area, which also includes a muster point for McLean's sheep, so it is possible that the Koh-i-noor race mentioned is one of these, but as no labelled historic plans of the race were found it is not possible to positively identify which, if any, can be associated with this syndicate. The main Koh-i-noor race began just below the Alta quartz mill, which is some way from the project area, but the full length has never been confirmed, and the exact location of the syndicate's working has been unable to be pin-pointed. The Koh-i-noor continued to use their race until 1874 (Carpenter, 2013b), but

continued mining and pastoral activity in the area meant that water was a precious resource and it is likely that the race itself was used and potentially modified by later users.

It was also during the 1870s that Cornelius Maher, a well-known Bendigo and Cromwell miner put an application for a 1.5 mile race running "west by south" from Shepherds Creek (*Application for Water Race - Cornelius Maher - Shepherds Creek*, 1877; Lake County Press, 1910). Following this, a promising quartz lode was identified between Shepherd's Creek and Bendigo Gully, and a Mr Kane joined with the Cromwell Company to investigate further (Cromwell Argus, 1880b). It is unclear if the exploration of the lode was successful. Hansen and other Swedish compatriots had been mining in the Rise and Shine Valley in the 1860s, but Hansen would go on to apply for the established Cromwell Company's water race in 1887 which ran northeast and south west, thus continuing mining through the area, taking water from Shepherd's Creek (*Application for Water Race - Christian Hanssen - Shepherds Creek, Bendigo*, 1887; Carpenter, 2012; Lake County Press, 1910). This race does not appear to have passed through the project area, but this is evidence that Shepherds Creek was used on multiple occasions as the source for mining water races.

An 1898 map shows McLean's area of Pre-Emptive Rights along Shepherds Creek (containing sites G41/4 and G41/5 as discussed in Section 5.3.2) and one water race (**G41/6**) passing just to the south but no other features, including **G41/790** and **G41/792** (Figure 5-10). A geological plan drawn in 1907 records pockets of old workings on either side of Shepherds Creek, but these stop just west of the junction with Jean Creek (Figure 5-11). No evidence was found of later twentieth century mining along the portion of this creek within the project area; however, the lower reaches were the location of a relatively successful dredging operation (Hamel, 1993).

The early twentieth century also saw the construction of water races for irrigation of the Bendigo Flats. The Public Works Department constructed the large Ardgour Irrigation Scheme water race to draw water from the Lindis River to the Bendigo area to encourage the development of "orchards and intense cultivation generally" (Argus, 1916), with construction first proposed in 1914 and the system complete in 1923 (Cromwell Argus, 1914; Dunstan Times, 1923). This long window of development and the immediate improvement seen once the scheme was operational (Cromwell Argus, 1922) may have encouraged landowners and leaseholders to construct their own private irrigation races from smaller water bodies such as Shepherds Creek, and this activity may account for some of the water races that pass through the project area.

Figure 5-10. Detail of 1897 map showing Shepherds Creek (H.T.W., 1897).

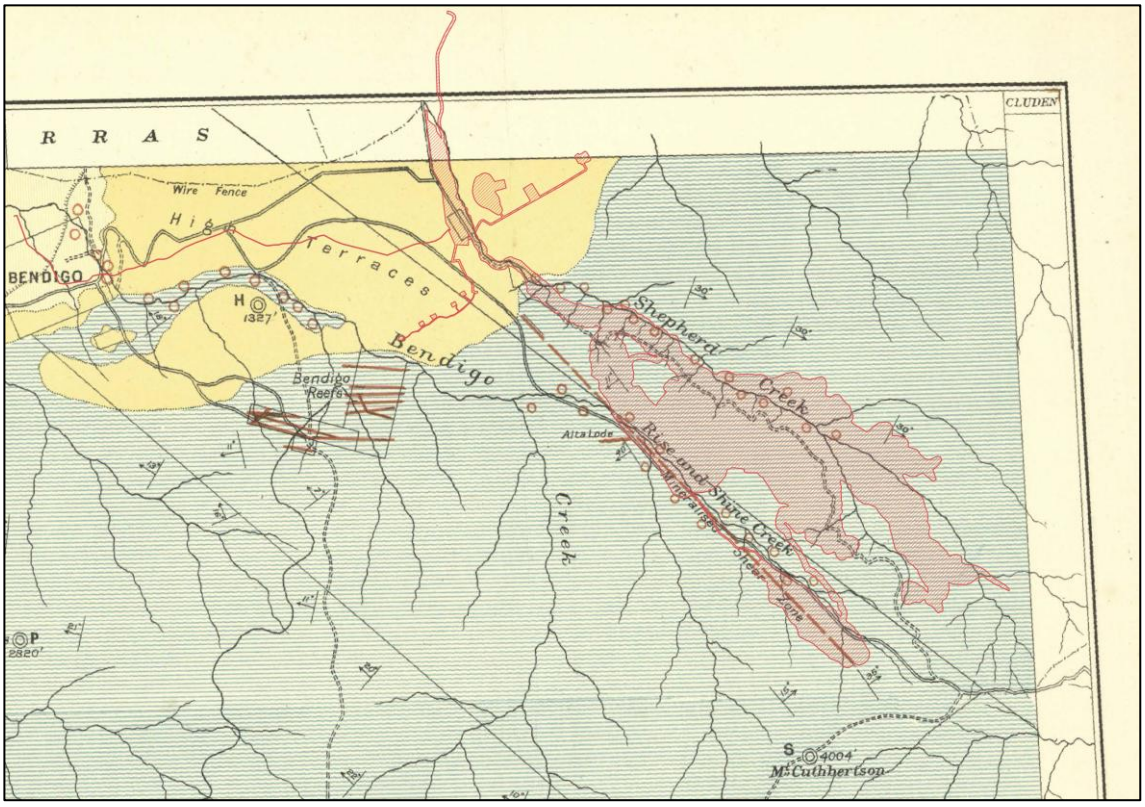


Figure 5-11. Detail of 1907 geological plan showing location of old workings (red circles) along Shepherds Creek (R. J. Crawford, 1907). The proposed project area is shown in red.

5.3.6 Matakanui-Bendigo Road (G41/782)

The Matakanui-Bendigo Road (**G41/782**) was first officially surveyed along the Shepherds Creek valley in 1898 (Figure 5-12). Historical research indicates that the idea of the Matakanui-Bendigo Road had been proposed from at least 1896, with £300 allocated for the survey of the road that year (Otago Witness, 1896). While the first official survey occurred in 1898, it was estimated the total cost of the road between the Lindis Crossing and Matakanui

would be £8742 14s, with the specific Bendigo to Matakanui portion costing £600 (Cromwell Argus, 1898). There was possibly an earlier track along this route at this time with one article stating that individuals had "travelled the road" and for the year of 1898, £600 had been allocated to the road's construction (Cromwell Argus, 1898). Further money for the road was sought by the Vincent County Council in August, 1899 (Cromwell Argus, 1899). Historical newspaper articles suggest that extensive works to form a wide track passable by more substantial transportation did not occur until after 1900. The government invested money into the construction of the road so that it was fit for dray traffic in 1902 (Dunstan Times, 1902).

The road, or an earlier track, has not been identified in historical maps; however, it is possible an earlier foot track may have run through the area. Between the CIT and RAS pits the access road presently used today aligns with the historical survey, before veering off to the northeast, down towards Shepherds Creek. It is possible that the earliest "road" along the surveyed route, was possibly nothing more than a small walkable track, passable by foot or horse. This track would have been established either soon after the 1898 survey or prior to the survey and would have guided or been incorporated into the new road alignment.

The wide road cutting into the natural hillside, and formed with culverts and revetments, is visible in the 1958 aerial photograph (Figure 5-13). However, following a large 140m revetment, the road is no longer visible and the current road, continuing downhill into Shepherds Creek, was installed after this date. The narrower track continues uphill and was formed in the last 15-20 years. It is unclear if this followed a similar earlier route. There was no evidence of stone revetments or culverts along this track. The abrupt end to the wider road, suggests that investment into the upgrade to this Matakanui-Bendigo Road stopped rather suddenly. Perhaps the Thompsons Gorge Road following the Rise and Shine Creek to the south became more important with contracts issued for portions of this road by the Vincent County Council in 1903 (Dunstan Times, 1903). By 1907 the entire Matakanui-Bendigo Road is shown as a track rather than a road in contrast with Thompson Gorge Road to the south (Figure 5-11).

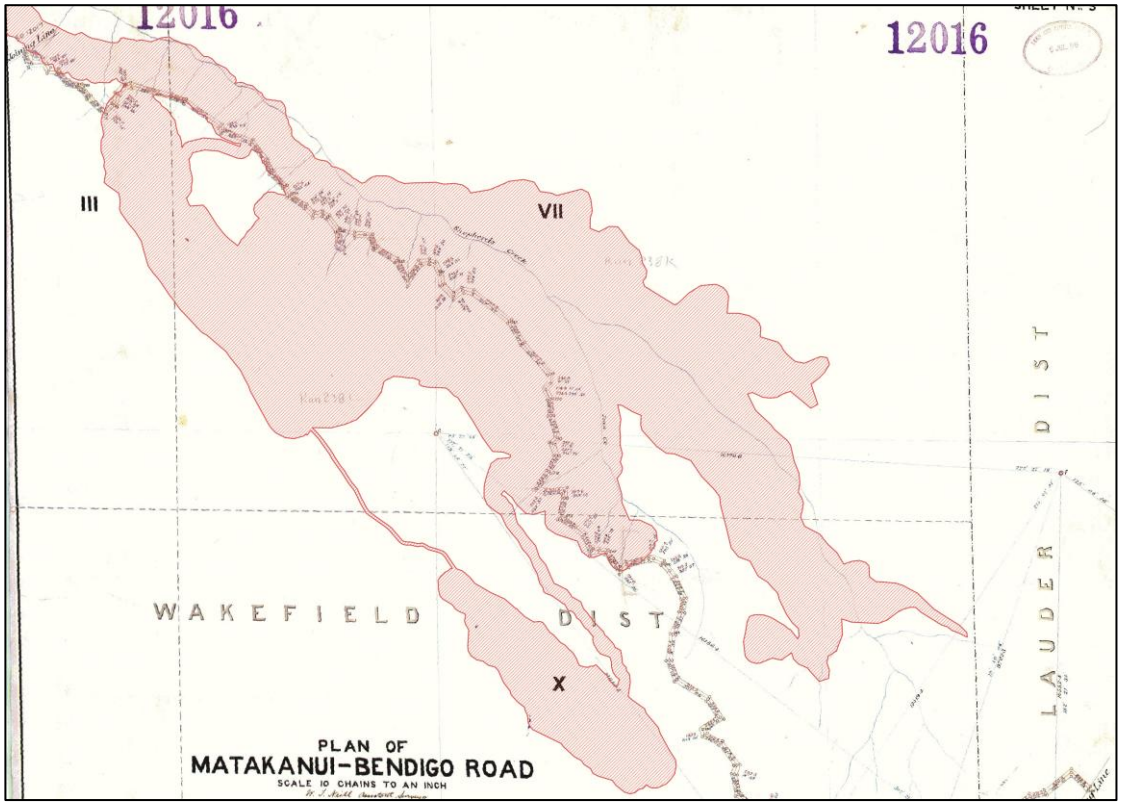


Figure 5-12. Detail of SO 12016 (1898) shown the first survey of the Matakanui-Bendigo Road along Shepherds and Jean Creek. The proposed project area has been overlaid in red.

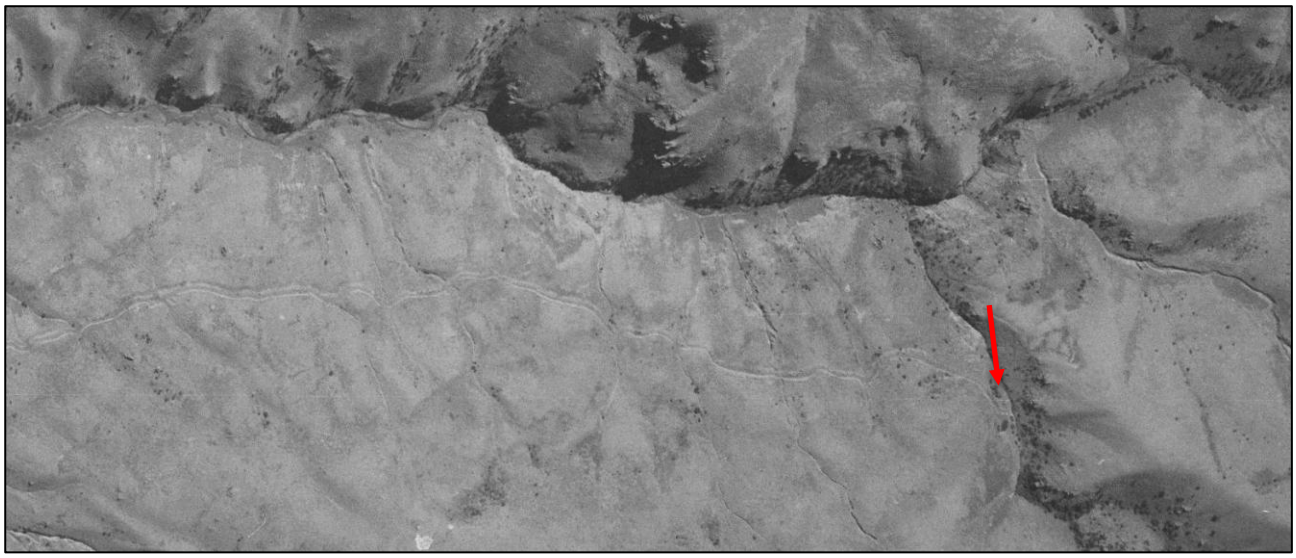


Figure 5-13. Aerial photograph from 1958 showing the Matakanui- Bendigo Road (Retrolens, 2021). Note that following the main stone revetment (red arrow) the wide road is no longer visible.

5.3.7 Thompsons Gorge Road Reserve

An official road through along the Rise and Shine Creek valley was not established prior to 1900. It was not until 1975 that a dry weather route over Thomsons Saddle (the current Thompsons Gorge Road) was established by Vincent County Council and Matakanui Station (Otago Goldfields Heritage, 2004). However, a "gorge track" was in constant use through the area. A 1909 plan shows a "Rise and Shine Track" running alongside the Rise and Shine Creek long before this designated road was established (Figure 5-14). The track follows a similar course to the present-day Thomsons Gorge Road although the track and later road only overlap at two distinct points: the Thomsons Gorge Saddle and a small saddle located where the present road runs northwest, away from the Rise and Shine Creek. This plan shows the potential pre-1900 track passes just to the north of the current project area. In contrast the current 4WD track to the top of Mt Moka, follows the same alignment as a 1909 "Pack Track" throughout the southern extent of the survey area. Both tracks likely pre-date 1900 as what is likely the same "pack track" is visible in an 1876 plan (Figure 5-15) running up to the small saddle where it intersects with the present-day road. Another road to Bendigo is shown on this plan from this point north. It does not align with current Thomsons Gorge Road, or the rest of the track shown in the 1909 plan. However, this may be a result of the plan being less geographically accurate that those succeeding it.

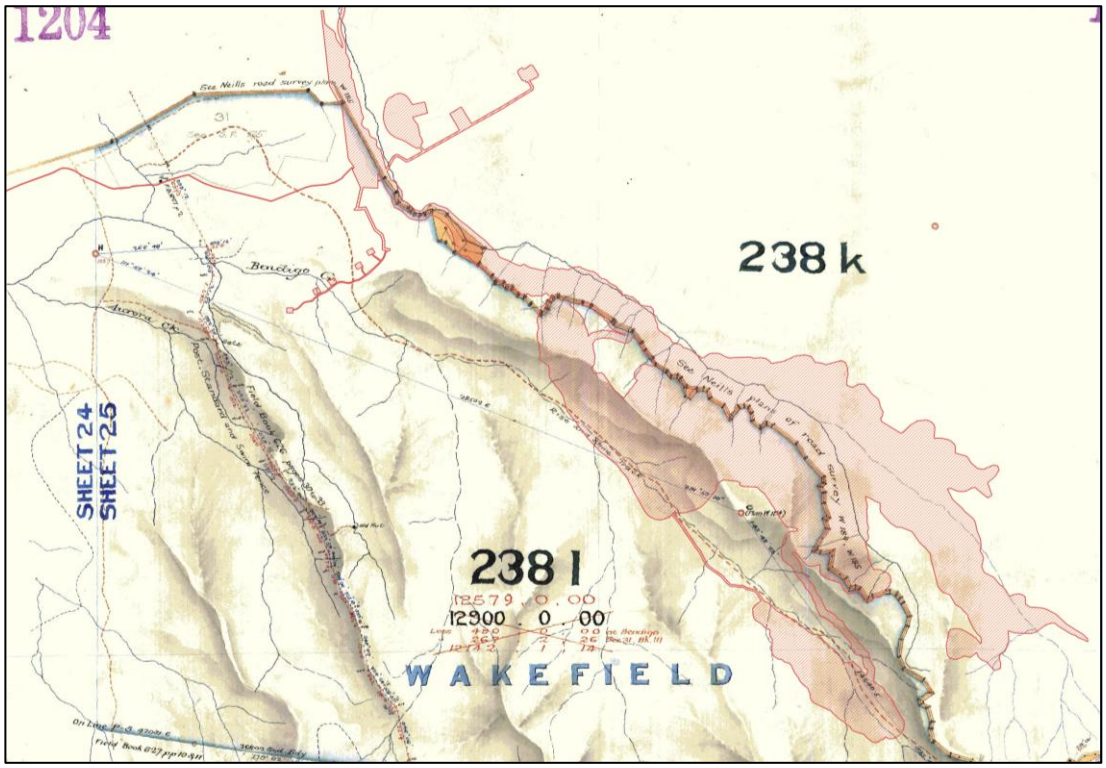


Figure 5-14. Survey plan SO 1204 (1909) showing likely pre-1900 tracks (dotted brown line). The proposed project area is overlaid in red.

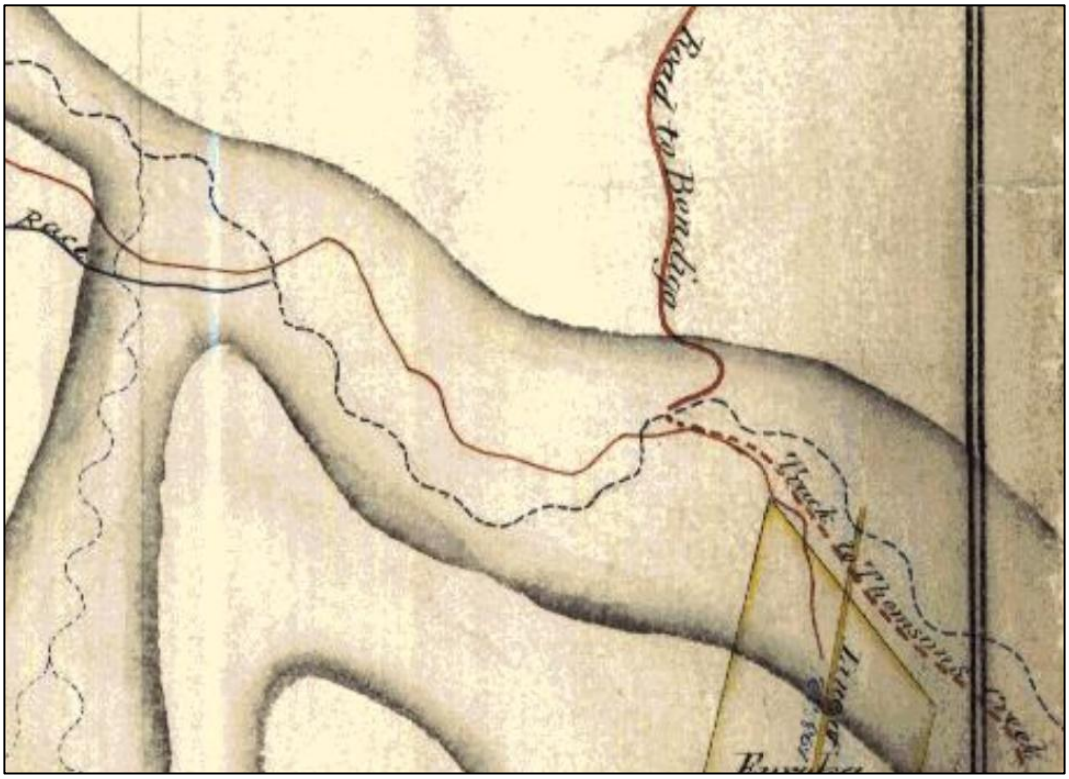


Figure 5-15. Survey plan SO 2086 (1876) showing likely track to Thomsons Creek (dotted brown line).

5.3.8 Late Twentieth Century Mining and Farming Activity in the Project Area

There have been several modern mining explorations over the Bendigo-Ophir project area since the 1980s. This work has focused on the Bendigo and Rise & Shine goldfields which have been recognised as similar to the successful Macraes gold mining deposit. Both Bendigo-Ophir and Macraes have gold concentrations and prospects within bedrock metamorphic schist. These prospects occur in multiple north-west and south-east trending shear

zones that extend intermittently for 30km in strike length (pers. comm Kim Bunting, Matakanui Gold Ltd.). Thus, exploration has concentrated along the known shear zones as is shown in Figure 5-16. The exploration works have involved surface or underground data collection using soil, rock, stream-sediment sampling, pitting, trenching and drilling. This has been done using both hand (minimum impact activities) and mechanical (non-minimum-impact) methods (pers. comm Kim Bunting, Matakanui Gold Ltd.).

Modern farming activity throughout the project area has included installation of fences, clearance of vegetation by bulldozer, and track formation. Most of these activities have been conducted on an as needed basis and so detailed plans are not available; however, the physical traces of these activities are relatively easy to distinguish from heritage features through the use of modern materials (for fencing), the absence of the features in historical aerials, or the distinctive and uniform nature of the evidence (for example the circular mounds of vegetation and topsoil created by bulldozers). Specific modifications by modern mining and farming activities to heritage sites has been specifically addressed for each site in Sections 6.1 and 7 below.

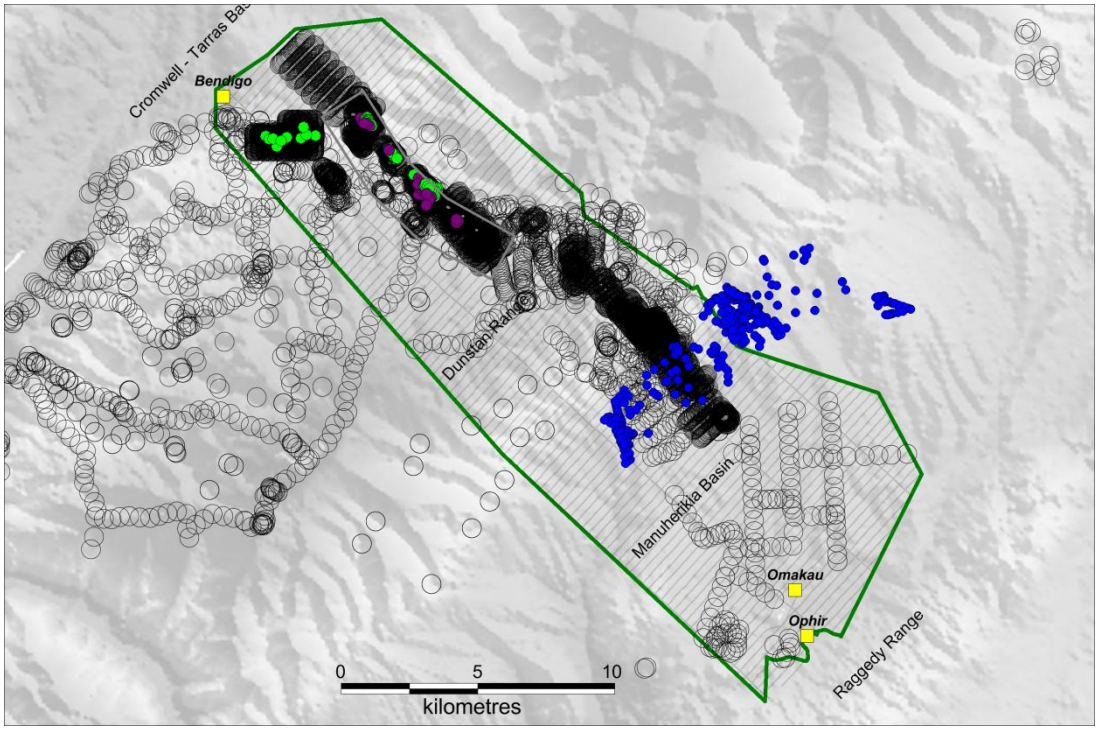


Figure 5-16. Recorded exploration sites throughout the Bendigo-Ophir Project Area Minerals Exploration Permit 60311 (outlined green) as of 2019, classified by exploration method: hand (open black circles) and mechanical (other colours) (Source: Kim Bunting, Matakanui Gold Ltd.). the current project area is located close to the purple circles.

5.3.9 Summary

The history of the survey area spans from pre-European Māori activity to nineteenth and twentieth century farming and gold mining activities. Farming across the survey area has continued uninterrupted to this day, while gold mining exploration has continued sporadically in the later 1900s and 2000s. Gold mining, however, has resulted in the most intensive and complex use of the landscape. Multiple mining syndicates and companies mine the various gold bearing reefs constructing new, and often recycling older, mines, batteries, water races and tramways from the 1860s through until the 1940s. This mining activity has followed the mining cycle and continues to present-day with current exploration activities.

6 Previous Investigations and Heritage Context

The following section provides a background to the heritage context of the project area. This includes consideration of previous research into the project area, recorded archaeological and heritage sites in the wider area, and relevant site types in the archaeological record. This includes gold mining, domestic occupation and transport/communication sites.

6.1 Previous Research and Investigations within the Project Area

There are 18 previously recorded heritage sites within the project area, as well as part of one historic area listed on the New Zealand Heritage List/Rārangi Kōrero (Figure 6-1). Recorded sites up and down the Rise and Shine Creek valley are associated with mining activity by the several large-scale syndicates as well as individual miners.

A number of previous archaeological surveys have been undertaken of the Rise and Shine and surrounding valleys. Each survey has contributed to the 18 archaeological sites previously recorded in the project area as shown in Table 6-1. Several sites were recorded in the north of the project area in 1977 by Newman and Croad, but this appears to have been limited to the most obvious and accessible sites and features. The earliest systematic site survey across the Bendigo area was undertaken by Jacomb and Easdale in 1980. Their survey contributed to the earliest archaeological site record forms (SRFs) for many of the archaeological sites within the project area.

Following this was Jill Hamel's 1990 survey undertaken on behalf of the DoC for a report on the heritage sites within Bendigo Station as part of the implementation of the Protected Natural Areas Programme (Hamel, 1993). The results of Hamel's work were not added to the site record forms, but her report describes most features identified and recorded during the 1980 survey as in a similar condition.

Reg Nichol and Les Wright (2006) undertook a survey in 2005 that focused on accurately defining the extent of recorded sites around the Rise and Shine Creek. A number of previously recorded stone huts and structures were not relocated by Nichol and Wright (2006); however, numerous mining sites were relocated. GPS coordinates for all relocated sites were added to the site record forms. Nichol and Wright worked from Hamel's 1993 maps and added these to the site record forms where relevant. While their primary goal was not to locate unrecorded sites due to time constraints, they still recorded twenty new sites. New sites identified included water races, a dam, occupation terraces and debris, roads and tracks, stone huts, a battery and mine workings. Nichol and Wright did not explicitly address site or landscape values in their report.

In 2011 Matt Schmidt and Shar Briden (2012) undertook a survey of the Matakanui Pastoral Lease (Run 238). They focussed on the Thomsons Creek valley and Thomsons saddle area and did not revisit the current project area. However, they did record large sections of the Rise and Shine Water Race (G41/584). Schmidt and Briden were able to locate the first attempted Rise and Shine Race, abandoned as it was too high and prone to freezing, as well as the point at which the successful race was diverted from Thomsons Creek, marked by stone revetments. Though they did not follow the race for the full 11 miles to the sluicings within the current project area, they recorded the section closer to the saddle and Mt Moka, noting the race measured 1.2m wide and 0.35m deep and had been damaged in areas by erosion and gravel removal close to the road. Another site identified during this survey was a large oval pit on a terrace beside Thomsons Creek, which was tentatively interpreted as a possible Māori umu; however, this sits outside of the current project area and no other archaeological features associated with manawhenua occupation were identified on any of the surveys. This should not be taken as evidence that manawhenua were not active users of the landscape, as we know a well-trafficked ara tawhito passed through here, and there were likely Māori miners involved in later activities.

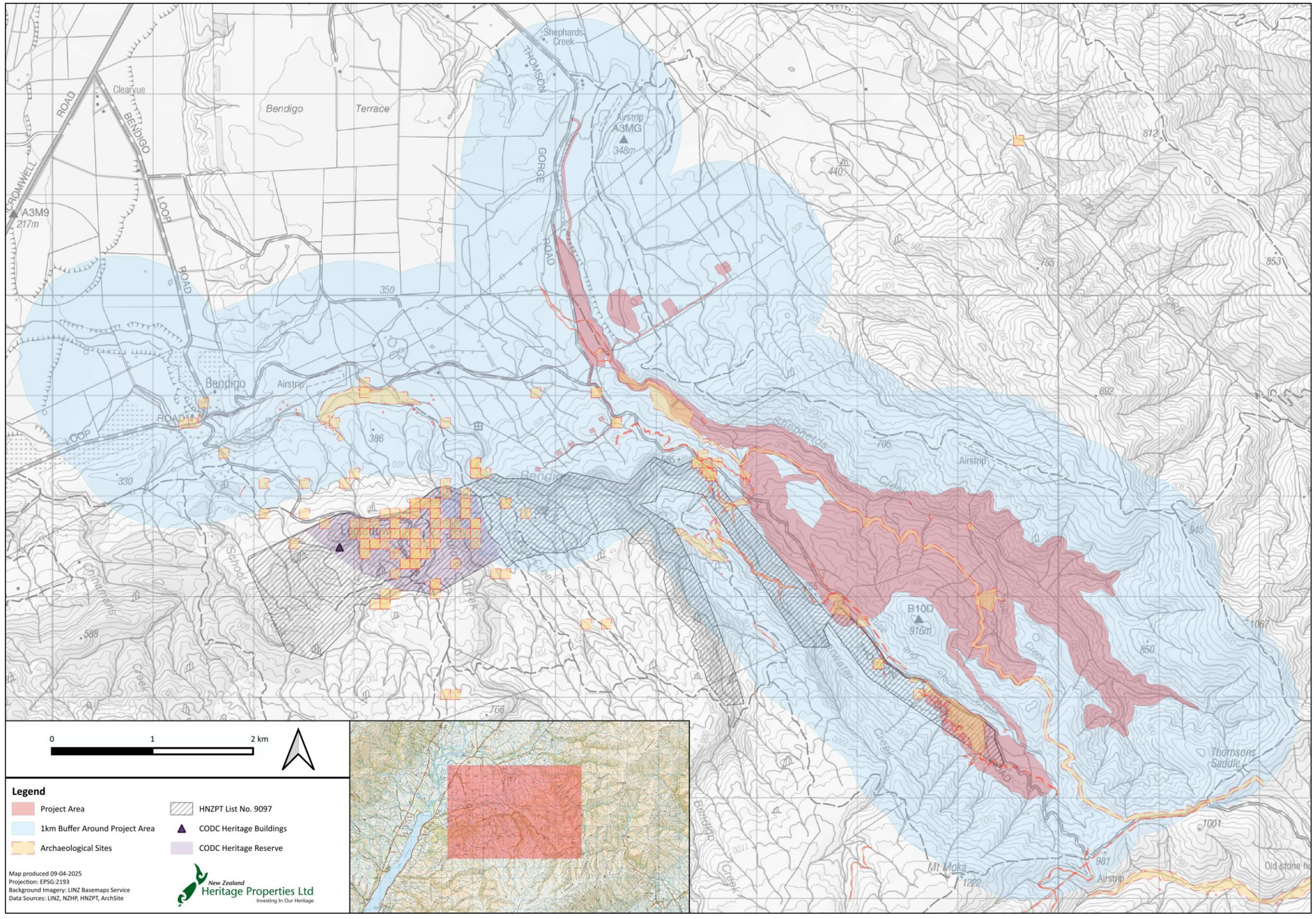


Figure 6-1. Distribution of recorded heritage sites within the BOGP project area and the wider landscape.

Lloyd Carpenter undertook detailed historical research into the Bendigo and Rise and Shine areas as part of his PhD thesis (Carpenter, 2012, 2013b, 2013a). Carpenter's work focussed on the human experience of the landscape through the nineteenth century gold rushes and provides an invaluable resource for understanding the heritage values of the area. Carpenter consulted a huge range of primary and secondary sources, including through the Otago and Wellington Archives New Zealand branches, Land Information New Zealand, all local museums and archives in Central Otago, online historical newspaper repositories from New Zealand and Australia, the Appendices to the House of Representatives and a comprehensive list of published histories of the area and the mining industry. He frames the wider Bendigo and Rise and Shine Creek as an exemplary example of a mining landscape, with over nine decades (at the time of his research) of more or less continuous activity. However, he does argue that the current management of the historic resources focuses on the romantic nature of the ruins at the expense of other vital components of the lived landscape such as the names and characters of individuals, and the sounds, smells and more ephemeral landscape modifications such as gardens.

Finally Peter Petchey (2013) visited the extant Come-in-Time and Alta batteries for his PhD thesis research. He also examined the machinery that once was used at the Rise and Shine Mine. The machinery has been removed from this site and has been split between the Kawarau Gorge Mining Centre and Bendigo Station.

Table 6-1. Previously recorded sites throughout the project area.

Site number	Site Type	Site Description	NZTM Co-Ordinates
G41/4	Pastoral/agricultural	Stone Hut	E1315455, N 5019381
G41/5	Pastoral/agricultural	Stoen stockyards	E1315425, N5019447
G41/251	Mining – Gold	Come-in-Time battery – 10-stamper battery, two adits, mullock, track, wall, and possible ore bin	E1316750, N5017894
G41/264	Mining – Gold	Gold workings, water race, dam, adit, breastwork, tailings, terrace and sluice faces	E1319112, N5015622
G41/265	Historic – Domestic	Stone hut	E1319254, N5015706
G41/266	Historic – Domestic	Stone hut	E1319277, N5015530
G41/267	Historic – Domestic	Stone hut with chimney	E1319258, N5015500
G41/269	Mining – Gold	Dam 10 m wide	E1319033, N5015744
G41/273	Historic – Domestic	Stone hut	E1318232, N5016439
G41/277	Mining – Gold	Rise and Shine mine and battery – Mine and battery site, adits, sluicing face, spoil, machine foundations, dam, stone faced terrace (possible dam)	E1317748, N5016974
G41/310	Mining-Gold	Area of gold workings	E1313254, N5018878
G41/584	Industrial	Water race	E1319581, N5015301
G41/586	Industrial	Water race	E1316416, N5018361
G41/587	Mining-gold	Terraces	E1318051, N5016637
G41/588	Unclassified	European artefacts	E1317999, N5016701
G41/589	Transport/ Communication	Revetted road	E1316977, N5017871
G41/604	Mining – Gold	Turbine and battery	E1316877, N5018231
G41/605	Mining – Gold	Mine	E1316937, N5018011
G41/606	Historic – Domestic	Stone hut	E1318249, N5016411

6.1.1 Bendigo Quartz Reefs Historic Area

Part of the project area is included in the Bendigo Quartz Reefs Historic Area (List No. 9097 on the New Zealand Heritage List/Rārangi Kōrero; Figure 6-2). The listed area comprises a group of inter-related historic places including the Rise and Shine claims, the Come-in-Time battery, and associated archaeological sites. This List entry includes Secs 10, 21, 25, 31 SO 24641, Sec 32 Blk III Wakefield SD, part of Sec 12 SO 24641 (CT 41767), and part of the land described as Legal Road, Otago Land District (Figure 6-2). This historic area has been recognised for its wealth of sites which represent the full spectrum of local mining methods, associated infrastructure, and time periods. As Figure 6-2 shows, the current project area comprises a small and the most remote portion of this historic area. A brief overview of the history of this area[6] is presented here. This historic area was a nexus for multiple methods of gold mining from the 1860s through to at least the 1930s. Good examples of alluvial, sluicing

[6] This section is summarised from the Bendigo Quartz Reefs Historic Area Listing report (Bauchop, 2015).

and quartz mining features representing a range of technologies can be found across the area, as well as mining townships and more isolated hut and house sites.

The Bendigo Quartz Reefs historic area includes the mining settlements of Logantown, Welshtown, and Bendigo, and the Bendigo Reefs, Rise and Shine and Come in Time claims, as well as associated infrastructure. The Rise and Shine claim is the only part of the historic area that falls within the current project area. The nature of mining activities in this area changed through time, with the earliest miners favouring alluvial mining, with the exception of the Rise and Shine company who began sluicing their claim in the 1860s. Sluicing required water and tail races, and these races enabled smaller scale mining to take place further down the Bendigo reefs. By 1866, the initial gold rush was over as most of the alluvial gold had been retrieved, and the focus shifted to quartz mining. This shift saw a move from individuals and small groups of miners to large syndicates dues to the need for considerable capital to establish operations, and the first few syndicates failed to make the reefs profitable.

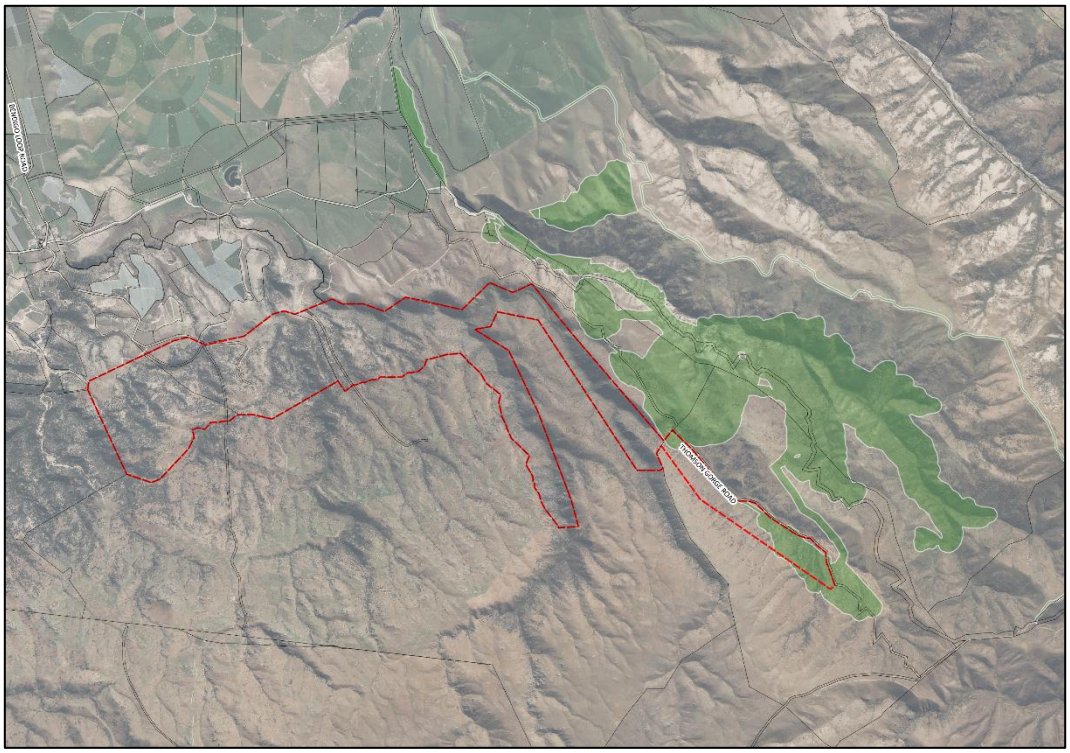


Figure 6-2. Extent of Bendigo Quartz Reefs Historic Area outlined in red, with total BOGP project area shown in green.

The Cromwell Quartz Mining Company were one of the first successful quartz syndicates at Bendigo, and by 1870 there was a second influx of prospectors. The growing reputation of the area encouraged the development of Logantown and Welshtown, the latter of which entirely consisted of Cromwell Mining Company employees and their families by 1871. Welshtown was the centre of an historic miner's strike in 1881, when the Cromwell Company laid off 40 staff and reduced the wages paid to the remaining employees, resulting in many of the town's occupants forced to move elsewhere and heightened tensions between the company and the locals that would eventually contribute to the end of the Cromwell Company which entered receivership in 1884. While this activity was taking place around Bendigo, the Rise and Shine Company and its successors were still sluicing the upper reaches of the Rise and Shine Creek with some success until the 1890s.

Multiple efforts were made to reestablish a quartz mine at Bendigo in the late nineteenth and early twentieth century, but none were successful and the occupants of Bendigo, Welshtown, and Logantown moved on, taking all but the stone portions of their buildings with them. The last major effort was undertaken in the 1930s utilising unemployed labour, with batteries erected on previously worked areas around Bendigo, the Come in Time area and the Rise and Shine Creek.

6.1.2 Site G41/4 (Rabbiter's Hut)

The stone hut at site G41/4 was first recorded in 1977 by Newman and Croad. The site record form (SRF) describes it as comprising "split schist and concrete mortar and corrugated iron roof" with a chimney on the south end. They further note, but do not provide sources, that it was a shepherd's cottage on Morven Hills station and around 100 years old. The use of concrete mortar would be unusual for a hut of this age; however, this hut has clearly been kept in use and may have been re-pointed later. The hut was revisited by Hamel in 1990 and described it in more detail. The gables measured 3m tall and the door and window were intact, but the window had no glass. Hamel (1993) agrees with the previous interpretation of the hut as a shepherd's hut owing to its close proximity to a set of stone stock yards (G41/5), and likely associated with the Morven Hills period due to the similarities in style with the other buildings and structures nearby known to be constructed during that time. Hamel did not include photographs of the hut in her report but did create a sketch map of the hut and yard complex (Figure 6-3). No further investigations have been undertaken at this site.

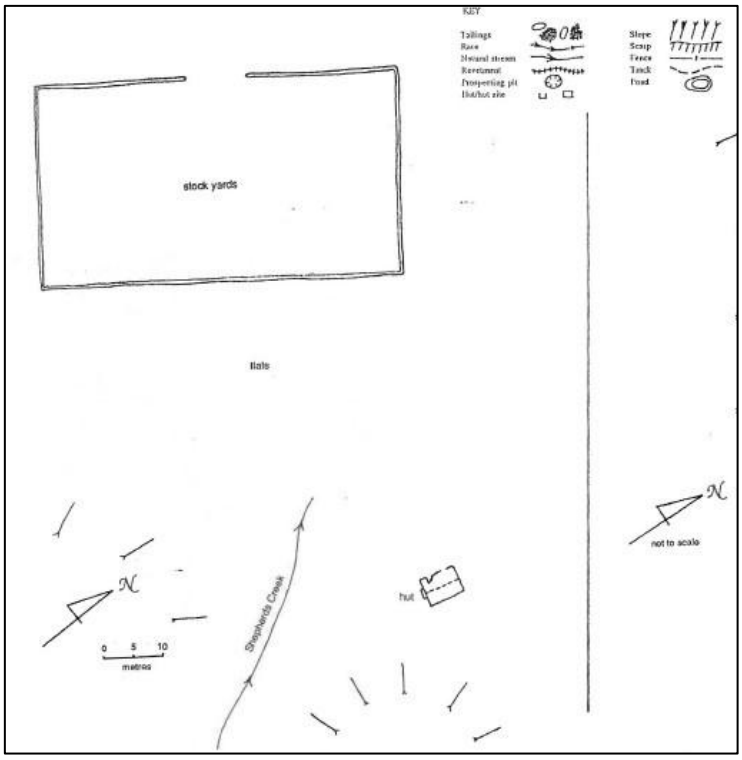


Figure 6-3. Sketch map of G41/4 (bottom centre) in context with G41/5 stock yards (Hamel, 1993).

6.1.3 Sie G41/5 (Stock Yards)

Site G41/5 was first recorded in 1977 by Newman and Croad. The initial site record form describes the site as consisting of dry stacked split schist yards with one 5m wide entrance on the north side. Some potential internal division was identified in the form of a single line of stones across the centre. The walls were 1m wide and up to 0.5m tall. Hamel (1993) describes the stockyards as "a simple rectangle of Galloway double dyke walling, enclosing a space 34 x 60m with one 10m entrance on the north side". The entrance at this date had been widened considerably from the initial description, possibly as a result of stone robbing. Hamel notes they are similar to another set of Morven Hills Station yards (G40/33) that had been destroyed by the time of her survey, and interpreted them as mustering yards.

6.1.4 Site G41/6 (Water Race)

Site G41/6 was first recorded in 1977 by Newman and Croad. The original site record form describes the race as appearing to run from "somewhere up Shepherds Creek" to the west along the base of a scarp close to G41/4 and G41/5. The feature was noted as in good condition, but no photographs or sketches were included in the record. Hamel revisited the race in her 1990 survey and described it, along with a second race on the opposite side of the

creek, as still carrying water and associated with an earth dam (location not described). Hamel (1993) hypothesised that G41/6 could have provided water for the hut and yards or mining, but that the heavy ploughing downstream had destroyed any evidence of such activity. No photographs or sketches accompanied these descriptions.

6.1.5 Site G41/251 (Come-in-Time Battery)

Site G41/251 was first recorded by Jacomb and Easdale in 1980. Their initial SRF, which includes a sketch plan, records a wide range of features including a partially intact 10 stamper battery, sections of stone wall, water races, mine shafts, tracks and tailings. Hamel (1993) visited the site in 1990 but did not add much in the way of detail to the site description, only adding that she felt the bay in the hillside mentioned by Jacomb and Easdale was more likely a collapsed tunnel and potentially links some of the revetted paths to John Kane's 1880s double tramway. The site was revisited in 2005 by Nichol and Wright who added GPS coordinates for the site's main features and reinterpreted the "bay" in the hillside as a potential bin site and the adit at the northeast end of the site as an abandoned tunnel that was intended to connect with the other side of the ridge (sites G41/604 and G41/605) (Nichol & Wright, 2006). This site also records the western ends of two water races recorded in Carpenter's (2013b) plan: the Come-in-Time water race and a secondary race used to access clean water for battery tables (Figure 5-9 and Figure 7-22). The Come-in-Time water race continues further south towards the Rise and Shine mine and battery (G41/277). Both water races were used prior to and after 1900.

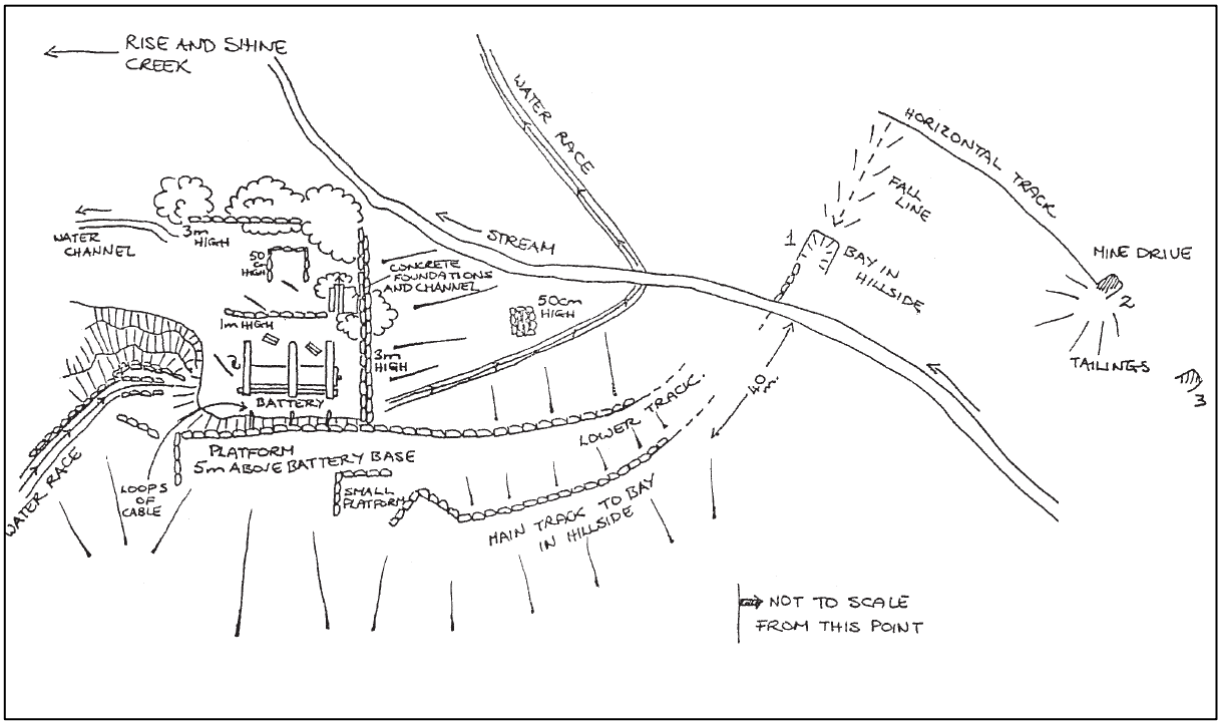


Figure 6-4 Plan of the Come-in-Time battery developed from Jacomb and Easdale's 1980 survey (Hamel, 1993: Figure 21).

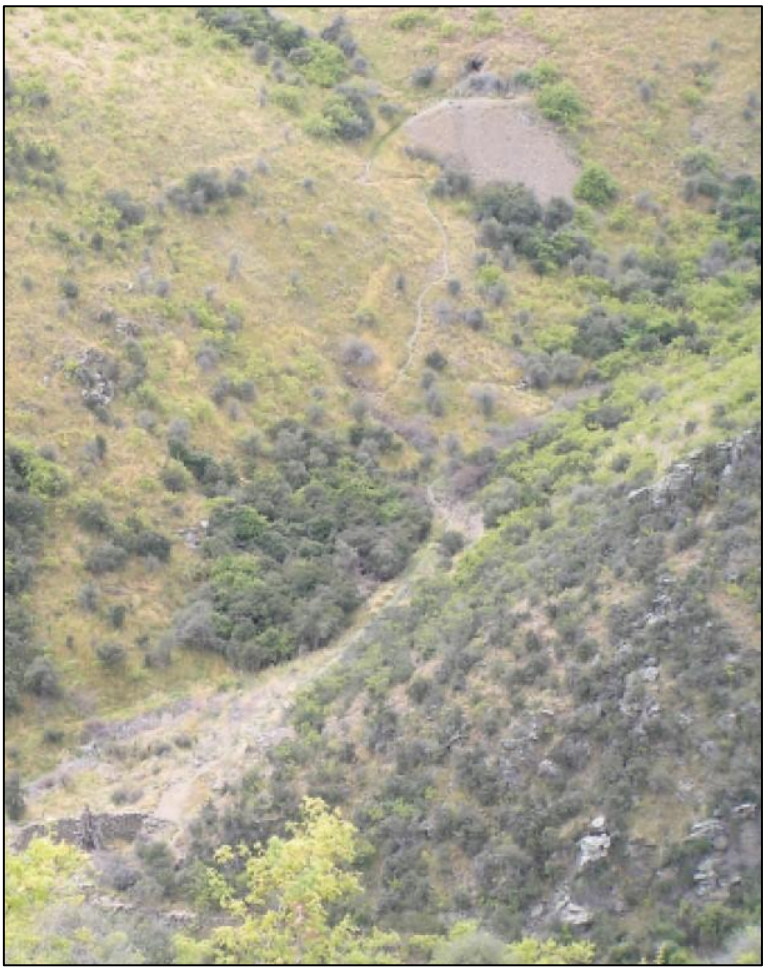


Figure 6-5. Site G41/251 in 2005, looking east with stamper battery at bottom left and adit at top of image (Nichol & Wright, 2006).

Later in 2005 restoration works were undertaken on the battery under Archaeological Authority 2006/054, including the installation of a replacement Pelton wheel and replacement of rotten timbers, but this authority was not relevant for the portion of the site that falls within the current project area. In 2010 more restoration works occurred here under the same authority, this time on the stone walls surrounding the battery (Middlemiss, 2011).

Figure 6-6. Restoration of the stone walls adjacent to the Come-in-Time battery (Middlemiss, 2011).

6.1.6 Site G41/256 (Gold workings)

The SRF for G41/256, first recorded by Jacomb & Easdale in 1980, records a damaged earth dam, water race and patches of tailings. No photographs or sketches accompanied this description. Hamel (1993) revisited the site in her 1990 survey and described it as comprising a reservoir on the saddle between two small gullies, with an earth wall 1m high and 2m wide, fed by a water race coming in from the north.

6.1.7 Site G41/264 (Rise and Shine Gold Workings)

The SRF for G41/264, first recorded by Jacomb and Easdale in 1980, records a large area of alluvial workings along the Rise and Shine Creek (Figure 6-7 and Figure 6-8), predominantly associated with the 1860s operations of the Rise and Shine Syndicate. The features of the site include small tailings mounds scattered across the alluvial flats, some with revetted channelling, and sluicing in the gullies run down towards the creek. The site was first recorded by Jacomb and Easdale in 1980. Later additions to the SRF by Nichol and Wright (2006) included two dams, barrel hoops, a collapsed adit, tailings and sluicing areas. There have been modern mining works undertaken throughout this site including root raking, drill holes, trenching and pitting from the mid-1980s through into the twenty-first century. These works have likely modified and damaged the site. In spite of this, given the extent of the site, many features remain intact.

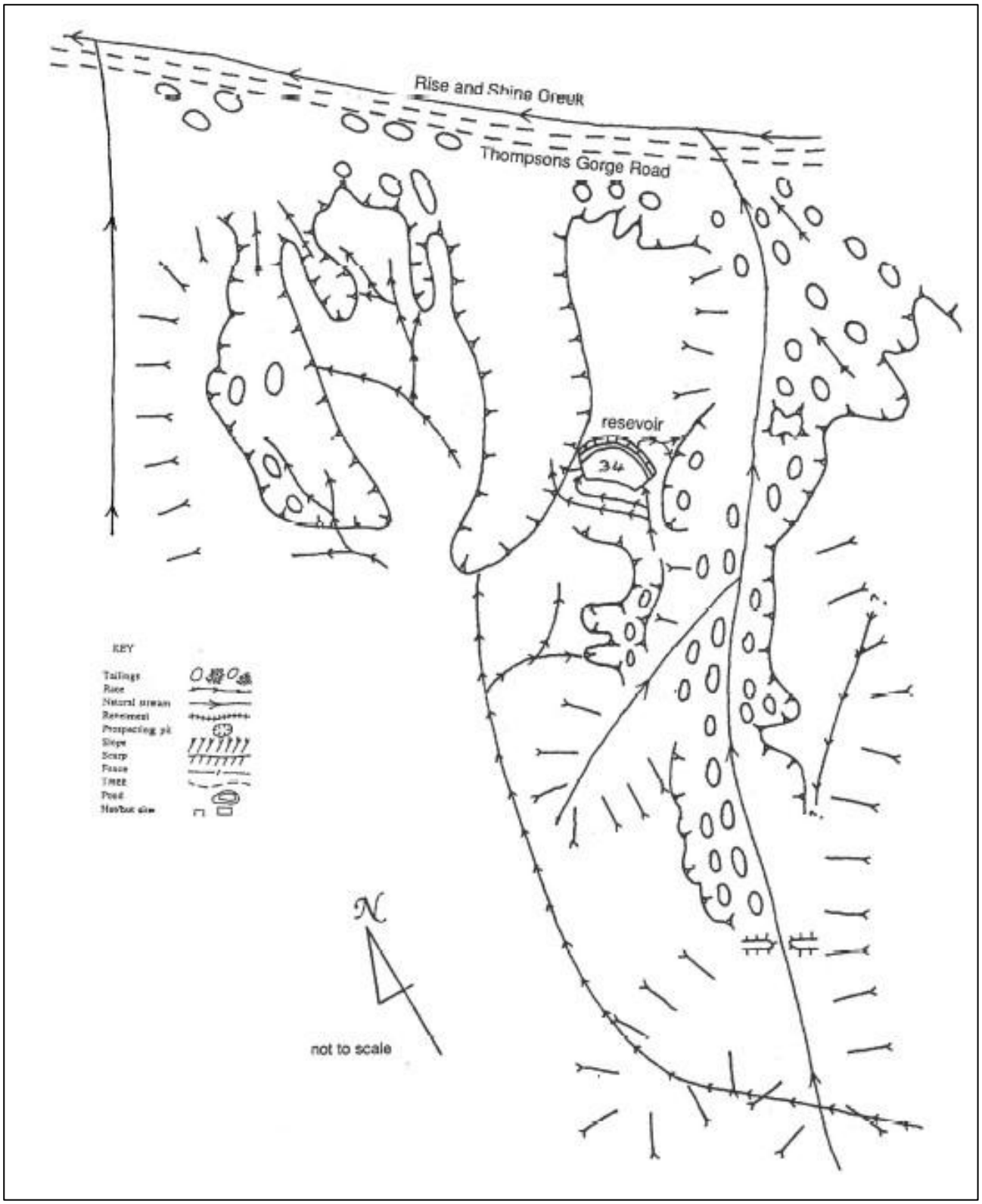


Figure 6-7. Sketch map of western half of G41/264 and G41/269 (labelled "reservoir") created following 1990 survey (Hamel, 1993).

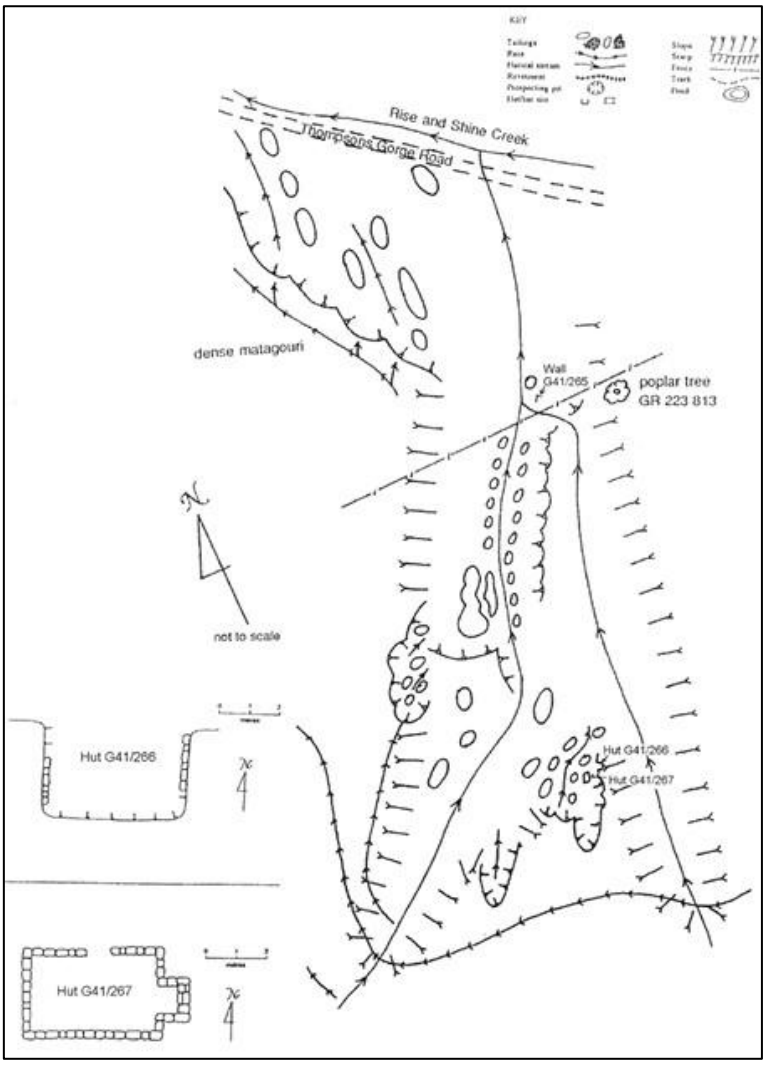


Figure 6-8. Sketch plan of eastern half of G41/264 and associated sites created following 1993 survey (Hamel, 1993) and updated with site numbers in 2005.

6.1.8 Site G41/265, G41/266 and G41/267 (Stone Huts)

Stone huts G41/265, G41/266 and G41/267 were first recorded by Jacomb and Easdale in 1980 and are discussed together due to their close proximity. Sketch maps were drawn of each structure (Figure 6-9, Figure 6-10 and Figure 6-11), with one (G41/265) noted to have been partially disturbed by a modern fence line, with schist stones from the walls pushed aside to clear a path for this feature. Jill Hamel revisited all three stone huts in 1990 and noted that G41/266 and G41/267 were being rapidly enveloped by matagouri scrub (Figure 6-12). Nichol and Wright relocated all three huts during their 2005 survey, noting that the structures remained in a stable condition but that the vegetation was continuing to take over (Figure 6-13 and Figure 6-14), especially for site G41/267 which could not be photographed clearly due to the heavy scrub (Nichol & Wright, 2006).

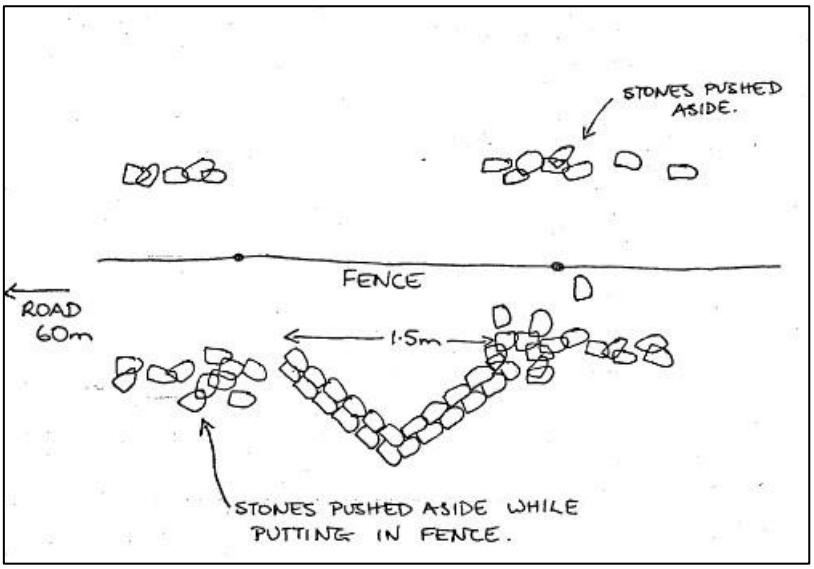


Figure 6-9. Sketch map of G41/265 from 1980 site record form.

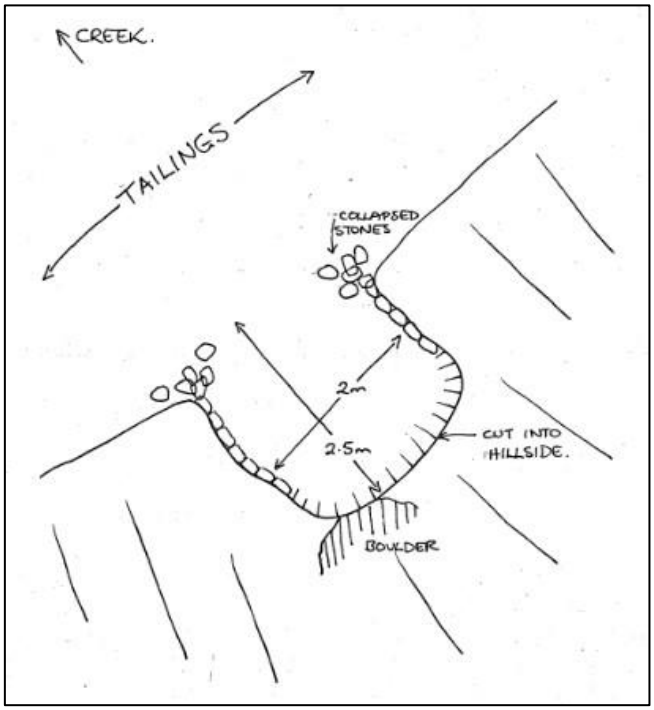


Figure 6-10. Sketch plan of G41/266 from 1980 site record form.

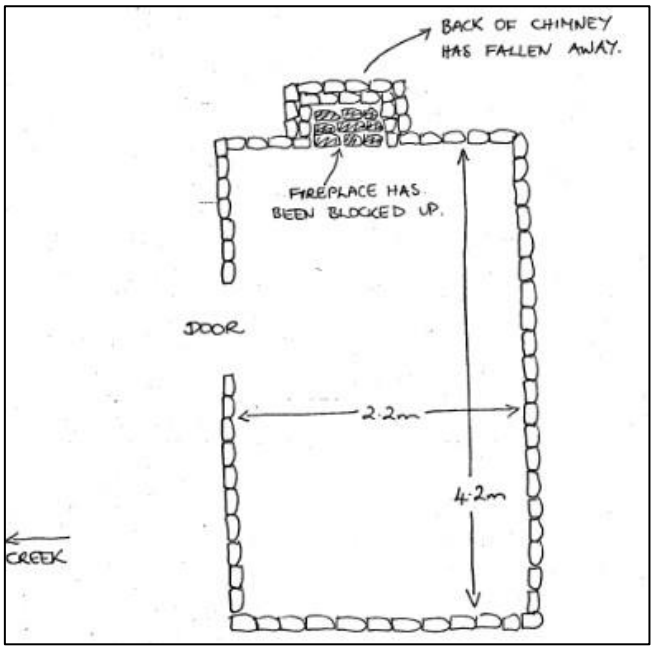


Figure 6-11. Sketch plan of G41/267 from 1980 site record form.

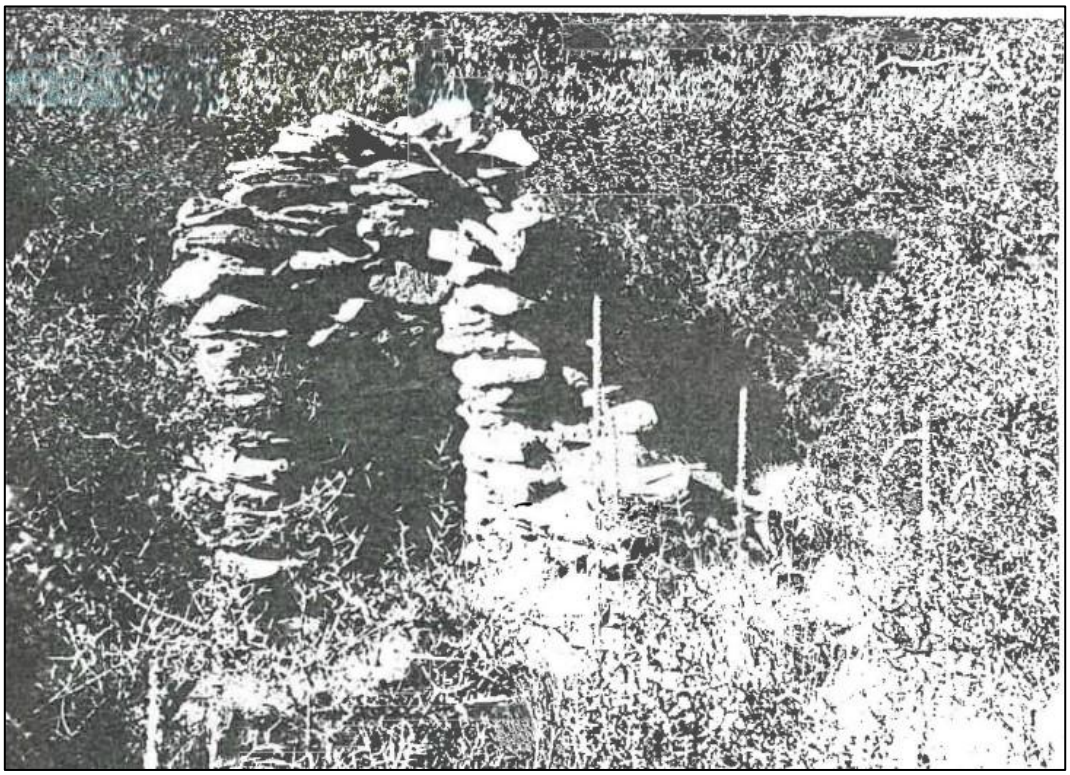


Figure 6-12. Photograph of hut G41/267 taken in 1990, showing the structure beginning to be enveloped in matagouri scrub (Hamel, 1993).

Figure 6-13. Site G41/265 looking east in 2005 (Nichol & Wright, 2006).

Figure 6-14. Rear wall of site G41/266 in 2005 (Nichol & Wright, 2006).

6.1.9 Site G41/269 (Rise and Shine Dam)

Jacomb and Easdale recorded a stone-faced dam within the larger area of workings (G41/264) in 1980 and drew a sketch map (Figure 6-15). This site was recorded as part of the wider gold workings complex by Hamel in 1990, when it was noted as being in a similar condition as recorded by Jacomb and Easdale (Hamel, 1993). The GPS coordinates were updated as part of Nichol and Wright's (2006) survey, and the dam photographed (Figure 6-16).

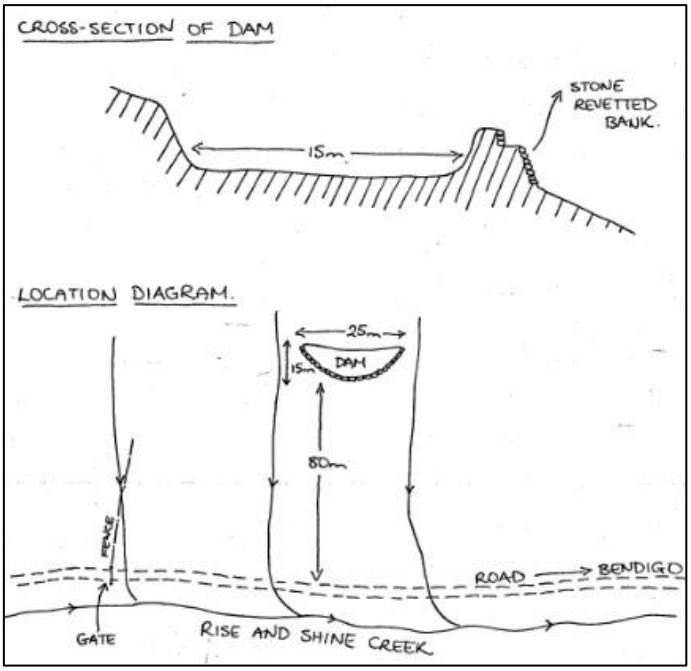


Figure 6-15. Sketch plan of G41/269 from 1980 site record form.

Figure 6-16. Site G41/269 in 2005, looking southeast (Nichol & Wright, 2006).

6.1.10 Sites G41/273 and G41/606 (Stone Huts)

Stone hut G41/273 was recorded in 1980 by Jacomb and Easdale. The site consists of a schist hut cut into the hillside and a path from the door towards the road. The walls of G41/273 were almost entirely collapsed, leaving

only the fireplace and an outline of low rubble visible. A sketch map was drawn for the site (Figure 6-17). The hut was revisited by Nichol and Wright in 2005 and found to be in the same condition as previously described, but almost entirely hidden by vegetation (Nichol & Wright, 2006) (Figure 6-18).

Site G41/606 was recorded in 2005 by Nichol and Wright. During their survey, the pair initially mistook this for the previously recorded G41/273 but later determined it was a new site. As a result, few details were recorded but Nichol and Wright note it was likely similar to the other hut and comprised a rectangular stone structure with low walls (Nichol & Wright, 2006). No photographs or sketch maps were attached to the SRF or any other reports.

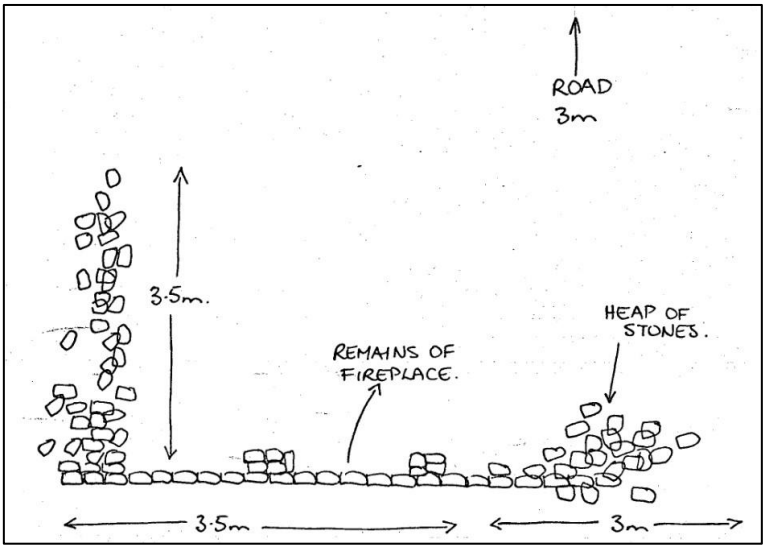


Figure 6-17. Sketch map of G41/273 from 1980 SRF.

Figure 6-18. Looking west at site G41/273 (stones just visible in centre of image) (Nichol & Wright, 2006).

6.1.11 Site G41/277 (Rise and Shine Mine and Battery)

Site G41/277 was recorded in 1980 by Jacomb and Easdale as the site of a stamper battery, of which only the concrete foundations remained. Two sets of concrete foundations were recorded, as well as tailings, remnants of a stone building partially buried by the tailings, and a revetted roadway. Hamel revisited the site in 1990 and drew three sketch maps of the site (Figure 6-19 and Figure 6-20). Wright and Nichol identified further features within the site in 2005, including four adits and a dam (Nichol & Wright, 2006). This site records the Rise and Shine mine complex (Figure 6-19 and Figure 6-20). It has been the location of mining operations since 1872. The site is shown in survey plan SO 2086, dating to 1876 (Figure 5-15), as the Eureka Mine but it was used by multiple syndicates in the nineteenth and twentieth centuries, including the Rise and Shine, Jubilee, Bendigo Rise and Shine, and Shine Again Syndicates (Carpenter, 2013b).

The roadway recorded may be the southeast extent of the Eureka tramway visible in SO 2086. The northwest extent of the tramway is recorded as part of the Eureka mine and battery (G41/252 – outside the current project area). Hamel (1993) identified the tramway or roadway near the mine and battery yet it is not shown in her plan of the site (Figure 6-19). However, her plan does show the water race (G41/586) that runs above the roadway further downstream. Hamel (1993) noted a number of drives between, and another revetted platform behind, the machine foundations. Further adits and sluice faces were added to the SRF by Nichol and Wright in 2005 (Nichol & Wright, 2006), and the site photographed (Figure 6-21 and Figure 6-22).

Some of the features associated with this site can be ascribed to the early twentieth century use of the site such as the concrete battery foundations, concrete mounting and associated revetted area in the 1910s or the battery remains, and possibly the dam and revetted terrace, associated with Bendigo Rise and Shine Company operations in the 1930s.

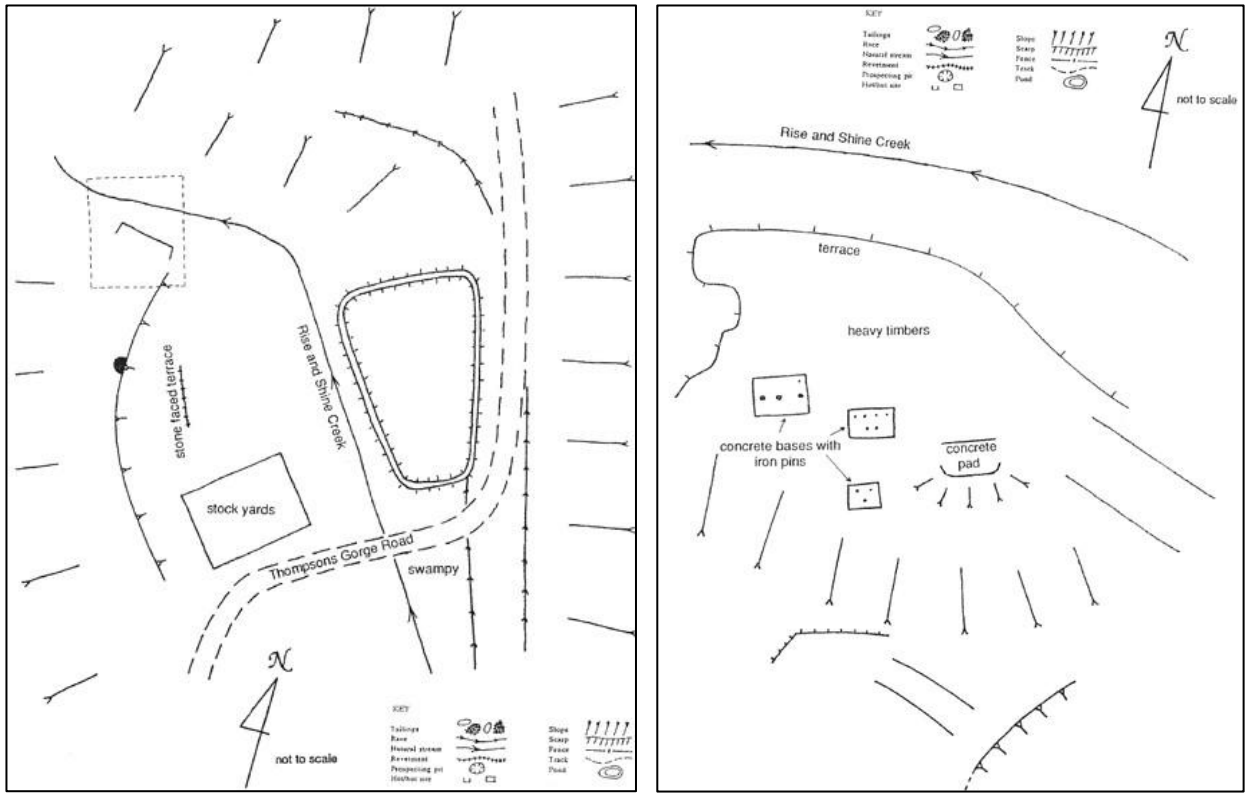


Figure 6-19. Sketch maps of G41/277 drawn in 1990 (Hamel, 1993).

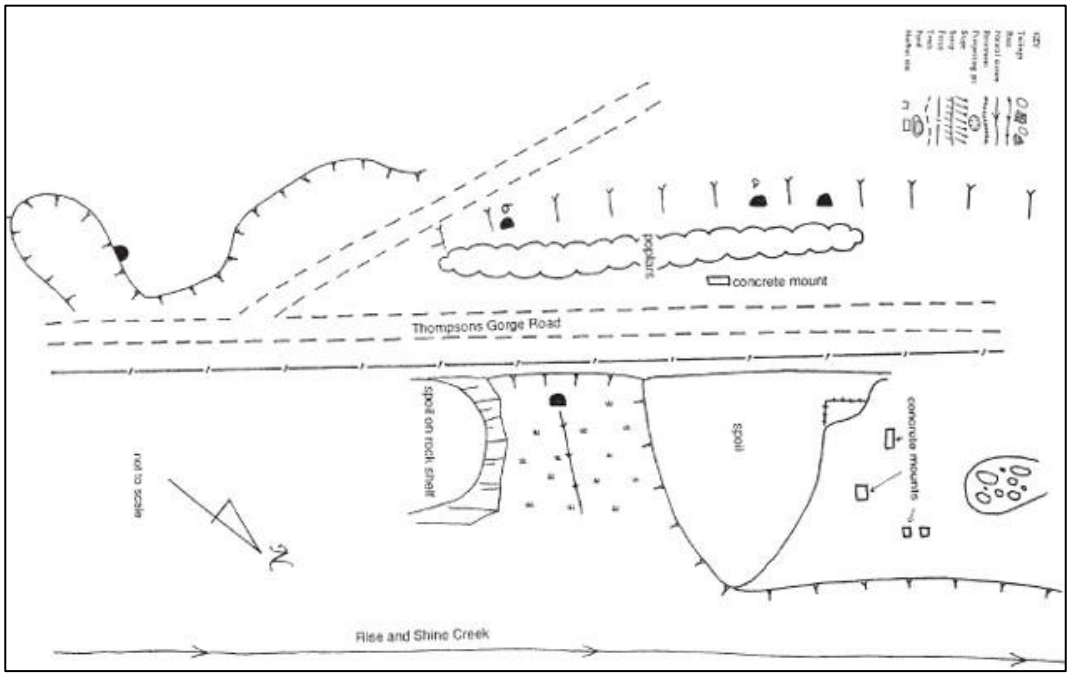


Figure 6-20. Sketch map of G41/277 drawn in 1990 (Hamel, 1993).

Figure 6-21. Concrete machine foundation at site G41/277 in 2005 (Nichol & Wright, 2006).

Figure 6-22. Looking east over G41/277 in 2005, with water race G41/586 visible at top left (Nichol & Wright, 2006).

6.1.12 Site G41/584 (Rise and Shine Water Race)

The Rise and Shine water race, completed in 1865 by the Rise and Shine Syndicate, was first recorded in 2005 by Nichol and Wright (2006). They recorded the lower north-western extent of the water race on the hillsides southwest of the Rise and Shine Creek (Figure 6-23 and Figure 6-24). Briden and Schmidt (2012) revisited the site in 2011 and recorded the upper southern portion of the water race around Mount Moka, and Carpenter photographed the upper portion of the race in 2012. The full extent of the Rise and Shine Water Race is over 10km in length.

Figure 6-23. Section of G41/584 in 2005, with notebook in ditch and backpack on bank (Nichol & Wright, 2006).

Figure 6-24. View of G41/584 on far side of valley in 2005 (Nichol & Wright, 2006).

Figure 6-25. Site G41/584, close to Thompsons Saddle (Carpenter, 2012).

6.1.13 Site G41/586 (Come-in-Time Water Race)

Site G41/586 was first recorded by Nichol & Wright in 2005 during their archaeological survey of the area. The race runs from a dam (G41/585) along the north bank of the Rise and Shine Creek before disappearing into a gully above Bendigo Creek. Sections of the race are revetted, and the race was cut by Thomson Gorge Road in several locations. Nichol & Wright (2006) suggested that it was one race constructed prior to the construction of the Come-in-Time Battery. However, the site actually comprises two pre-1900 races: one feeding the battery, the other taking the runoff water from the battery as shown in Carpenter's (2013b) plan. The northwest section of the Come-in-Time water race was not relocated by Nichol & Wright (2006) but Carpenter's (2013b) plan shows the extent of the race as it leads to the Come it Time battery (Figure 5-9). While both races were established prior to 1900, the Come-in-Time race was used into the twentieth century.

During their 2005 site survey, Nichol & Wright (2006), could not identify the northern extent of the race; however, they did indicate that the race heads south and west towards a gully above Bendigo Creek.

6.1.14 Site G41/589 (Revetted Road)

Site G41/589 is a revetted path (Figure 6-26) first recorded by Nichol and Wright in 2005. The path passes on the north side of Clearwater Creek, measured approximately 2m wide and was heavily overgrown in parts (Nichol & Wright, 2006).

Figure 6-26. Site G41/589 in 2005 (Nichol & Wright, 2006).

6.1.15 Site G41/604 (Battery and Turbine)

Site G41/604 is a mining complex first recorded by Hamel in 1990 but first recorded on ArchSite by Nichol and Wright in 2005. Hamel drew a sketch map of the site but struggled to find an interpretation for it. Hamel (1993), Nichol and Wright (2006) recorded a range of features, including a schist fireplace or forge, a terrace, sections of schist wall, ferrous pipes set into the ground, lengths of heavy timber, machinery components and the base of a potential turbine or pump (Figure 6-28). Nichol and Wright (note: in their report the site is described as G41/596) hypothesise that this may have been a battery site for the Red Mine North (G41/605).

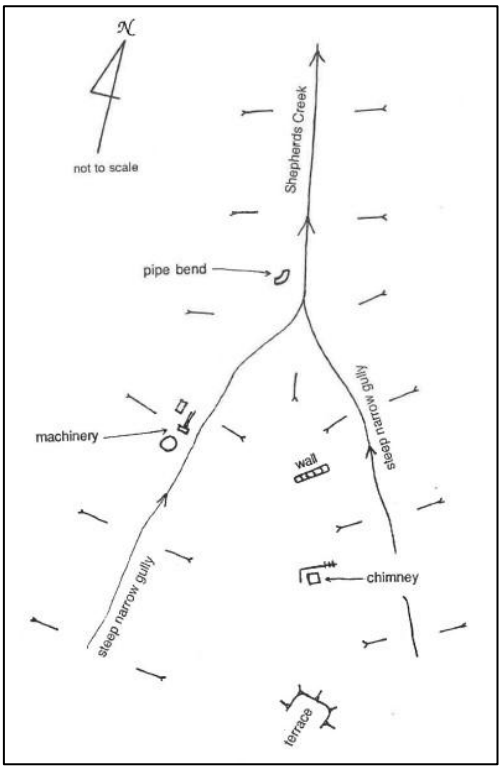


Figure 6-27. Sketch map of G41/604 from Hamel (1993).

Figure 6-28. Potential turbine remains at site G41/604 in 2005 (Nichol & Wright, 2006).

6.1.16 Site G41/605 (Mining Workings)

Site G41/605 is a mining complex first recorded by Hamel in 1990 but first recorded on ArchSite by Nichol and Wright in 2005. Hamel (1993) recorded it as one of four drives in the Red Mine area, likely used by the Cameron Brothers in the 1910s, but did not go into detail regarding the features within other than suggesting it was merely a prospecting drive based on its small size. Nichol and Wright (2006) recorded a range of features, including a large

trench, two shafts, an adit, an area of possible sluicing and various metal items on the surface or partially buried (note: in their report the site is described as G41/597; Figure 6-29).

Figure 6-29. Looking north over site G41/605 in 2005 (Nichol & Wright, 2006).

6.2 Bendigo Conservation Covenant

In August 2000 part of the project area was brought under a Conservation Covenant (full extent shown in Figure 4-1). This agreement between the landholders of Bendigo Station (John Charles Perriam and Heather Lorna Perriam) and the Minister of Conservation dictates that the affected land parcels must be managed with regards to a set of conservation objectives, of which the following relate to heritage:

- Maintaining the landscape values of the land as referred to in the "Application for exchange of property rights" submitted to the Commissioner of Crown Land
- Maintaining the historic values of the land as referred to in "The rich fields of Bendigo" by Jill Hamel February 1993.

Hamel's (1993) suggestions in her report are that "consideration should be given to retaining representative sites from each era – early alluvial mining, the main quartz mining period, turn of the century mining and 1930s quartz workings" with an emphasis on "intact, historically significant and informative sites, in good condition, still within an appropriate setting, and with an attractive landscape". The covenant further outlines the principal heritage values as comprising the Rise and Shine Creek area, the stone buildings near Ardgour Road, stone yards near Shepherds Creek, the Town of Bendigo, dam and dam keeper's hut on Aurora Creek, mining sites in Perrys Creek and stone yards near Devils Creek.

Condition 3 of the Covenant outlines activities that require the Minister of Conservation's approval, which include the "erection of any fence building structure or other improvements near historic sites", "any cultivation earthworks or other soil disturbance on the land near the historic sites" and "any tree planting on the land near historic sites", with "historic sites" defined as under the Historic Places Act 2013 (now the HNZPTA 2014).

Condition 9 of the Covenant is specific to the Rise and Shine Creek area (Sections 11 and 12 SO 24641), and states that the landowners must allow the public to access the historic mining sites, that the landholders and Department

of Conservation may remove woody vegetation from around historic sites, that the Minister may erect interpretation signs and that the land parcels will not be used for forestry or have tracks constructed on it. A variation to Condition 9 was signed in 2023, allowing for the construction of temporary tracks with the approval of the Minister and subject to a restoration and enhancement programme.

6.3 The Wider Archaeological and Heritage Context

There are 116 previously recorded archaeological sites within 1km of the project area, summarised in Table 6-2. The most common site type in the area is historic-domestic, accounting for 57 sites (including five unclassified sites that contain stone hut remains). All are ruinous schist huts that range in completeness from several walls to just the base of a chimney and are scattered along the floor and lower reaches of the Rise and Shine and Clearwater valleys, as well as across the Bendigo flat. Many of these huts are close to other mining features and as such have been interpreted as miners' huts; however, there is potential that some relate to pastoral occupation, or were used for both activities. Another 31 sites have been classified as relating to gold mining; however, this number is in reality higher when including the other mining associated sites that have been classified as other types. These include three sets of terracing that have been mis-classified as relating to timber milling, six industrial sites that include a mineshaft (G41/203), water races a dam and a forge, and a mine track or road that has been classed as transport/ communication. Mining sites cover a range of features and represent complexes of features (for example G41/201 and G41/256) and individual components of the mining landscape such as the Come-in-Time, Eureka and Alta batteries (G41/251, G41/252 and G41/253), water races (for example G41/673), tailings and/or mullock heaps (for example G41/696) and prospecting pits (for example G41/676).

Table 6-2. Previously recorded archaeological sites within 1km of the project area.

NZAA ID	Site Name	Site Type
G41/12		Transport/communication
G41/13		Unclassified
G41/14		Historic - domestic
G41/15		Historic - domestic
G41/16		Cave/ rock shelter
G41/165		Mining-gold
G41/166		Historic – domestic
G41/167		Historic – domestic
G41/168		Mining-gold
G41/169		Mining-gold
G41/170		Historic – domestic
G41/171		Historic – domestic
G41/176		Mining-gold
G41/177		Historic – domestic
G41/201		Mining - gold
G41/202		Cave/ rock shelter
G41/203		Industrial
G41/237		Historic – domestic
G41/238		Historic – domestic
G41/239		Historic – domestic
G41/242	Clearwater Creek	Mining - gold
G41/243		Agricultural/ pastoral
G41/244	Clearwater	Historic - domestic
G41/245	Clearwater Creek	Agricultural/ pastoral
G41/246	Rise and Shine Creek	Historic - domestic
G41/247		Historic - domestic
G41/248		Historic - domestic
G41/249		Historic - domestic
G41/250		Historic - domestic
G41/252	Eureka Mine and Battery	Mining - gold
G41/253	Alta Mine and Battery	Mining - gold
G41/254		Industrial
G41/255		Historic - domestic

NZAA ID	Site Name	Site Type
G41/257		Unclassified
G41/258		Unclassified
G41/259		Mining - gold
G41/260		Mining - gold
G41/268		Historic - domestic
G41/270	Rise and Shine Creek	Historic - domestic
G41/271	Rise and Shine Creek	Historic - domestic
G41/272	Rise and Shine Creek	Historic - domestic
G41/274	Rise and Shine Creek	Historic - domestic
G41/275		Historic - domestic
G41/276		Unclassified
G41/300	Bendigo Bakery	Commercial
G41/301		Historic - domestic
G41/302		Historic - domestic
G41/303		Mining - gold
G41/304	Bendigo Creek Tunnel Basin	Mining - gold
G41/305		Historic - domestic
G41/306		Agricultural/ pastoral
G41/307		Historic - domestic
G41/308		Historic - domestic
G41/309		Historic - domestic
G41/311		Historic - domestic
G41/312		Historic - domestic
G41/314		Industrial
G41/315		Mining - gold
G41/316		Historic - domestic
G41/317		Historic - domestic
G41/318		Mining - gold
G41/319		Historic - domestic
G41/320		Historic - domestic
G41/321		Historic - domestic
G41/322		Historic - domestic
G41/323		Historic - domestic
G41/324		Commercial
G41/325		Commercial
G41/326		Cave/ rock shelter
G41/327		Unclassified
G41/331		Industrial
G41/332		Mining - gold
G41/349		Historic - domestic
G41/350		Historic - domestic
G41/352		Historic - domestic
G41/353		Historic - domestic
G41/354		Historic - domestic
G41/355		Mining - gold
G41/356		Mining - gold
G41/357		Mining - gold
G41/358		Historic - domestic
G41/359		Historic - domestic
G41/360		Mining - gold
G41/53		Artefact find
G41/585		Mining - gold
G41/586		Industrial
G41/587		Timber milling
G41/588		Artefact find
G41/590		Transport/ communication
G41/591		Historic - domestic
G41/592		Historic - domestic
G41/593		Timber milling
G41/594		Timber milling

NZAA ID	Site Name	Site Type
G41/638	Thomsons Saddle	Agricultural/ pastoral
G41/669		Mining - gold
G41/670		Mining - gold
G41/671		Mining - gold
G41/672		Mining - gold
G41/673		Mining - gold
G41/678		Historic - domestic
G41/679		Mining - gold
G41/680		Mining - gold
G41/681		Historic - domestic
G41/682	Revetted Pier	Mining - gold
G41/683		Mining - gold
G41/684		Mining - gold
G41/685		Mining - gold
G41/686		Mining - gold
G41/687		Historic - domestic
G41/688		Historic - domestic
G41/689		Mining - gold
G41/690		Mining - gold
G41/691		Historic - domestic
G41/696	Prospect Shaft No2 & trenches	Mining - gold

Four agricultural/pastoral sites have also been recorded in the area, including stone stock yards (G41/245), a fence line (G41/638) and two unidentified stone structures (G41/243 and G41/238). Other site types include commercial buildings in the Bendigo settlement (G41/300, G41/324 and G41/325), three cave or rock shelters (G41/16, G41/202 and G41/326) above Bendigo creek that were unable to be accessed at the time of recording but at least one had a stacked schist wall enclosing the front so is likely nineteenth century in date, a findspot for a hoe (waka paddle) in a cave above Bendigo Creek (G41/53) and a pit feature that has been tentatively identified as a potential umu tī (G41/632). These last two sites act as a tangible reminder that this landscape has been occupied for centuries.

There are also two scheduled heritage items on the CODC District Plan close to the project area. The first lies within the Bendigo Quartz Reefs Historic Area: Goldfields Remains, Bendigo Historic Reserve, SO 20026 & Section 32 Block III, Wakefield SD (Item 184 in Schedule 19.4), but does not include the portion of the Historic Area that extends into the project area. The other is Shepherds Hut (archaeological site G41/631), built in the early 1900s, on Thomson Gorge Road, Matakanui, Run 238N Section 1 Block IX Lauder SD (Item 185 in Schedule 19.4).

6.4 Mining Sites in the Heritage Record

Across the South Island, there are more than 2000 mining – gold sites and a further 167 mining sites associated with other forms of mining recorded in the ArchSite database. Sites are concentrated in Central Otago, along the West Coast and in smaller pockets in Marlborough, Tasman, and Southland Districts. The nature of gold mining sites is varied as features relate to different working aspects of the gold fields and trace chronological differences in mining technology and equipment. For example, many features relate to the storage and movement of water required for sluicing and hydraulic elevating (e.g., water races, reservoirs, ponds, aqueducts, dams), others relate to the physical remains of mining activities (e.g., sluice faces, tailings, prospecting pits) or the specific equipment and machinery that was utilised (dredge, stamper battery, machinery). In addition, there are also features and materials associated with the domestic lives of miners living in close proximity to gold workings (e.g., stone and sod huts, hut floors, artefacts).

The gold mining landscapes of central Otago have undergone a significant number of archaeological surveys, with high frequencies of archaeological sites recorded. However, the expansive and complex nature of goldfields paired with rugged isolated terrains and challenges with site access, mean that many landscape features remain unrecorded.

Surveys have often addressed technological aspects of visible features and machinery, with only select excavations taking place.

Examples of site complexes that display a comparable sequence to those in the BOGP area include the Alta workings (sites G41/252, G41/253, G41/254, G41/255, G41/590 and G41/671), a large area of sluicing and pot hole workings just south of Matilda Rise (sites G41/310, G41/318 and multiple associated huts and other features within these site extents), and the impressive sluicing and tailings at Quartz Reef Point (sites G41/554 and G41/745). While only one of these falls within the boundary of the Covenant (the Alta workings), part of the Quartz Point workings is designated as historic reserve, and all are far easier to access or view than the Rise and Shine workings proposed for removal, being adjacent or close to public roads that can be accessed without a 4WD.

More widely across Otago there are a number of extensive archaeological investigations that have occurred, though the hut and camp sites of miners have been the primary features investigated. For example, in 1993 Bristow excavated a miner's hut in the Old Man Range (F42/154). This site revealed important aspects of hut construction and uncovered several artefacts, including three tin matchboxes, a Chinese button and a broken alcohol bottle (Bristow, 1995). Three miners' huts were also excavated by Petchey at Macraes Flat in 1999 (Petchey, 1999). Similarly, aspects of hut construction were investigated, and several deposits containing faunal remains and artefacts were uncovered. Midden contents included pig and sheep bone fragments, as well as several Worcester sauce bottles, coffee and chicory bottles, ring-seal beer bottles, spirit bottles and Chinese ceramic fragments. Many other hut and mining camp sites have been investigated elsewhere in Otago; however, these sites have been classified by a different site type (e.g., historic – domestic). One seminal project that has informed archaeological investigations in Otago and beyond, is the Clutha Archaeological Project. Prior to the construction of the Clyde Dam, and the formation of Lake Dunstan, a series of archaeological investigations including several surveys and excavations were undertaken throughout the area. Mining sites (i.e., tailings; dams, water races, shafts, prospecting pits) were largely recorded by survey only; however, numerous huts and occupation sites associated with Chinese minors were excavated. Part of the project also involved attempts at salvaging remains of gold dredge remains from the Kawarau River (Ritchie, 1987).

Smaller, isolated excavations have also occurred on several other mining sites across the wider region: such as recording of tailings and associated artefacts (H45/112) near Glenore (Moyle, 2023), trenching across the Enterprise Race (H41/90) at Naseby (Hamel, 1999), investigations of the Eldorado water races (H44/1019 and H44/1020) and nearby tailings at Deep Stream (Watson, 2000), as well as the nearby Deep Creek Water Race (H44/1061) (Jacombs, 2010). Due to the limited scale of excavations, there was limited information garnered from these investigations; however, several provide comparative information for the construction and formation of such features as water races.

6.5 Historic-Domestic Sites in the Heritage Record

The Otago region has more than 1100 historic – domestic sites recorded in ArchSite. These sites often contain structural features associated with buildings (e.g., farmsteads, cottages, huts), although other domestic features such as rubbish pits, artefact deposits, garden features, boundary walls and fencing have also been classified as historic/domestic site types. Of the 1100 sites, approximately 400 sites are recorded as huts, many of which relate to periods of goldmining and the homes of miners. While many archaeological excavations have investigated historic sites in the Otago region, the University of Otago excavations at the Lawrence Chinese Camp (H44/1018) recorded as a historic-land parcel site along the Clutha/Mata-au have uncovered some of the largest quantities of material associated with miners' residences and domestic lives. For example, a recent study reports on the production and trade of Chinese opium pipe bowls from Southern China to Lawrence (Wu et al., 2020). Structural remains of buildings, paths and drains was identified at Lawrence and 300 bags of artefacts were removed from the site (Jacomb et al., 2005). While quite different to the potential occupational sites that may be encountered within the project area, it is likely that similar features and deposits may be encountered on a smaller scale. Such

as remains for domestic structures, landscaping features (paths), horizontal infrastructure (drains) and artefacts relating to the occupation of these buildings.

7 NZHP Site Surveys

Multiple site surveys of the project area were carried out between November 2017 and March 2025 by Naomi Woods, Megan Lawrence, Jasmine Weston, Julia Lewis, Phoebe Scrivener, Victoria Ross, Alix Muir and Claire Thorrold of NZHP and Matt Sole of Kopuwai Archaeology (Lawrence et al., 2019; Megan Lawrence, 2019, 2020, 2021b, 2021a, 2022c, 2022a, 2022b, 2022d, 2023; Lawrence & Hurford, 2022; Sole, 2022; Woods, 2017, 2018) to record the extent and condition of visible archaeology and to identify areas of modification within the project area that may affect the condition of subsurface archaeology. NZHP has been actively involved in archaeological site avoidance within the project area since 2017, including two visits to selected sites in March and December 2025 as part of consultation with HNPZT, and as a result the condition of the sites has remained stable since each was surveyed. The total area surveyed by NZHP extends outside the current project area, but only those sites within the proposed extent of the BOGP are discussed here.

7.1 November 2017 Survey

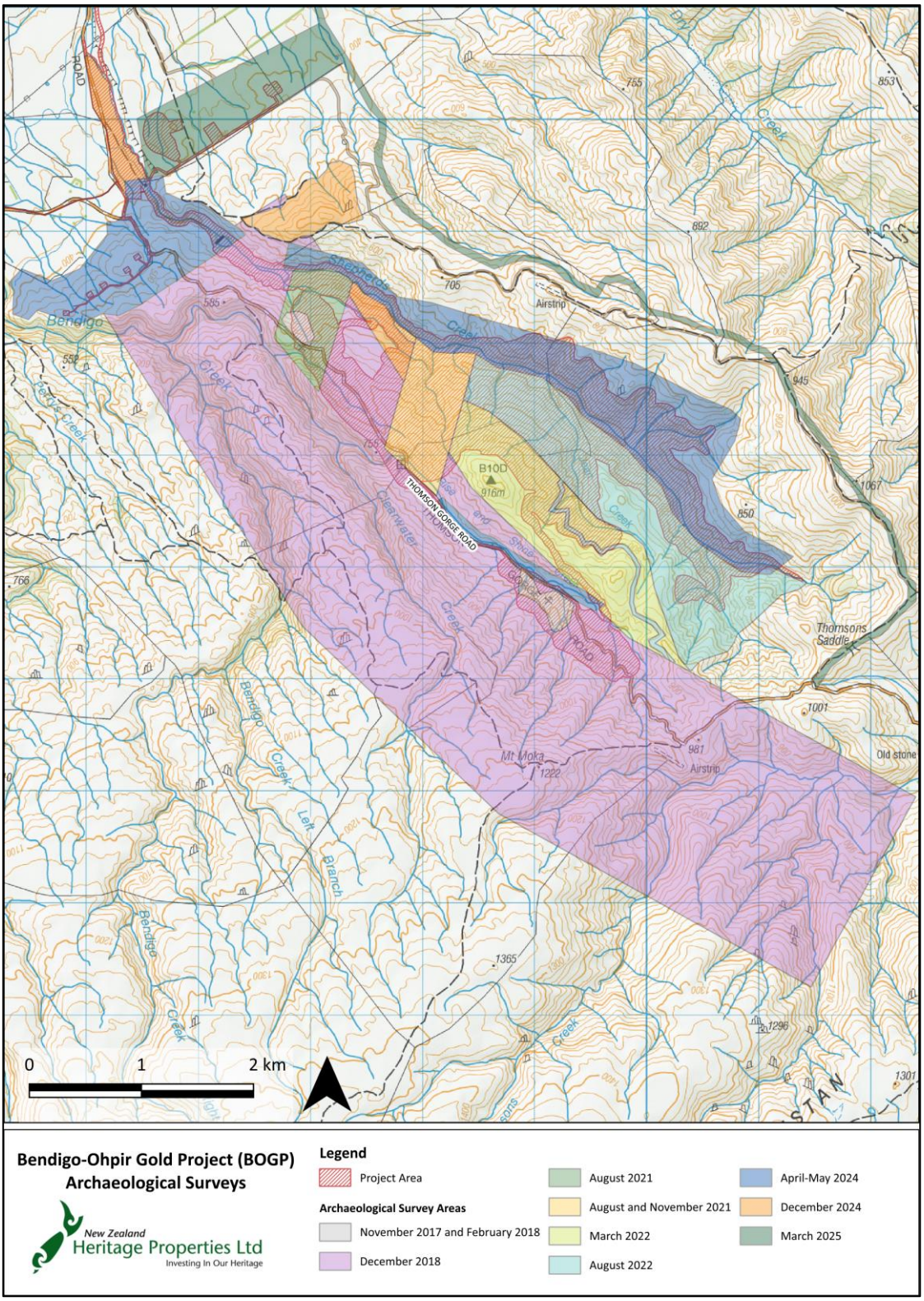
NZHP was commissioned to assess the impact of trenching and access routes for MGL in the Thompsons Gorge area, Central Otago in November 2017. A pedestrian survey of the proposed access routes and trench locations by Dr Naomi Woods on 1 November 2017 confirmed that all trenches and access routes avoided archaeological features (Woods, 2017). The survey results for each trench location are summarized in Table 7-1 and Table 7-2 along with brief descriptions of the access routes.

Table 7-1. Table showing previously recorded sites relocated during the November 2017 survey.

Status	Archaeological site	Known Associated Activity
Previously recorded sites revisited	Gold mining workings (G41/264)	Nineteenth century
	Stone hut (G41/265)	Nineteenth century
	Stone hut (G41/266)	Nineteenth century
	Stone hut (G41/267)	Nineteenth century
	Dam (G41/269)	
	Turbine and battery (G41/604)	Nineteenth and twentieth century
	Mine (G41/605)	Nineteenth and twentieth century

Table 7-2. Summary of November 2017 survey results.

Trench	Area	Access Route
TR31800N	CIT	Access route passes to north of site G41/605, follows ridge line to trench.
TR31750N	CIT	Access route passes to north of site G41/605, follows ridge line to trench.
TR31650N	CIT	Short access route downslope from road, does not pass or intersect any archaeological features.
TR30050N	RAS	Two possible access routes: downslope from drill track or uphill from road. Neither route passes or intersects archaeological features.
TR30150N	RAS	Access is upslope from drill track, does not pass or intersect with archaeological features.
TR30250N	RAS	Access is off drill track, along shallow valley and then upslope, does not pass or intersect with archaeological features.
TR28500N	ALV S	Access is along drill track then over creek. Tailings and large hoop iron close to trench access (GPS 264d), excavator will pass to the southeast of these features.
TR28520N	ALV S	Entire access route along drill track. Track passes sites G41/265, G41/266 and G41/267 but all are avoided and easily visible.
TR28700N	ALV N	Entire access route along drill track, passes to north of site G41/269 but with several metres clearance. Also passes late twentieth century drilling platforms on N side of access.



Bendigo-Ohpir Gold Project (BOGP)
Archaeological Surveys

New Zealand Heritage Properties Ltd
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Legend

- Project Area

Archaeological Survey Areas

- November 2017 and February 2018
- December 2018
- August 2021
- August and November 2021
- March 2022
- August 2022
- April-May 2024
- December 2024
- March 2025

Figure 7-1. Map showing the location of previous archaeological surveys undertaken between 2018 and 2025.

7.2 February 2018 Survey

NZHP was commissioned to assess the impact of drilling and access routes for MGL in the Thompsons Gorge area, Central Otago in February 2018. A pedestrian survey by Dr Naomi Woods on 13 February 2018 confirmed that 41 drill sites and associated access routes did not impact archaeological sites, nine drill sites required specific site avoidance and/or protection measures, and that two sites were unable to be accessed without impacting archaeological sites and were therefore discarded (Woods, 2018). Table 7-3 and Table 7-4 summarises the results of this survey.

Table 7-3. Table showing previously recorded and new sites visited during the February 2018 survey.

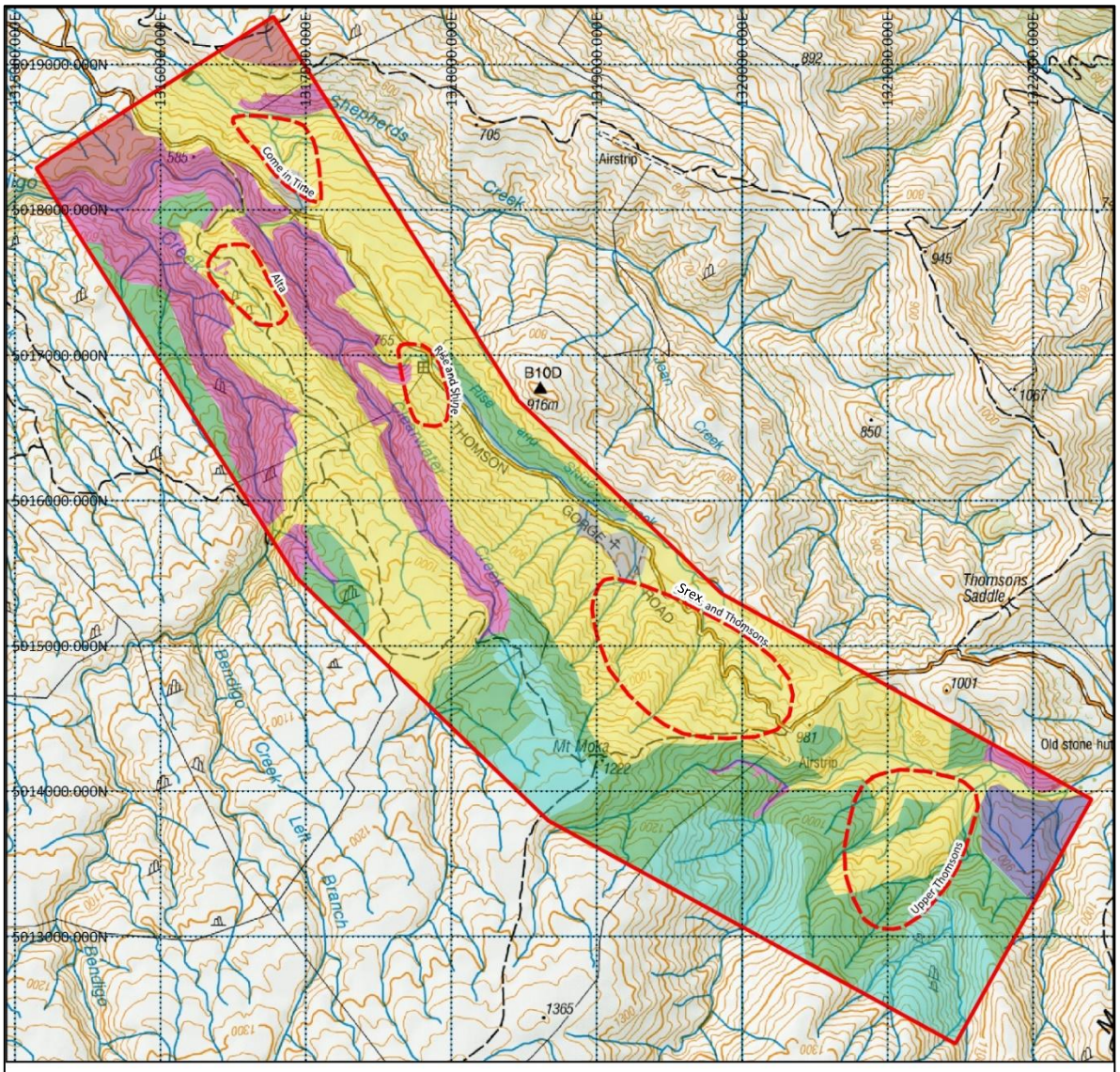
Status	Archaeological site	Known Associated Activity
Previously recorded sites revisited	Gold mining workings (G41/264)	Nineteenth century
	Rise and Shine mine and battery (G41/277)	Nineteenth and twentieth century
	Rise and Shine Water Race (G41/584)	Nineteenth century
New Sites	Hut terrace (G41/658)	Nineteenth century

Table 7-4. Summary of results of February 2018 pedestrian survey.

Area	No. of drill sites	Brief summary of survey results
CIT	9	Access route for one drill site (N31840-1) crosses a water race and is close to multiple archaeological sites that require avoidance.
RAS	9	Access to one drill site (N30400-1) passes through site G41/277 and another (N30320-1) is close to a revetted wall, possibly also part of site G41/277.
ALV	28	Four of the access routes (28kd, 32kc1, 28ka and the track leading to N28200-1) cross water races and access to one drill site (N28760-1) is through an area of intensive archaeological activity, including newly recorded site G41/658. Drill site N28360-1 is close to an area of gold working and may need to be accessed by an alternative route to avoid this.
TSD	6	No drill sites or access routes impact archaeological sites.

7.3 December 2018 Survey

A pedestrian survey of part of the current project area was conducted by Dr Naomi Woods, Phoebe Scrivener, Megan Lawrence, Julia Lewis, and Jasmine Weston over nine days between 10 and 20 December 2018 for MGL. The survey had a primary focus of locating and assessing heritage sites and features within the area shown in Figure 7-2. The project area was defined by a dataset of LiDAR tiles provided by MGL, with particular focus on five exploration target areas (Come-in-Time, Alta, Rise and Shine, Srex, and Thompsons and Upper Thompsons). In total, 23 previously recorded archaeological sites were relocated during the project survey (Table 7-5). Of these, the SRF for 14 sites were updated with associated features, condition details, and/or site extents. Of the remaining sites, a total of 26 sites were not visited during the pedestrian survey. A large proportion of the remaining sites could not be accessed due to overgrown vegetation and health and safety concerns. This was especially so for sites at the northern end of the Clearwater Creek valley, where 13 sites are located. Elsewhere sites were, again, likely not identified in the field due to overgrown vegetation obscuring sites, as has been experienced during previous pedestrian surveys of the areas. In select instances the sites may not be visible on the surface anymore. However, 23 sites were relocated using LiDAR and aerial images along with information from previous SRFs. During the course of the survey a total of 10 new archaeological sites were recorded.



Legend

- 2018 LiDAR Area
- Target Exploration areas
- Pedestrian survey
- Low vegetation (viewed from distance)
- Previously surveyed (2017 and 2018)
- Not surveyed (vegetation and slopes)
- Not surveyed (mire)
- Not surveyed (inaccessibility)
- Excluded during survey by client
- Excluded during survey

Bendigo - Ophir Project
Archaeological Baseline Survey

Scale 1:40000

0 0.25 0.5 0.75 1 km

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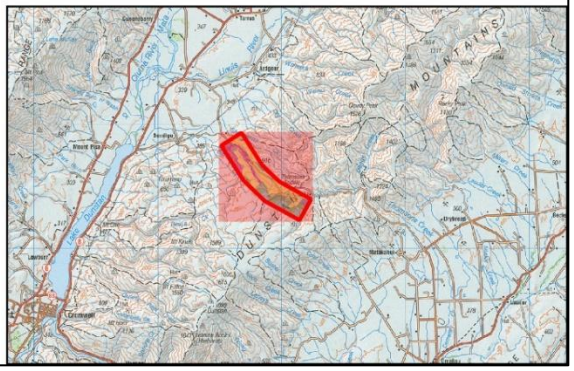

Figure 7-2. Plan showing area covered by the 2018 pedestrian survey.

Table 7-5. Table showing previously recorded sites relocated, previously recorded sites not relocated and new sites recorded throughout the survey area during the December 2018 survey.

Status	Archaeological site	Known Associated Activity
CIT		
Previously recorded sites revisited	Come-in-Time battery (G41/251)	Nineteenth and twentieth century
	Come-in-Time water race (G41/586)	Nineteenth and twentieth century
	Revetted road (G41/589)	Nineteenth and twentieth century
	Turbine and battery (G41/604)	Nineteenth and twentieth century
	Mine (G41/605)	Nineteenth and twentieth century
Previously recorded sites relocated on LiDAR data only	Alluvial gold workings (G41/242)	Nineteenth century
	Stone hut (G41/244)	Nineteenth century
	Stone enclosure (G41/245)	Nineteenth century
	Stone hut (G41/246)	Nineteenth century
	Stone hut (G41/591)	Nineteenth century
	Stone hut (G41/592)	Nineteenth century
	Terrace or pathway (G41/593)	Nineteenth century
	Revetted terrace (G41/594)	Nineteenth century
Previously recorded sites not relocated	Stone structure (G41/243)	Nineteenth century
	Stone hut (G41/247)	Nineteenth century
	Stone hut (G41/248)	Nineteenth century
	Stone hut (G41/249)	Nineteenth century
	Stone hut (G41/250)	Nineteenth century
New sites	Hut or tent site (G41/678)	Nineteenth century
Alta		
Previously recorded sites revisited	Eureka mine and battery (G41/252)	Nineteenth and twentieth century
	Alta Battery (G41/253)	Nineteenth and twentieth century
	Chimney and mine shaft (G41/255)	Unknown
Previously recorded sites relocated on LiDAR data only	Mine road or track (G41/590)	Unknown
Previously recorded sites not relocated	Forge (G41/254)	Unknown
New sites	Dam (G41/671)	Unknown
	Mullock pile (G41/672)	Unknown
	Water race (G41/673)	Unknown
RAS		
Previously recorded sites revisited	Stone hut (G41/271)	Nineteenth century
	Stone hut (G41/272)	Nineteenth century
	Rise and Shine mine and battery (G41/277)	Nineteenth and twentieth century
Previously recorded sites not relocated	Stone hut (G41/270)	Nineteenth century
	Stone hut (G41/273)	Nineteenth century
	Dam (G41/585)	Nineteenth century
	Terraces (G41/587)	Unknown
	European artefacts (G41/588)	Unknown
	Revetted pathway (G41/603)	Unknown
	Stone hut (G41/606)	Nineteenth century
Previously recorded sites not relocated	Stone hut (G41/275)	Nineteenth century
	Stone hut (G41/276)	Nineteenth century
New sites	Tailings (G41/670)	Unknown
SHR and TSD		
Previously recorded sites revisited	Gold mining workings (G41/264)	Nineteenth century
	Dam (G41/269)	Nineteenth century
	Water Race – rise and shine (G41/584)	Nineteenth century
	Fence line and holding yard (G41/638)	Nineteenth and twentieth century
	Stone hut (G41/267)	Nineteenth century
	Stone hut (G41/268)	Nineteenth century
	Stone hut (G41/265)	Nineteenth century
	Stone hut (G41/266)	Nineteenth century
	House or hut terrace (G41/658)	Nineteenth century
Previously recorded sites not relocated	Collapsed schist hut (G41/274)	Nineteenth century
New sites	Water race (G41/677)	Unknown
	Gold mining workings (G41/669)	Nineteenth century
UTS		
Previously recorded sites revisited	Pit (G41/632)	Unknown
	Stone hut (G41/634)	Unknown
	Stone hut and water race (G41/635)	Unknown
	Gold mining tailing field (G41/636)	Unknown
New sites	Stone hut (G41/674)	Unknown
	Prospecting pit (G41/675)	Unknown
	Prospecting pit (G41/676)	Unknown

7.4 August and November 2021 Surveys

NZHP was commissioned by MGL to appraise the heritage and archaeological impacts of proposed further drilling throughout the Bendigo-Ophir Area, Central Otago under the HNZPTA 2014 and in response to Condition 3 of Letter of Authority issued by the DoC for the Bendigo Station Conservation Covenant Area in late 2021 (Lawrence, 2021a). As part of this work Megan Lawrence undertook a desktop appraisal using historical research and LiDAR data to identify potential heritage sites followed by a pedestrian survey of the new area. Parts of the project area were physically inaccessible due to gradient or dense matagouri scrub, but this was offset somewhat by the analysis of LiDAR data.

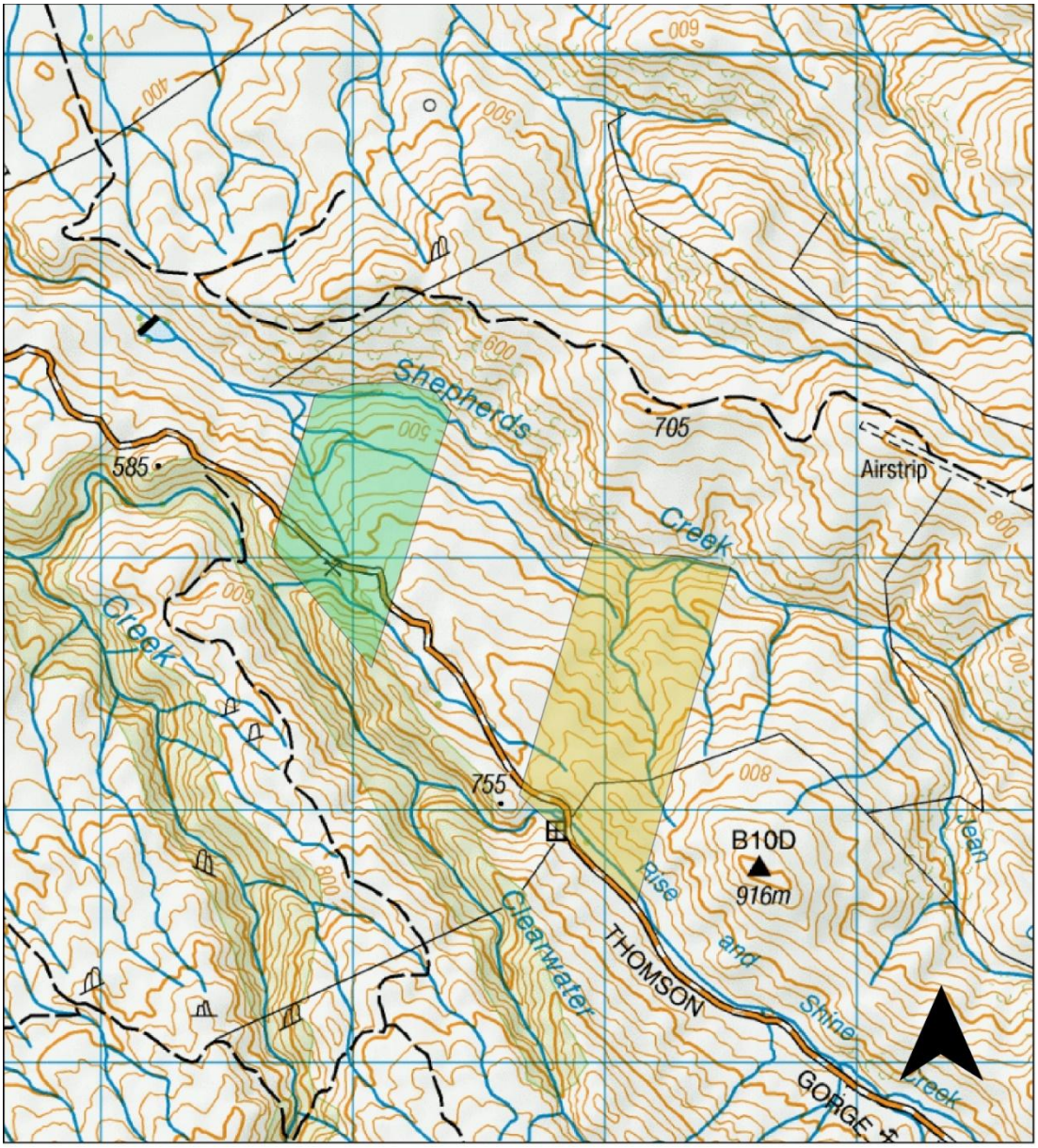

Figure 7-3. Plan showing the location of the August and November 2021 Surveys.

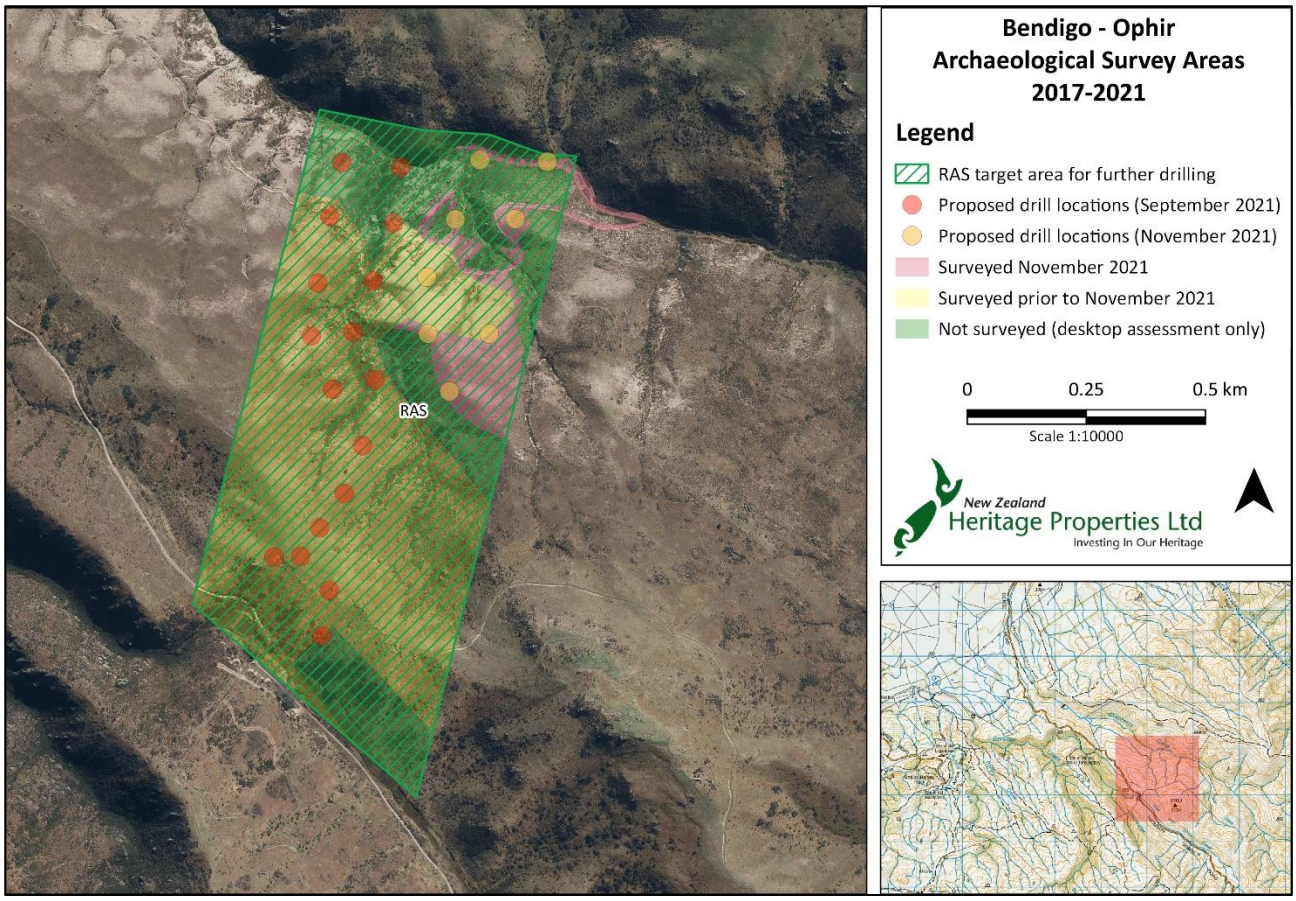

Figure 7-4. Map showing areas survey within the RAS area (shaded green). Further drilling is proposed throughout the RAS target area (green) with the initial 17 shown in red and the next 8 drill sites shown in orange. Locations may vary depending on results of testing.

Table 7-6. Table showing previously recorded and new sites visited during the August and November 2021 surveys.

Status	Archaeological site	Known Associated Activity
Previously recorded sites revisited	Rise and Shine mine and battery (G41/277)	Nineteenth and twentieth century
New Sites	Matakanui-Bendigo Road (G41/782)	Nineteenth and twentieth century

Table 7-7. Brief summary table of drill sites and the Matakanui-Bendigo Road.

Area	No. of drill sites	Brief summary of survey results
RAS: Initial proposed drill sites	17	No drill sites or access tracks to these locations as work will impact recorded archaeological or heritage sites.
RAS: Further proposed drill sites	8	No drill sites or access tracks to these locations as work will impact recorded archaeological or heritage sites.
RAS: Future sites	TBD	The wider RAS proposed drilling area extends into the extent of the Rise and Shine mine and battery (G41/277). MGL has been provided GPS points of identified features associated with this site that should be avoided.
Matakanui to Bendigo Road	N/A	No drill sites impact recorded archaeological sites. Heritage features along the historic Matakanui to Bendigo Road include nine historic culverts, two stone revetments and one drill scar location present. A narrow track formation may have continued from this road running southeast of the RAS area. The client has GPS data showing the extent of these heritage features that will be avoided.

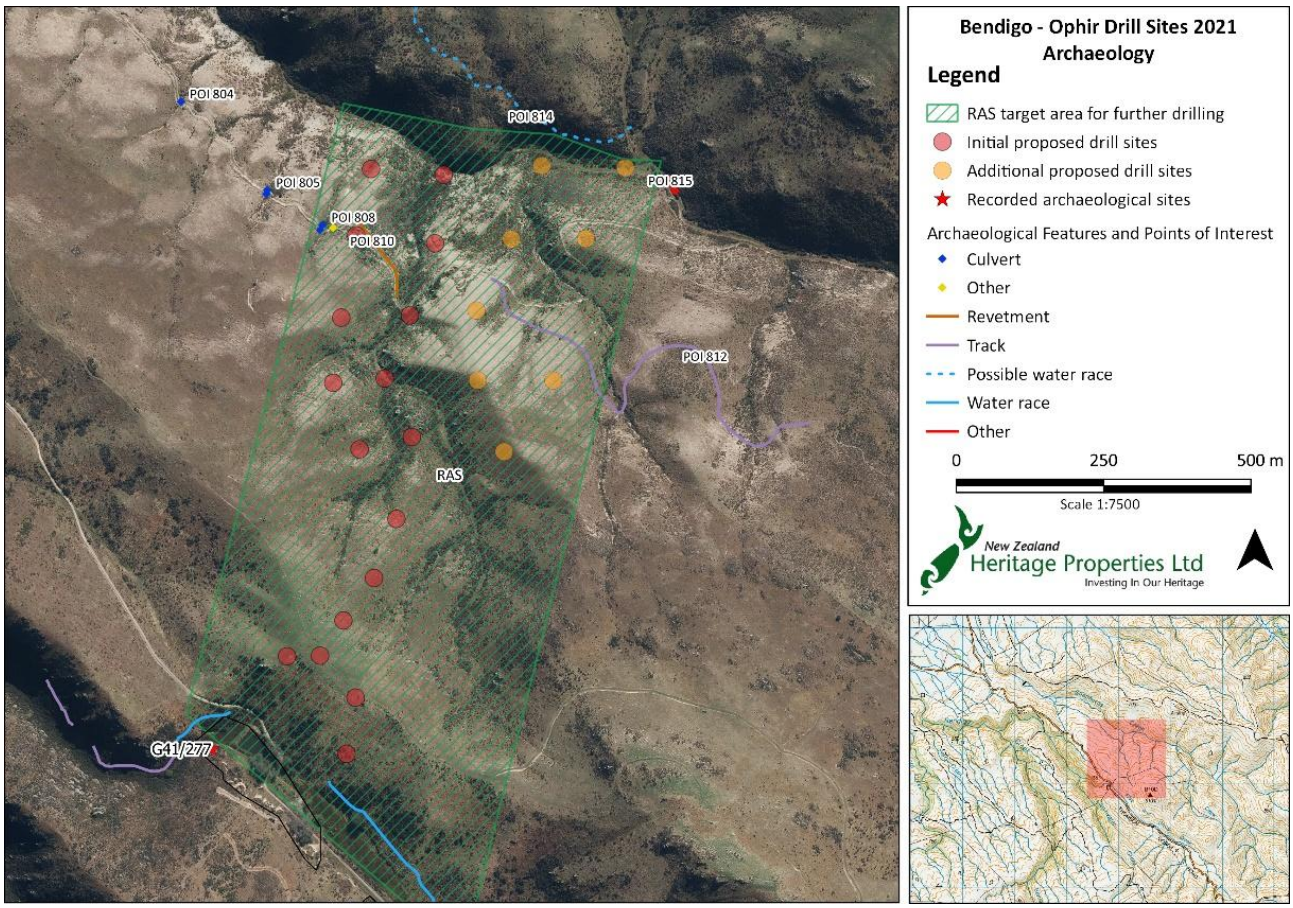

Figure 7-5. Proposed drills sites and survey area for August and November 2021 surveys.

7.5 March and August 2022 Surveys

NZHP was commissioned by MGL to undertake an appraisal to identify any heritage and archaeological features throughout the Srex (SHR), Srex East (SRE) and Thomsons Saddle (TSD) target areas within Bendigo Station as shown in Figure 7-6. Resources consulted for this desktop appraisal included LiDAR, ArchSite, historical aerials, historic survey maps, and geological plans. An archaeological survey was undertaken by Matt Sole on 3 March and 19 August 2022. The survey followed through the priority area of the next phase of exploratory drilling through the centre of the block, between the Rise and Shine Creek Valley and over into Jean Creek. The survey focused on the POI identified in the desktop survey, and further POIs identified by Matt Sole. The Jean Creek area was surveyed from the ridge down, along Jean Creek and then returning up the hill via POIs. En route, the wider area was examined for any signs of heritage or archaeological features. The sunny faces above Shepherds Creek below the survey area appeared barren (Lawrence, 2022c). All POI were determined to be natural land formations with the exception of those summarised in Table 7-8.

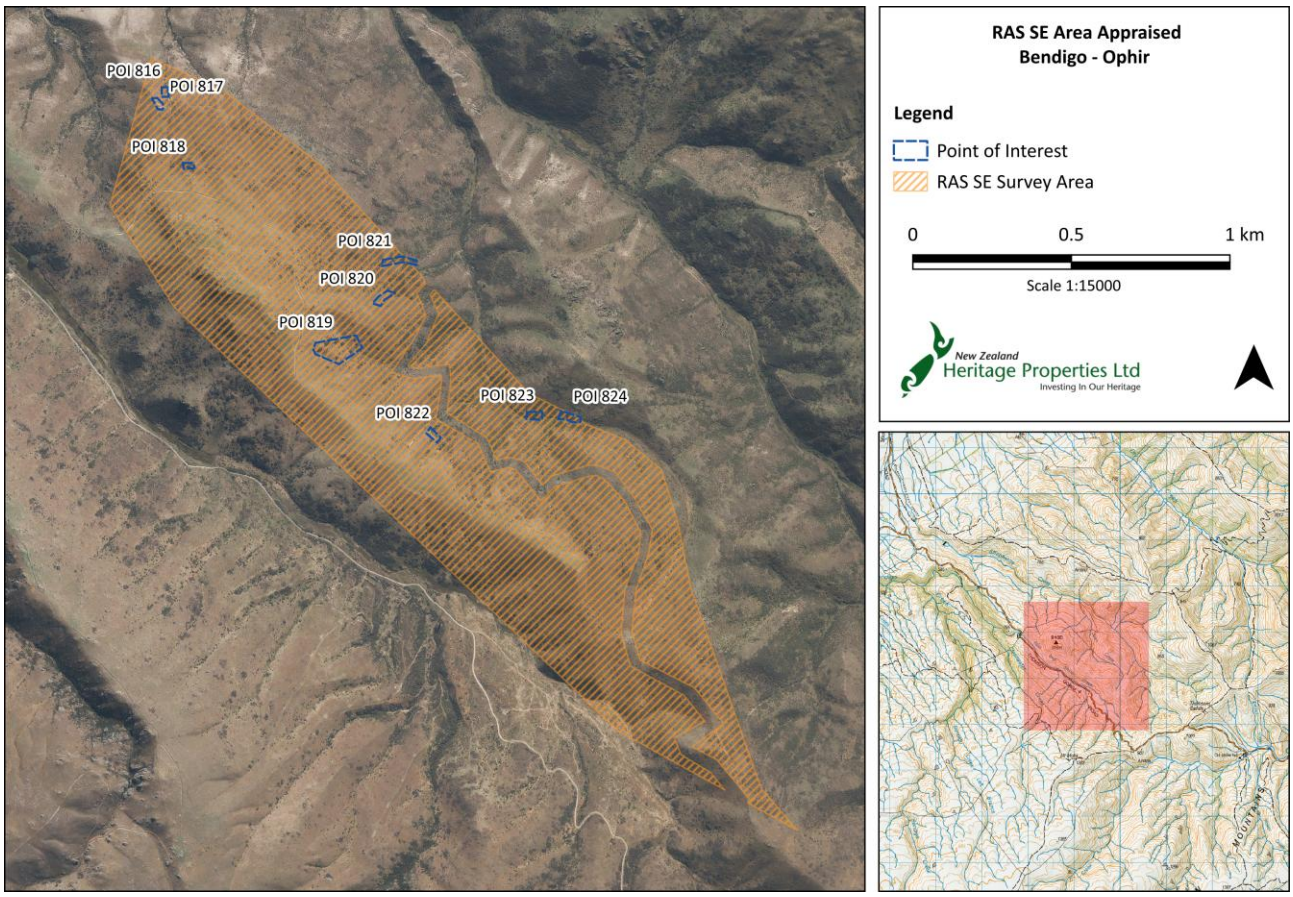

Figure 7-6. Map showing recorded archaeological sites and POI identified during desktop research in relation to the area appraised and surveyed in March 2022.

Table 7-8. Table showing sites visited during the August and November 2021 surveys.

Status	Archaeological site	Known Associated Activity
New Sites	POI 815 - Hut Site (G41/785)	-
	POI 843 - Sluicing (G41/789)	-
	POI 844 - Tailings (G41/787)	-
	POI 845 - Hut Site (G41/786)	-

7.6 February 2023 Survey

NZHP was commissioned by MGL to undertake an appraisal to identify any heritage and archaeological features throughout the RAS target area within the Bendigo Station in response to the Letter of Authority issued by DoC for the Bendigo Station Conservation Covenant Area. This letter followed on from the 2021 appraisal (Lawrence, 2021) as well as surveys undertaken by NZHP between 2018 and 2021. Another survey was undertaken by Victoria Ross on 28 February 2023 to investigate previously unsurveyed areas within the RAS target area. The areas surveyed between 2018 and 2023 in the target area are shown in Figure 7-7. Resources consulted for the desktop research included LiDAR, the NZAA Site Recording Scheme, Archives New Zealand, historical aerials, historic survey maps, and geological plans. Two previously recorded sites (G41/277 and G41/584) were revisited during this survey but no new sites found.

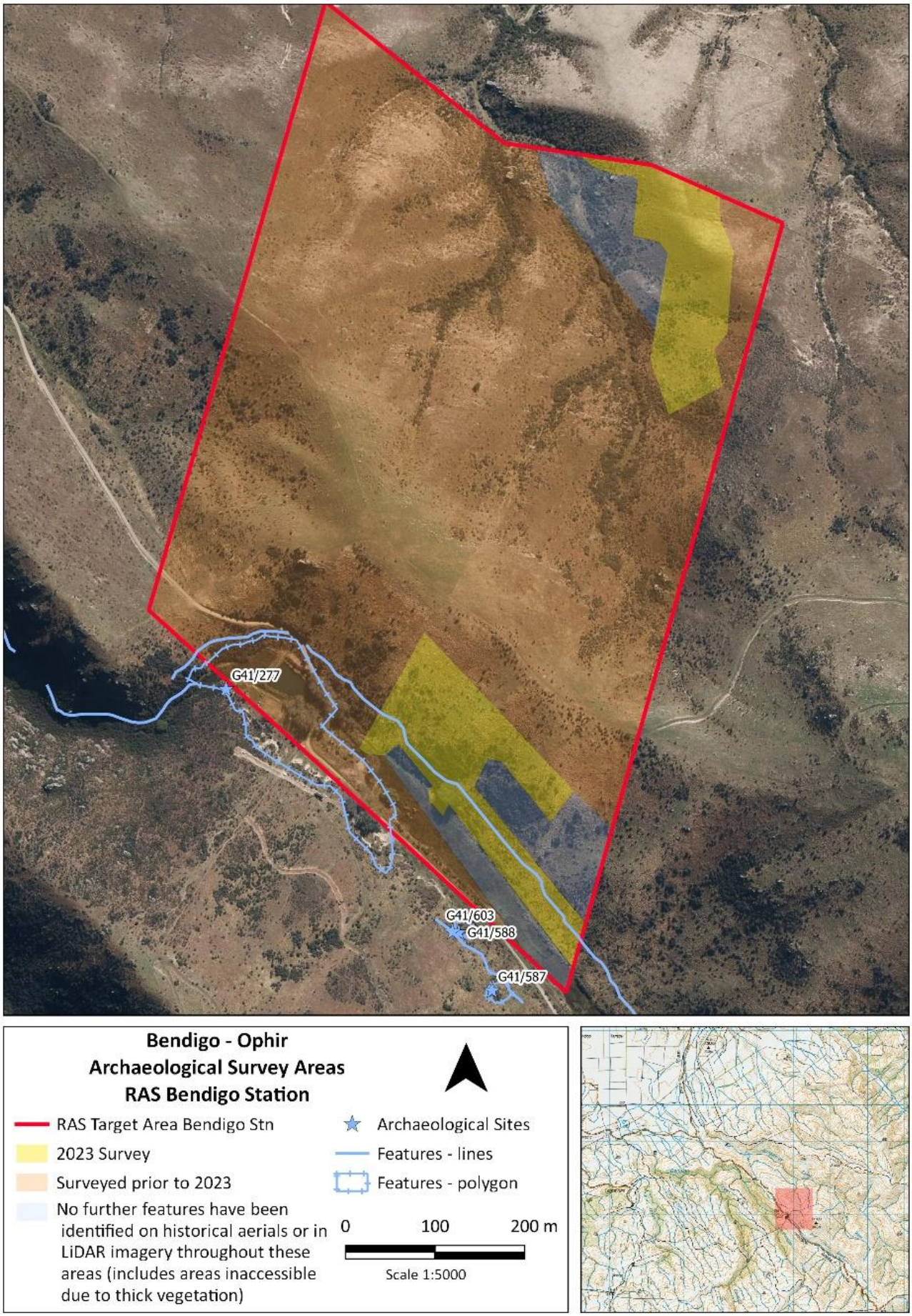

Figure 7-7. Map showing area appraised in February 2023, with survey areas and recorded archaeological sites.

Table 7-9. Table showing previously recorded sites revisited during the February 2023 survey.

Status	Archaeological site	Known Associated Activity
Previously recorded sites revisited	Rise and Shine mine and battery (G41/277)	Nineteenth and twentieth century
	Rise and Shine Water Race (G41/584)	Nineteenth century

7.7 April-May 2024 Survey

A further pedestrian survey was conducted over four days between 30 April and 3 May 2024 by Alix Muir and Claire Thorrold. This survey focused on two areas of the proposed BOGP project area not assessed during previous surveys, as well as a walkover of the Rise and Shine Creek to inspect potential earth dams identified by MGL. Some of the areas covered by this survey have since been removed from the project area. Table 7-10 summarises the survey results of the new areas surveyed. All potential earth dams inspected along the Rise and Shine Creek proved to be natural landforms.

Table 7-10. Table showing previously recorded sites revisited during the April-May 2024 survey. Sites shaded grey extend into the current project area.

Status	Archaeological site	Known Associated Activity
Previously recorded sites revisited	G41/6	Nineteenth century
	G41/585	Nineteenth century
	G41/256	Nineteenth century
	G41/257	Nineteenth century
	G41/259	Nineteenth century

7.8 December 2024 Survey

A further targeted survey was conducted over two days between the 3rd and 4th of December 2024 by Claire Thorrold. This survey used the LiDAR to target specific points of interest and potential archaeology, which were the focus of the pedestrian survey. This survey focused on two areas not assessed during previous surveys within Shepherds Valley and along the ridge (Figure 7-9). A small section of the Rise and Shine northern hillside valley was also surveyed. One new site was identified within the project area, one previously recorded site confirmed to not extend into the project area, and two potential water races were unable to be ground truthed but have been noted as potential heritage features (Figure 7-10 and Table 7-11).

Table 7-11. Table showing previously recorded sites revisited during the December 2024 survey.

Status	Archaeological site	Known Associated Activity
Previously recorded sites revisited	Rabbiter's Hut (G41/4)	Nineteenth century
	Stock Yards (G41/5)	Nineteenth century
	Water race (G41/6)	Nineteenth century
New sites recorded	Water race (G41/790)	Unknown
Potential features identified	POI 46 & 47 (potential water races)	Unknown

7.9 March 2025 Survey

A final targeted survey was conducted on 14th of March 2025 by Naomi Woods. This survey used the LiDAR to target specific points of interest and potential archaeology, which were the focus of the pedestrian survey. This survey focused on three areas not assessed during previous surveys on the alluvial flats beside Shepherds Creek, the slopes to the south of Shepherds Creek, the proposed alignment of a new road through Ardgour Station and the proposed bore field and associated pipeline (Figure 7-11). No new sites were identified, and all potential features identified on the LiDAR imagery proved to be natural or modern. Two sites with accuracy polygons that extended into the road reserve in the vicinity of the pipeline (G41/53 and G41/301) were determined to not extend into the project area, and their site record forms have been updated to reflect this.

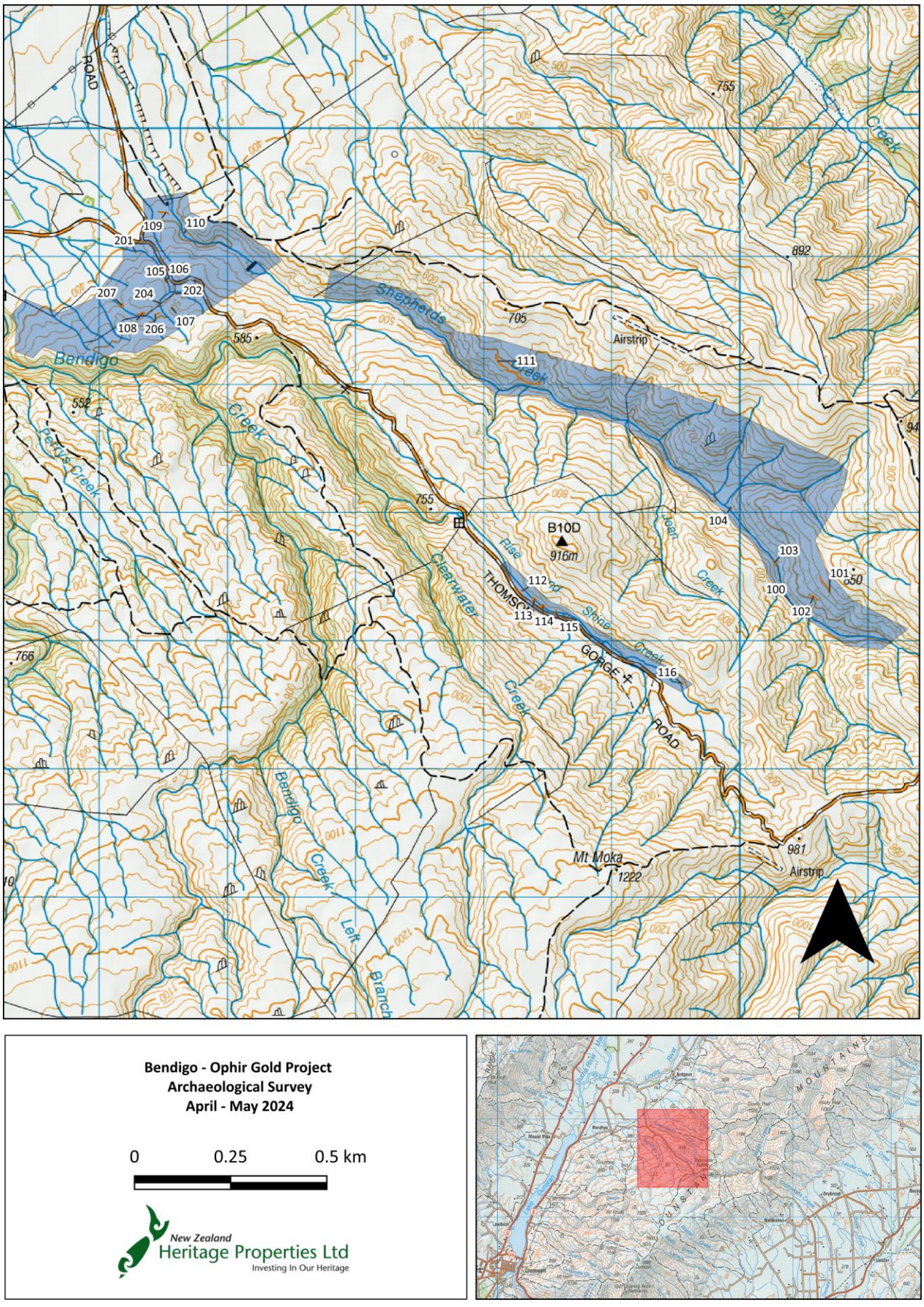

Figure 7-8. Plan showing the April - May 2024 archaeological survey area with POI labelled.

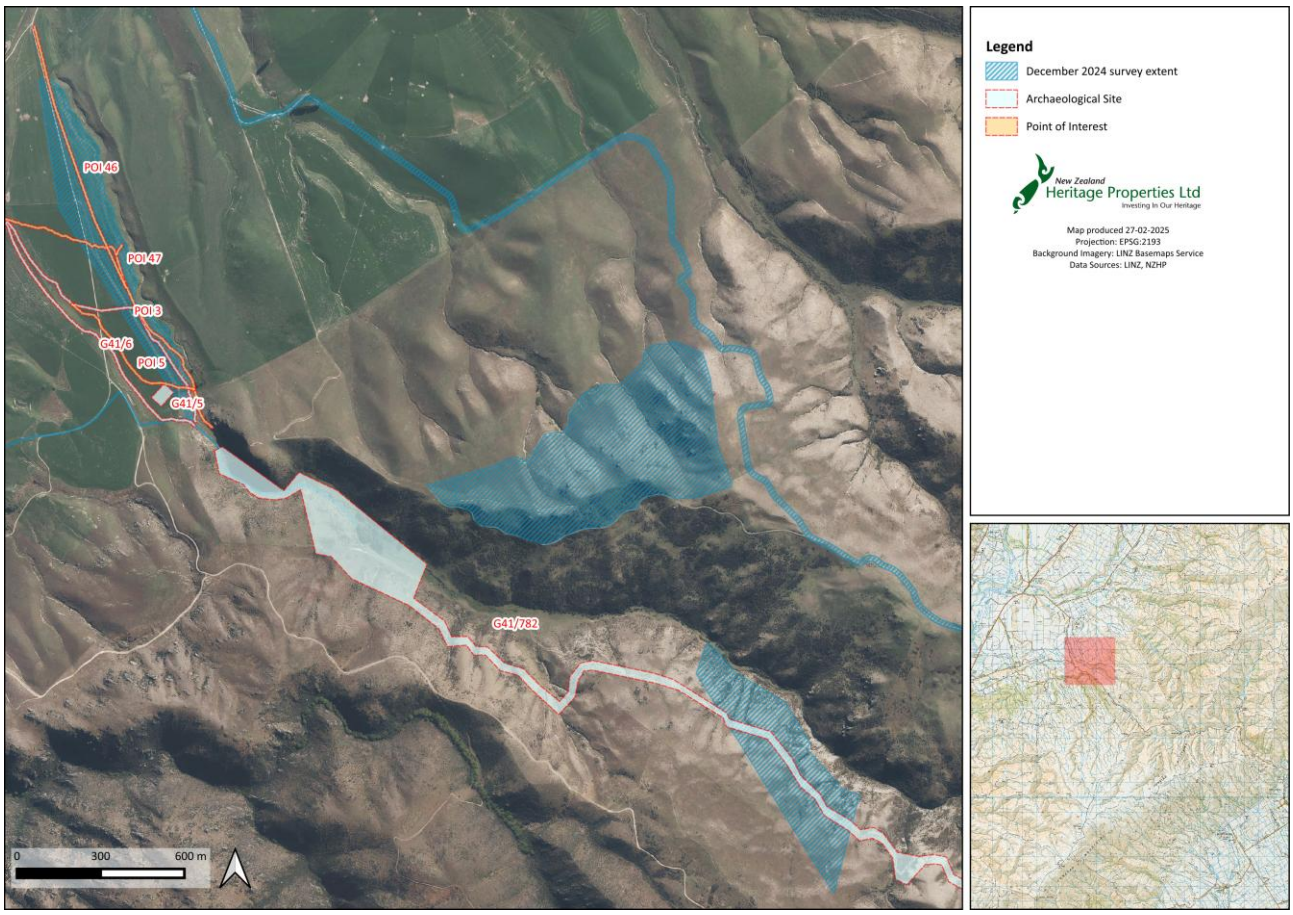

Figure 7-9. Plan showing area covered by December 2024 survey and identified sites.

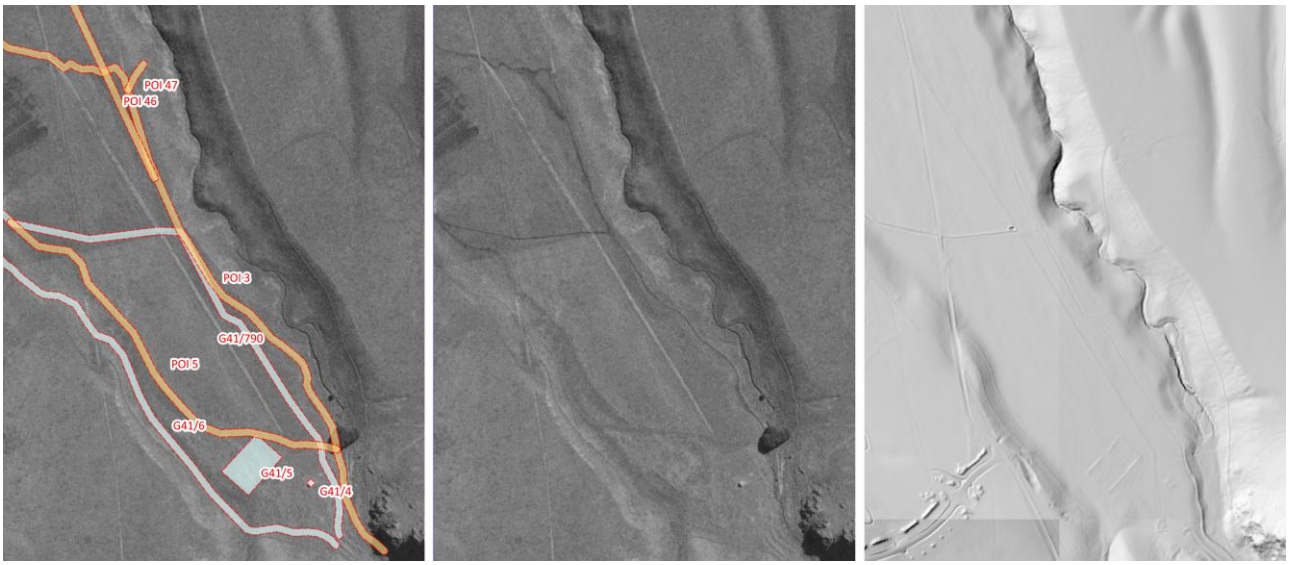

Figure 7-10. 1958 aerial (left and centre) and LiDAR imagery (right) showing identified and potential heritage sites from December 2024 survey.

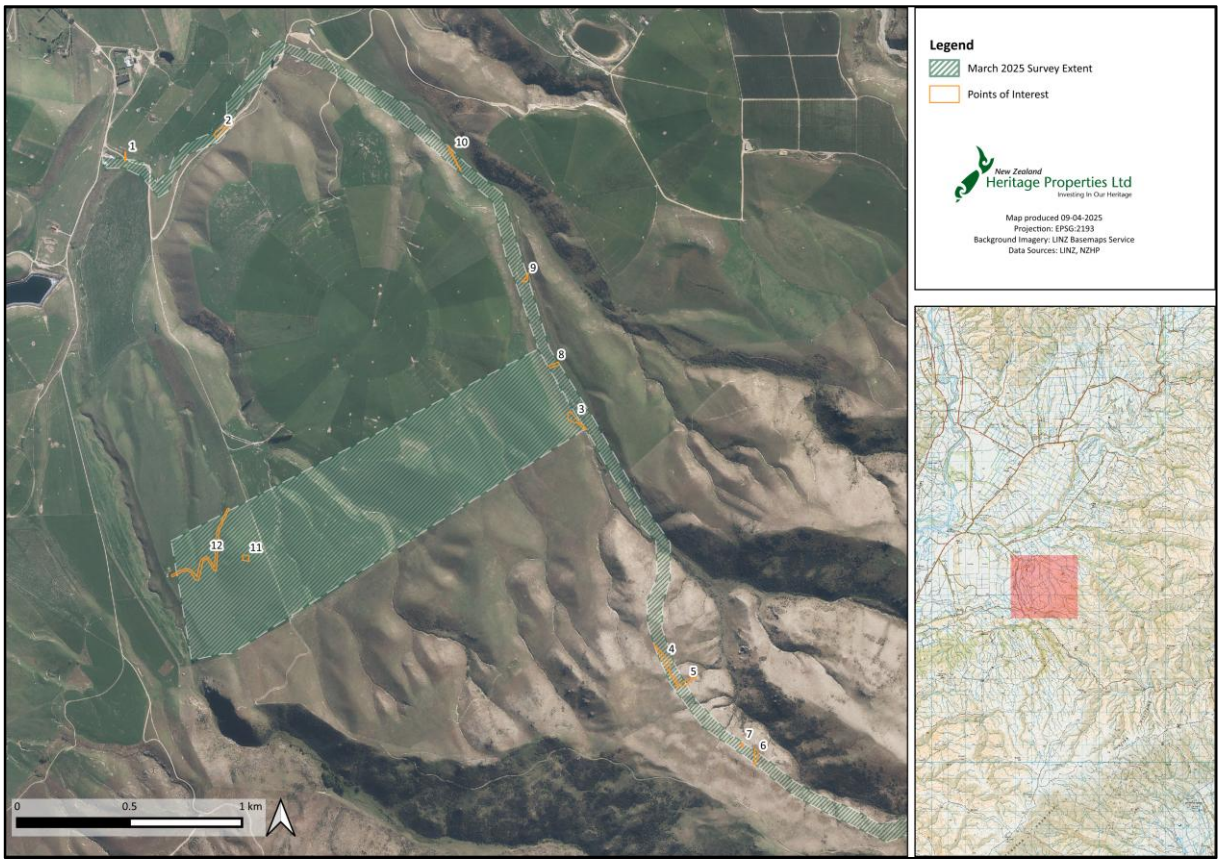

Figure 7-11. Area covered during March 2025 survey with potential heritage features identified from LiDAR and historic aerials labelled. Note this survey also included a traverse of the proposed bore field and pipeline alignment along Matilda Rise (not shown here)

7.10 Results of the Site Surveys

The following sections outline the results of site visits to the previously recorded sites as well as details of newly recorded sites. Nineteen previously recorded archaeological sites were revisited during NZHP's surveys of the project area and ten new sites were recorded on ArchSite (Table 7-12 and Table 7-13). Additional POI were initially identified using aerial photographs and LiDAR data; however, ground truthing proved these were either natural in origin or the result of modern farming activity (for example mounds of vegetation and earth created through scrub clearance using a bulldozer). The exception to this is POI 46 and 47 from the December 2024 survey which require further investigation to determine whether they are heritage features or not.

Table 7-12. Previously recorded sites within the project area.

Site No.	Site Type	Survey date	Condition notes
G41/4	Stone Hut	April 2024	Good condition
G41/5	Stock Yards	Dec 2024	Good condition
G41/6	Water Race	Dec 2024	Good condition
G41/251	Battery	Dec 2018	Good condition
G41/256	Gold workings	April 2024	Poor condition
G41/264	Gold workings	Dec 2018	Fair – some late twentieth century disturbance (root-raking, trenching, track formation)
G41/265	Stone hut	Feb 2018	The remaining sections of wall were in good condition
G41/266	Stone hut	Feb 2018	The remaining sections of wall were in good condition
G41/267	Stone hut	Feb 2018	The remaining sections of wall were in good condition
G41/269	Dam	Dec 2018	Good condition
G41/273	Stone hut	Not relocated	Unknown (overgrown)
G41/277	Battery	Feb 2023	Good condition – minor disturbance from late twentieth century mining
G41/584	Water Race	Dec 2018	Fair condition – some disturbance in upper reaches (outside of project area)
G41/586	Water race	Dec 2018	Good condition
G41/589	Revetted road	Dec 2018	Good condition
G41/604	Gold working	Feb 2018	Good condition
G41/605	Gold working	Feb 2018	Some disturbance by late twentieth century track formation, otherwise good

G41/606	Stone hut	Not relocated	Unknown (overgrown)

Table 7-13. New heritage sites identified within the project area.

Site No.	Site Type	Survey date	Condition notes
G41/658	Hut terrace	Feb 2018	Good condition
G41/782	Road	Aug 2021	Good condition, many features intact
G41/783	Track	Dec 2018	Fair condition
G41/784	Hut Terrace	Dec 2018	Fair condition
G41/785	Hut site	Aug 2022	Mounds and fireplace in good condition
G41/786	Hut site	Aug 2022	Fair condition
G41/787	Tailings	Dec 2018	Fair condition, overgrown
G41/788	Tailings	Aug 2022	Good condition
G41/789	Sluicing	Aug 2022	Fair condition, overgrown
G41/790	Water race	Dec 2024	Fair condition

7.10.1 Site G41/4 (Rabbiter's Hut)

Site G41/4 is known to locals as Rabbiter's Hut, though it was originally built as a shepherd's cottage in the mid-nineteenth century. This hut was visited in 2024 and has been modified since it was last described by Hamel (1993). Though we do not have previous photographs of this hut, the footprint can be seen to have been extended when compared with Hamel's sketch plan (Figure 6-3), with a corrugated iron lean-to added on the south elevation (Figure 7-13 and Figure 7-14). The glazing has been replaced as well as potentially the roof, the chimney brought down to roof level, and a modern flue installed. These modifications have altered heritage fabric; however, they have preserved the hut as a functioning building, one that is still in use by farm staff today.

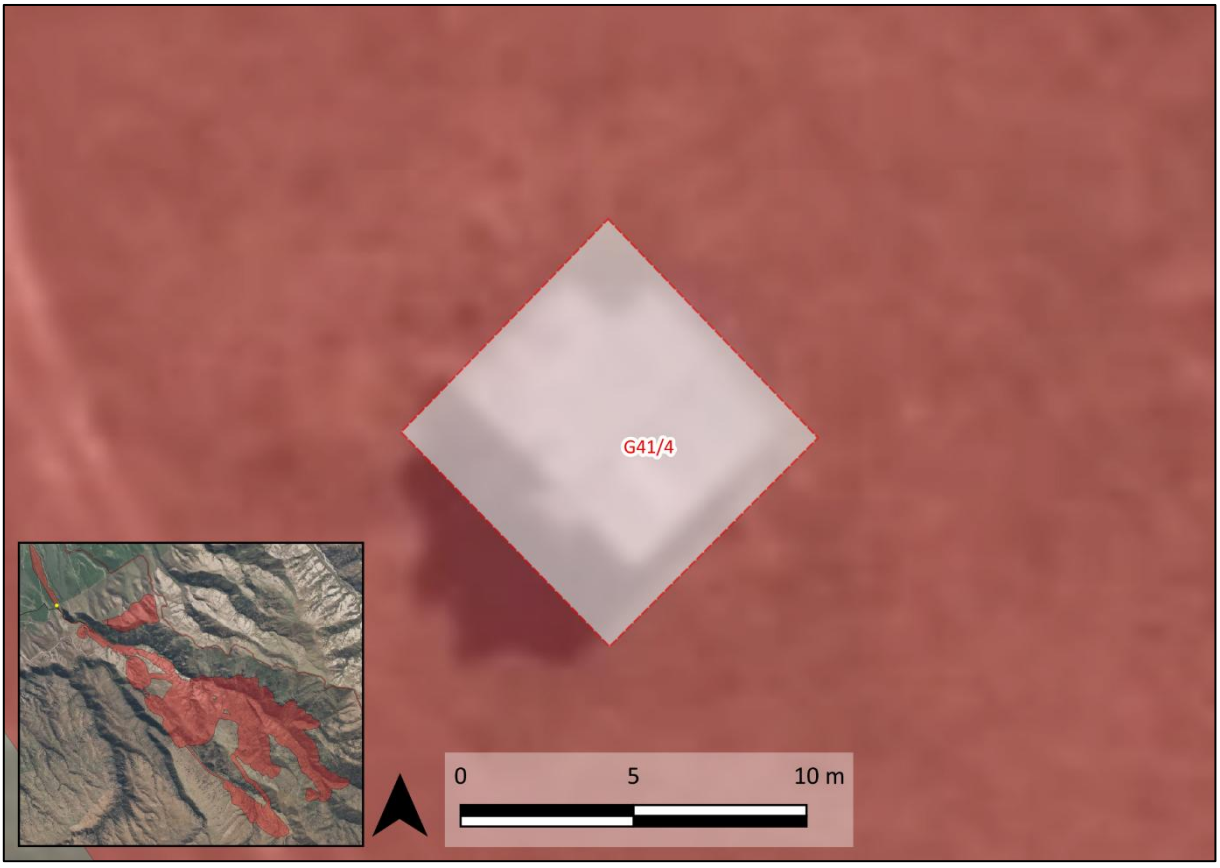

Figure 7-12. Location of Site G41/4 (Project area is shown in red).

Figure 7-13. Site G41/4 in 2024, looking east.

Figure 7-14. Site G41/4 in 2024, looking north.

7.10.2 Site G41/5 (Stock Yards)

Site G41/5 was visited during the April and December 2024 surveys, with additional photographs taken in March 2025 (Figure 7-16 and Figure 7-17). The site is bounded by a modern post and wire fence to keep stock out and is

in good condition. All the features previously described by Hamel were easily identified and the walls are intact. In March 2025 long grass covered the site.

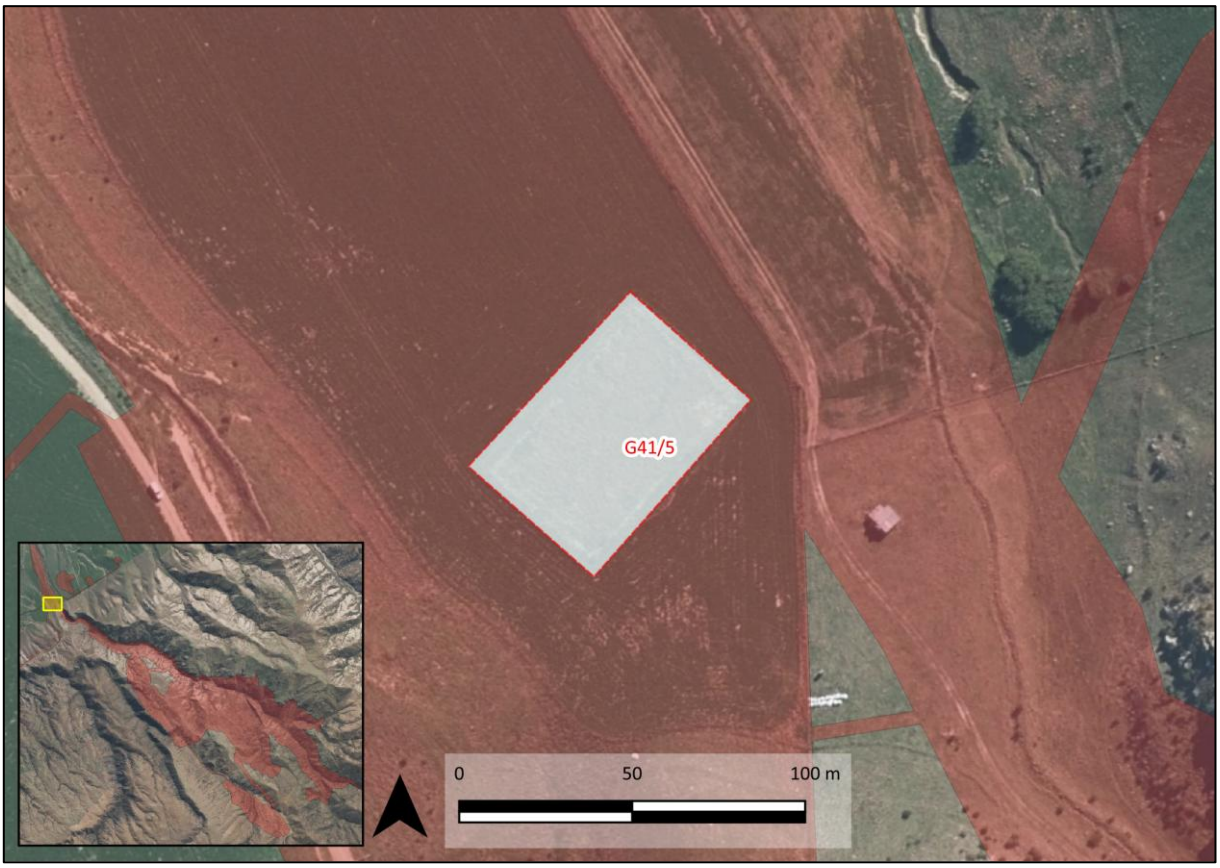

Figure 7-15. Location of Site G41/5 (Project area is shown in red).

7.10.3 Site G41/6 (Water Race)

Previously recorded site G41/6 (Figure 7-18 and Figure 7-19) is a water race that was located and recorded as POI 206 on April/May 2024 and again as POI 108 in December 2024. This race extended outside of the project area to the northwest and seemed to disappear where it has been disturbed by the modern road at the southern extent of the project area. Where visible, the race was 800mm-1m wide and 500-800mm high. The race is approximately 1055m long.

7.10.4 Site G41/251 (Come-in-Time Battery)

Site G41/251 is the Come-in-Time battery and surrounding features in use between 1880 and the early 1900s (Figure 6-4 and Figure 7-21). The current battery at the site was installed in the early twentieth century and was restored in 2005. It is enveloped by three stone walls, to which two stone tracks lead. The restoration included, removal of rotting timbers, partial reconstruction of a collapsed stone wall (the northern wall around the battery), and a pelton wheel was brought onto site to replace the lost original. Approximately 80 m up the gully a mine drive is present which has been dug out horizontally into the hillside. This is the main drive of what was known as the Red Mine (Figure 7-23). A second adit 30 m east of the first, is also recorded, and it is only this feature that sits within the current project area. Some of the schist revetments of the pathways were noted to have partially collapsed during the 2018 survey (Figure 7-24).

Figure 7-16. Looking southeast at Site G41/5, March 2025.

Figure 7-17. Details of stone walls at site G41/5, March 2025.

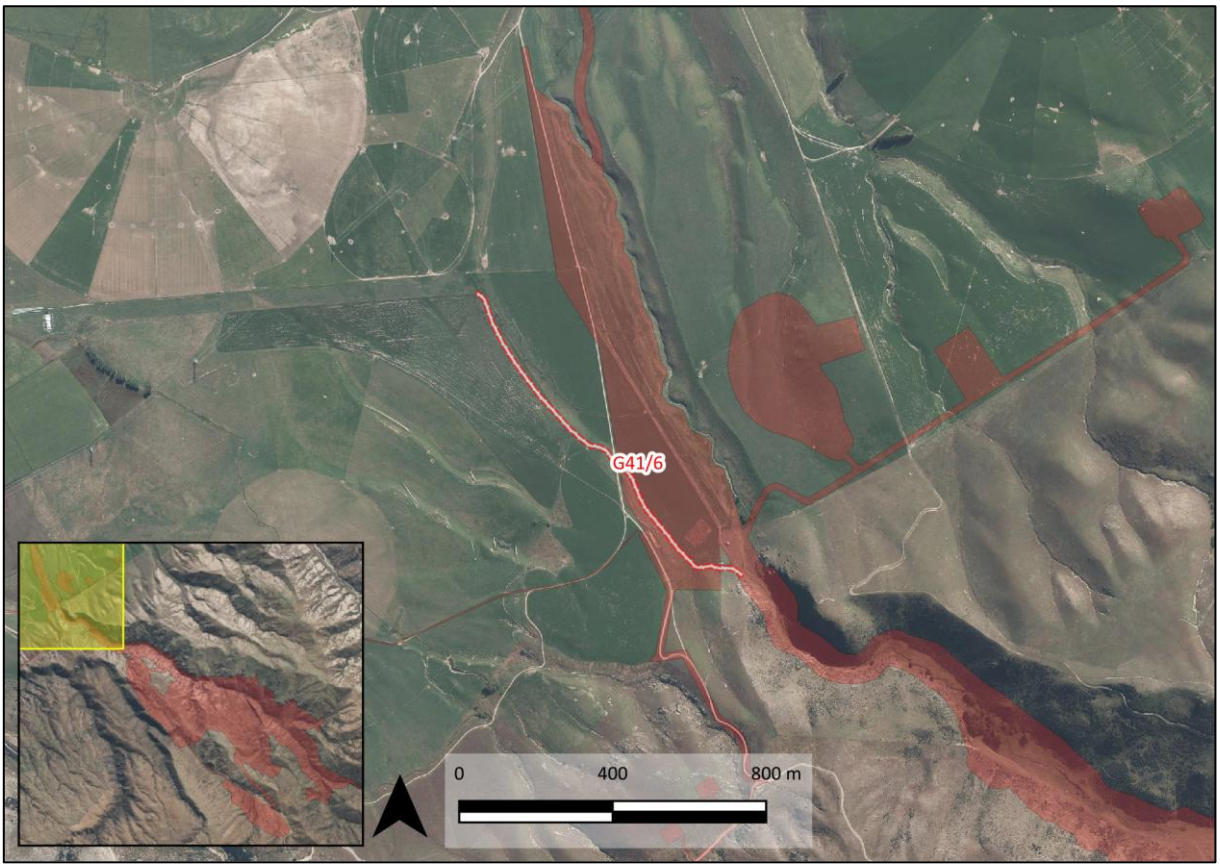

Figure 7-18. Location of Site G41/6 (Project area is shown in red).

Figure 7-19. Photograph showing the G41/6 water race, looking east towards the project area.

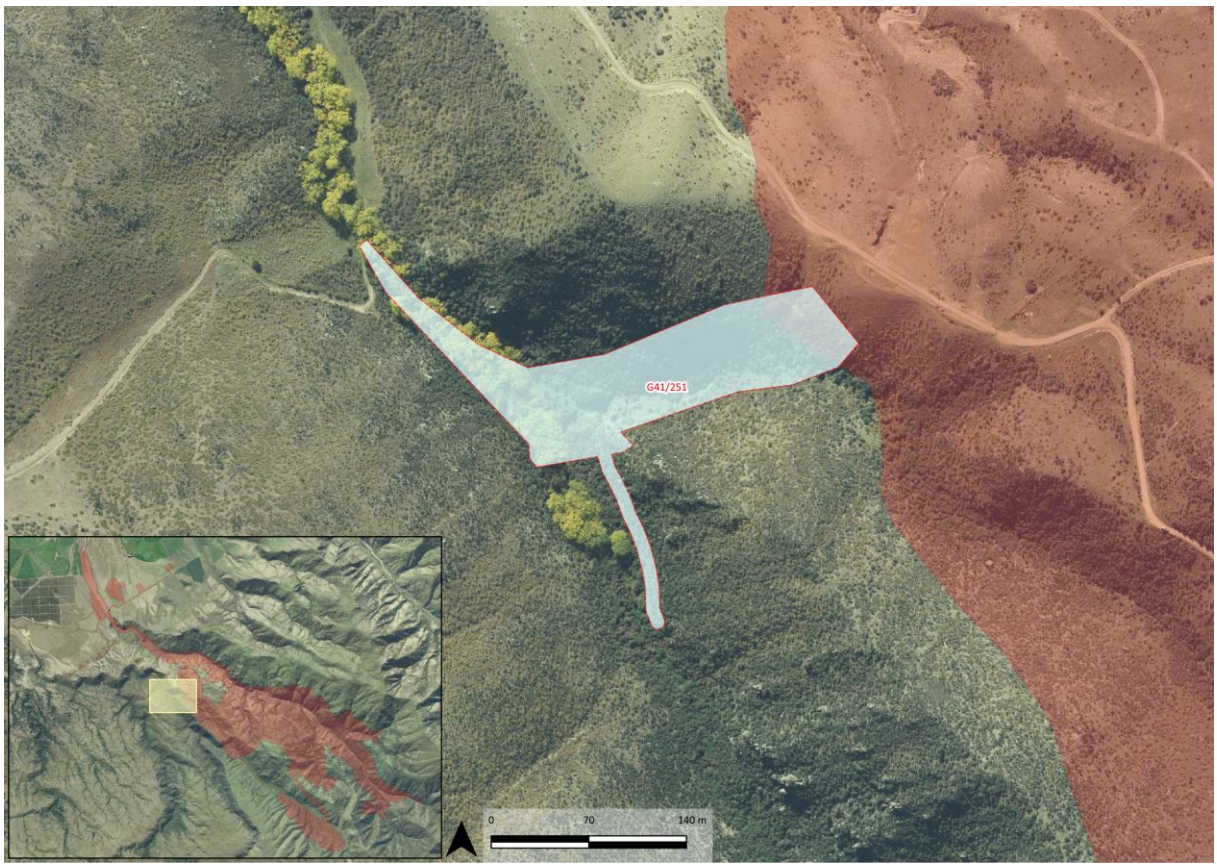

Figure 7-20. Location of G41/251. Project area is shown in red.

Figure 7-21 Photograph looking southeast at the Come-in-Time battery recorded as G41/251. Phoebe Scrivener is shown in front of the battery.

Figure 7-22 Photograph looking southwest at the schist channelling at the end of the Come-in-Time water race recorded as part of G41/251.

Figure 7-23 Photograph looking north at the main adit of the Red Mine recorded as part of G41/251.

Figure 7-24 Photograph looking north at the partially collapsed stone revetment recorded as part of G41/251.

7.10.5 Site G41/256 (Gold Workings)

Tailings mounds and sluice face from this site were identified in the creek bed heading northwest down the hillside during the April-May 2024 survey (Figure 7-26, Figure 7-27). The site is located approximately 75m southeast of the farmer's track of Thomson Gorge Road. The tailings mound was approximately 7m long and 2m wide, rising up approximately 1.5m from the creek bed floor. The tailings mound is partially obscured by vegetation, with the mound potentially continuing further southeast up the creek bed. The tailings are in good condition; however, the original site record also includes an earth dam which was not visible on the ground. The sluice face identified was approximately 6m wide and 2m long (Figure 7-28). The dam and obvious areas of sluicing are, however, clearly visible in the LiDAR imagery and the site extent has been updated based on a combination of pedestrian survey and LiDAR results.

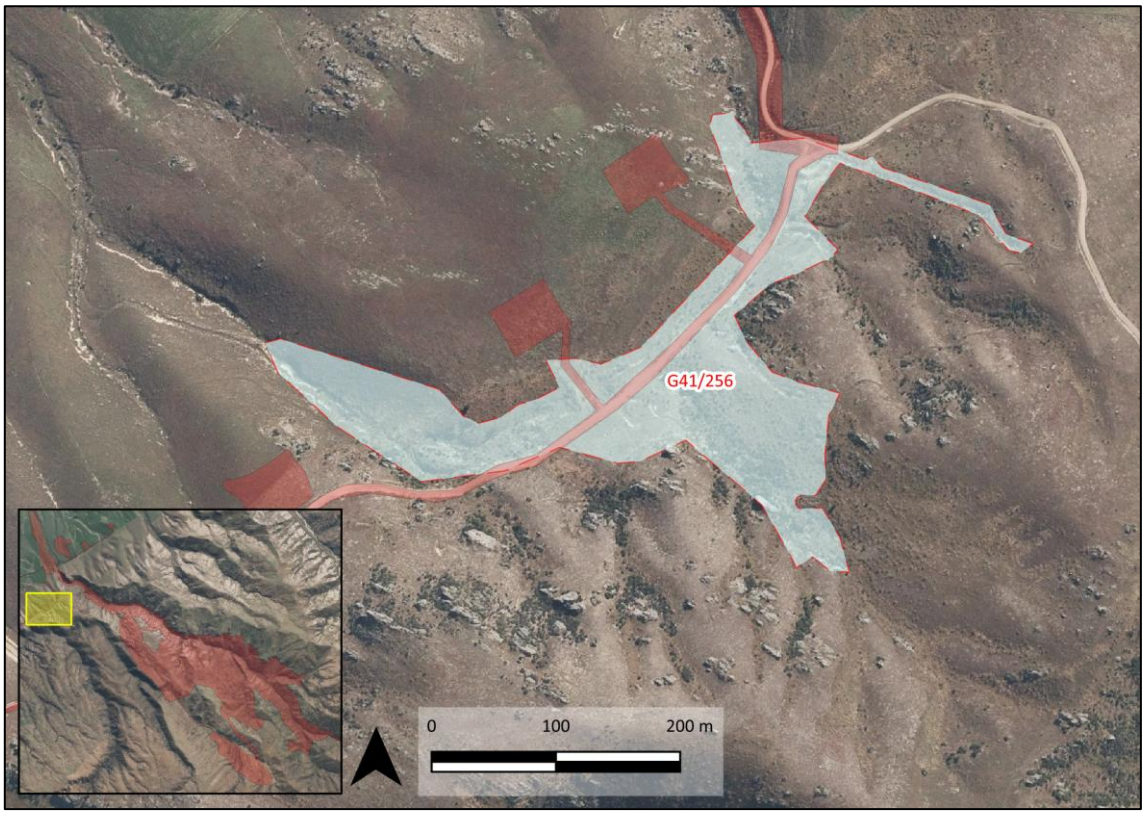

Figure 7-25. Location of site G41/256 with project area shown in red.

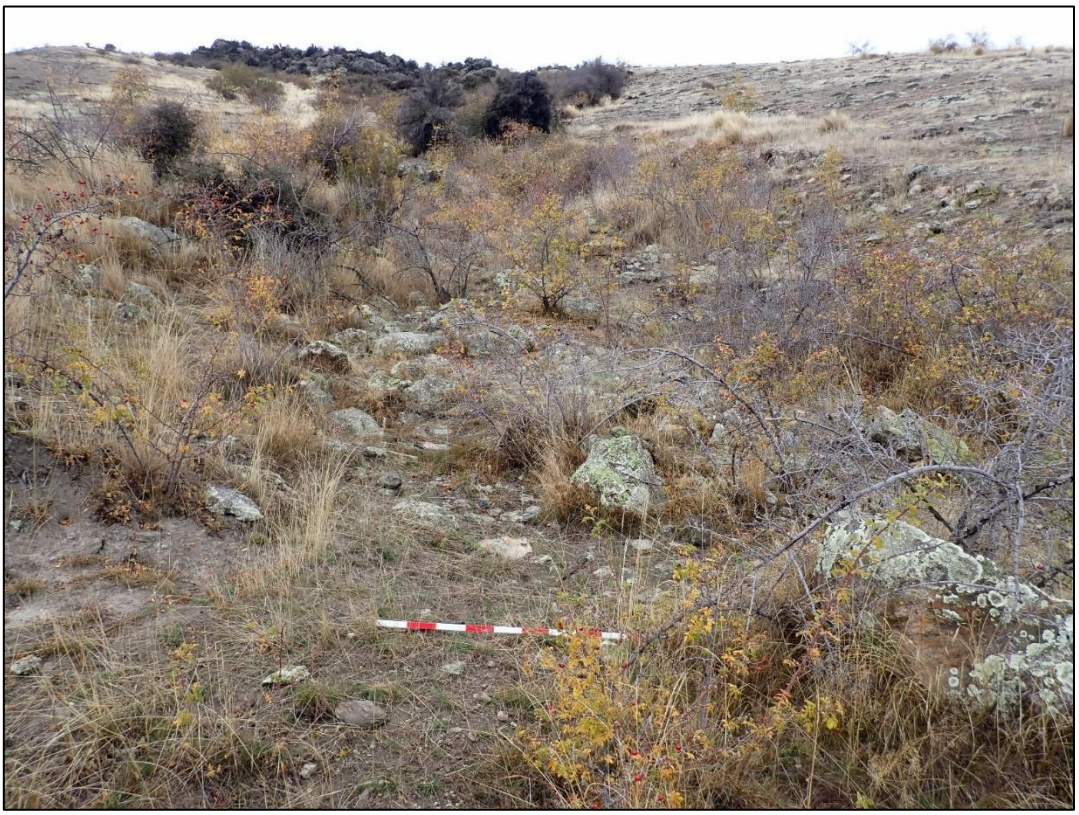

Figure 7-26. Photograph showing the tailing mound, looking southeast (NZHP, 2024).

Figure 7-27. Photograph showing the tailing mound, looking northwest with the farmers track in the background (NZHP, 2024).

Figure 7-28. Photograph of the possible sluice face, looking west (NZHP, 2024).

7.10.6 Site G41/264 (Rise and Shine Workings)

The initial SRF for this site records a large area of alluvial workings along the Rise and Shine Creek (Figure 6-7 and Figure 6-8), predominantly associated with the 1860s operations of the Rise and Shine Syndicate. The features

of the site include small tailings mounds scattered across the alluvial flats, some with revetted channelling and sluicing in the gullies run down towards the creek. Later additions to the SRF by Nichol and Wright (2006) included two dams, barrel hoops, a collapsed adit, tailings and sluicing areas. There have been modern mining works undertaken throughout this site including root raking, drill holes, trenching and pitting from the mid-1980s through into the twentieth century. These works have likely modified and damaged the site. In spite of this, given the extensive covering of the site, many features remain intact. The site was revisited during the 2017 and 2018 surveys and additional tailings associated with the site were identified (Figure 7-30). These tailings were located along the valley floor, immediately north of Thomson Gorge Road, spread over an area of 160m (POI 180, 257 and 258). Further aerials and LiDAR imagery show that the site and sluicing areas extends further up the hills of the valley as shown in Hamel's (1993) plans (Figure 6-7 and Figure 6-8), with tailings identified on the ground on these slopes during the December 2018 survey.

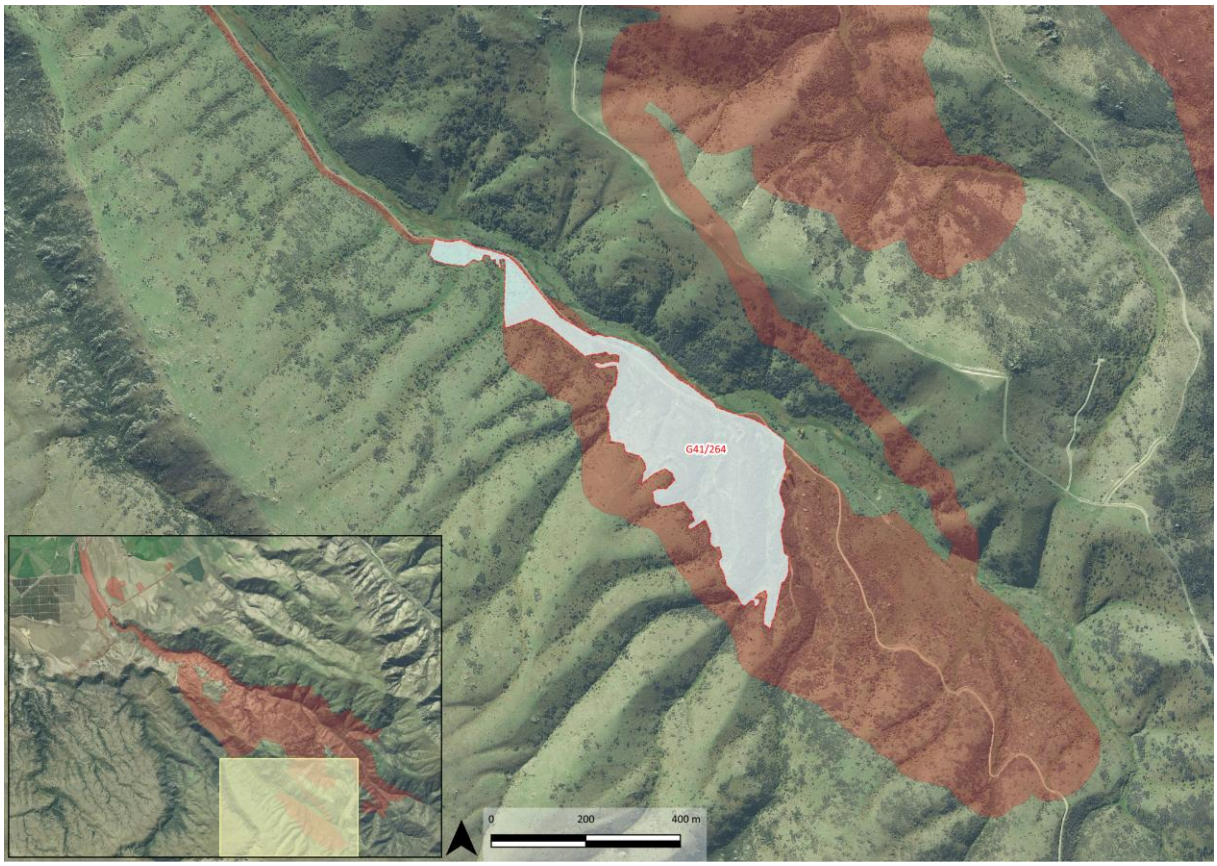

Figure 7-29. Location of G41/264. Project area is shown in red.

Figure 7-30 Photograph looking southeast at the tailings recorded as part of G41/264.

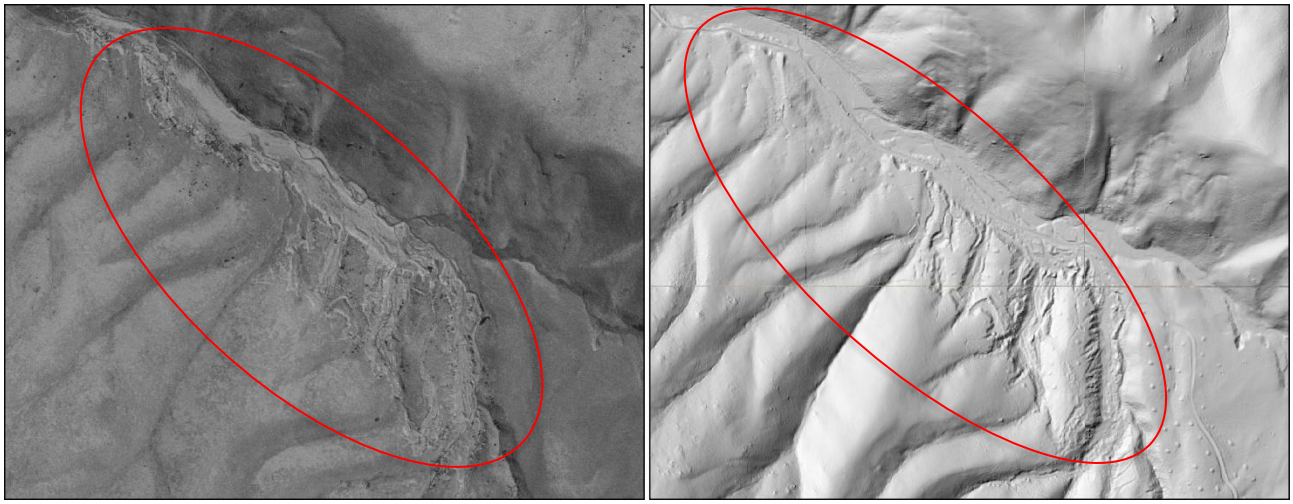

Figure 7-31 1958 Aerial photograph (left) and LiDAR imagery (right) showing gold mining workings recorded as G41/264 (red circle).

7.10.7 Sites G41/265, G41/266 and G41/267 (Stone Huts)

Three previously recorded stone huts (G41/265, 266 and 267) sit within the extent of gold mining complex G41/264 and were revisited during the February 2018 survey and during a 2025 site visit with HNZPT. The location data, description and condition were found to be consistent with the SRFs for each site as recorded in 2005. Dense matagouri and briar rose made photographing sites G41/266 and G41/267 difficult (Figure 7-32), and a modern access track passed close to each; however, they remain in the conditions as described in their SRFs and as shown in Hamel's 1990 photograph (Figure 6-12). Site G41/265 (Figure 7-33 and Figure 7-34) was modified by the installation of the early 1980s fence line as described in the 2005 SRF, but no further damage was noted. This hut is visible on historic aerials and the 2018 LiDAR imagery (Figure 7-35). The other two huts are less obvious, but vague surface anomalies are present in their recorded locations (Figure 7-36 and Figure 7-37).

Figure 7-32. Looking south towards sites G41/266 and G41/267, with their approximate locations indicated by the red arrows.

Figure 7-33. Location of G41/265. Project area is shown in red.

Figure 7-34. Site G41/265 looking northwest. Note modern fence in foreground.

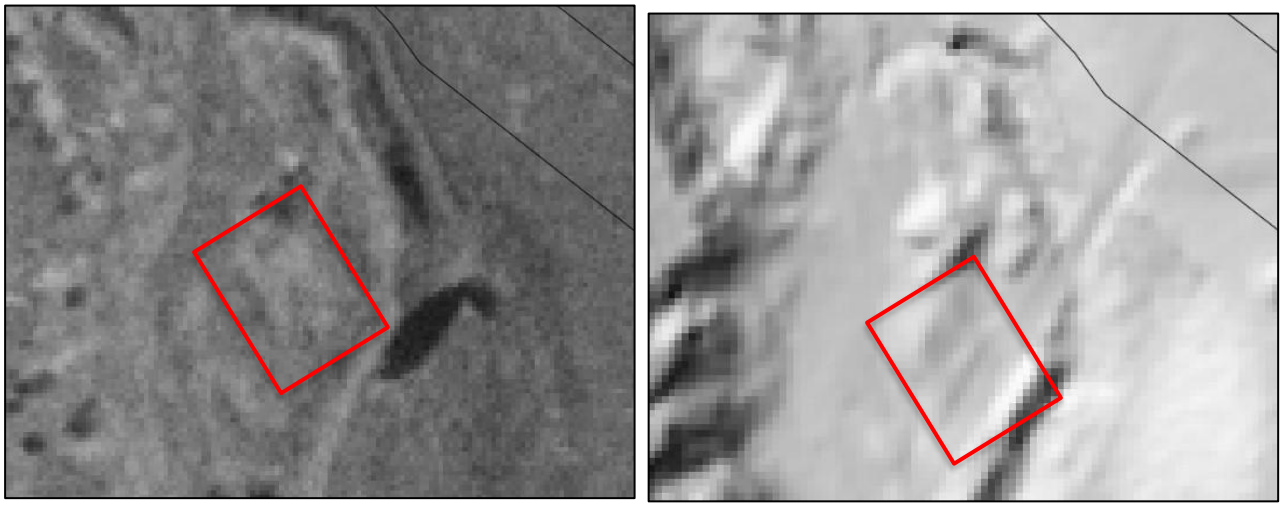

Figure 7-35. Detail of 1958 aerial showing hut G41/265 (outlined in red). Right: LiDAR imagery with hut G41/265 now cut by modern fence line.

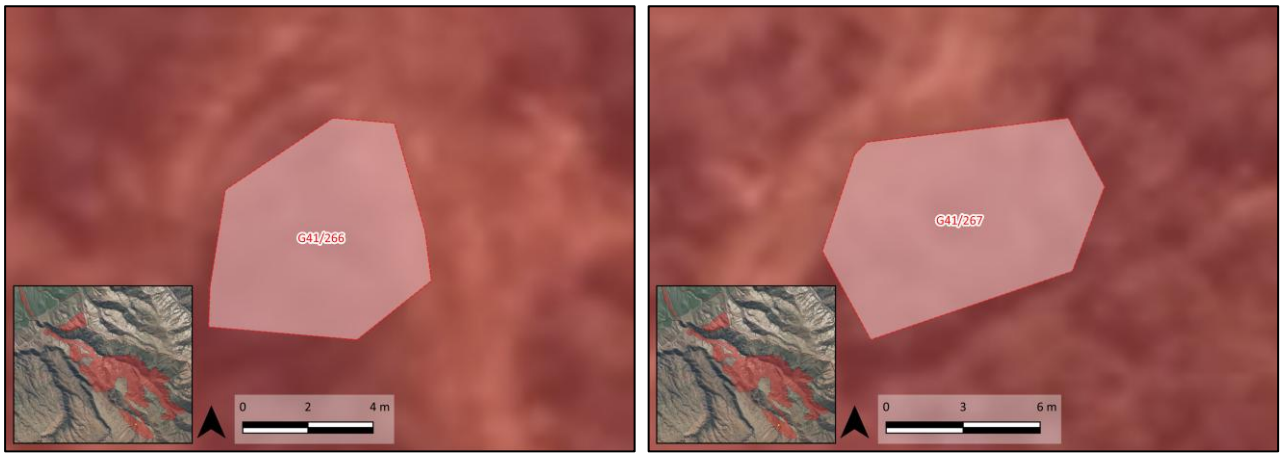

Figure 7-36. Location of G41/266 (left) and G41/267 (right). Project area is shown in red.

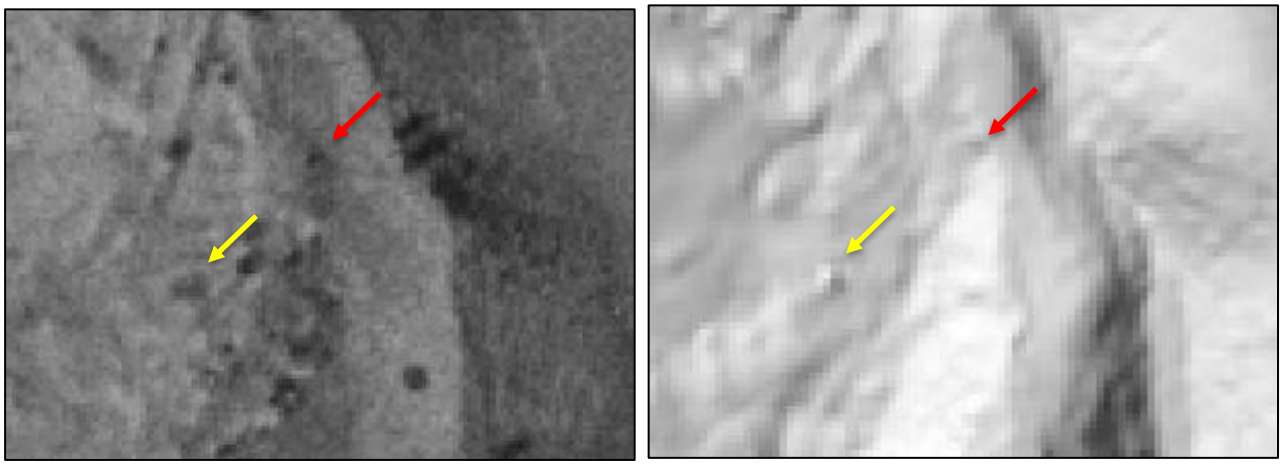

Figure 7-37. 1958 Aerial photograph (left) and LiDAR imagery (right) showing anomalies in location of hut G41/266 (red arrow) and G41/267 (yellow arrow).

7.10.8 Site G41/269 (Rise and Shine Dam)

The dam recorded as G41/269 (Figure 7-38 and Figure 7-39) was revisited during the November 2017 and both 2018 surveys and during a 2025 site visit with HNZPT. The stone revetted dam face was in good condition and the site was as described in the SRF (Figure 6-16). The dam is clearly visible in 1950s aerials and LiDAR imagery as shown in Figure 7-39.

Figure 7-38. Looking south at G41/269, November 2017.

Figure 7-39. Photograph looking south at the stone revetted bank of the dam recorded as G41/269, taken December 2018.

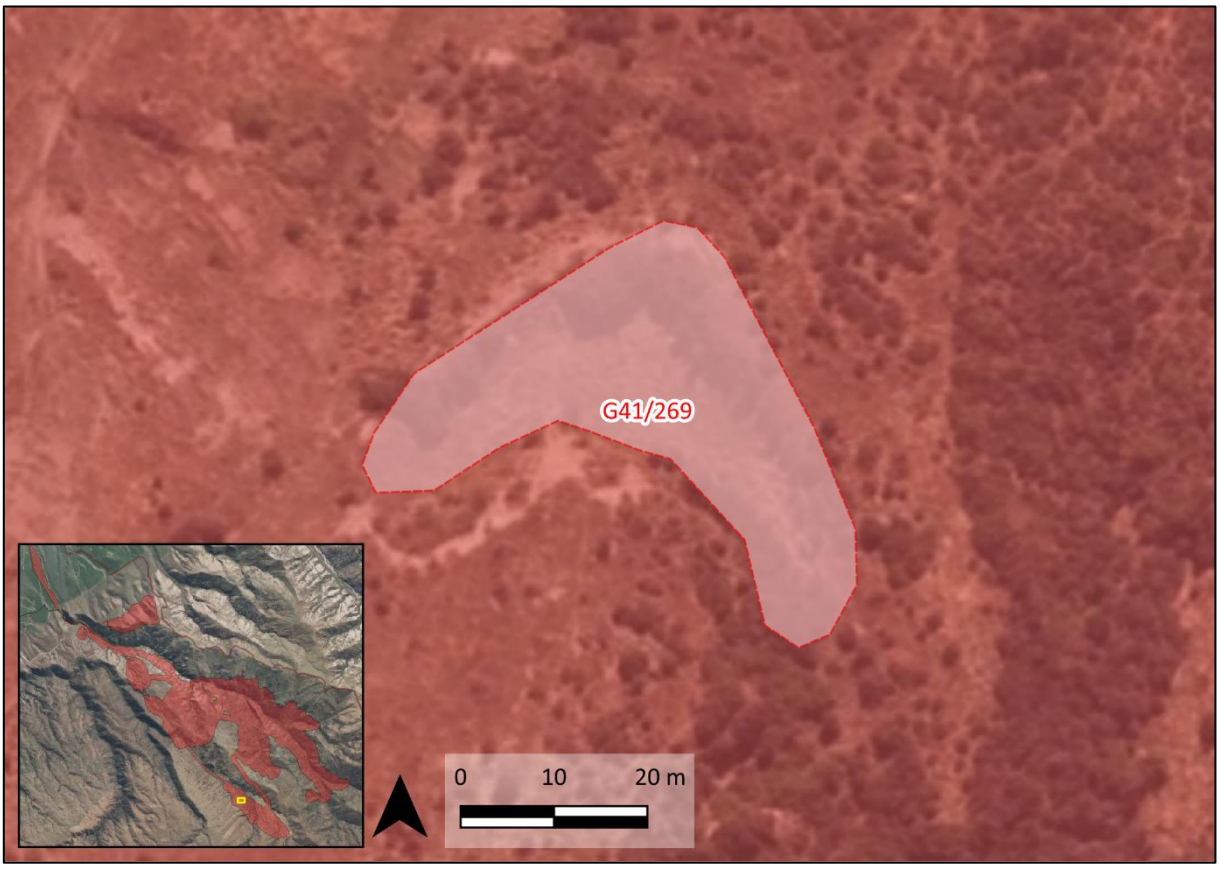

Figure 7-40. Location of G41/269. Project area is shown in red.

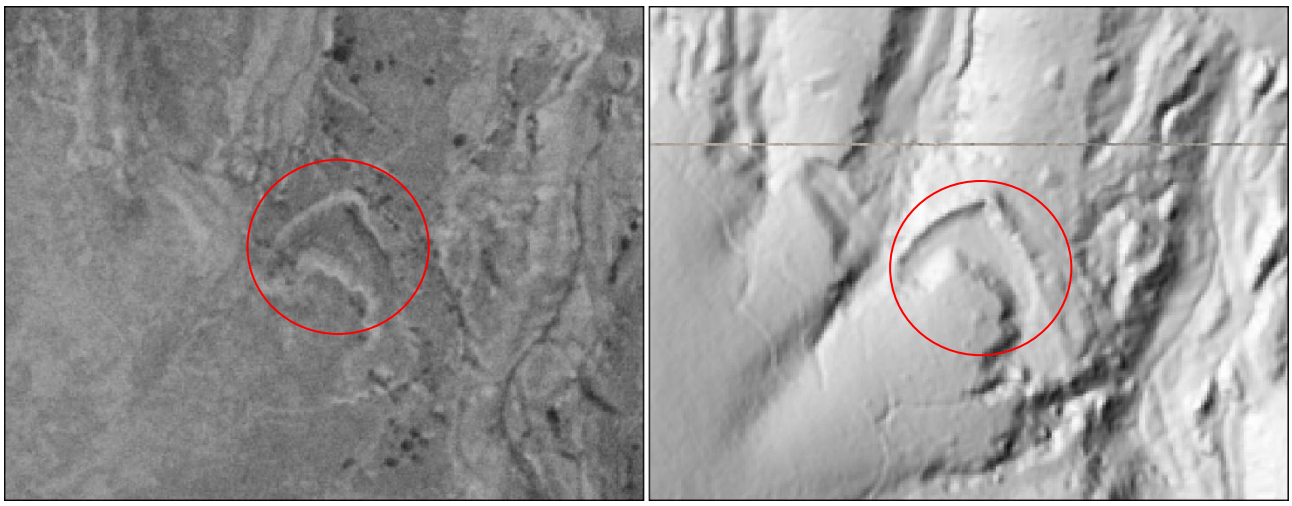

Figure 7-41. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of the dam (G41/269) circled red.

7.10.9 Sites G41/273 and G41/606 (Stone Huts)

The two collapsed schist hut sites G41/273 and G41/606 southeast of the Thomson Gorge Road were not able to be relocated during any of NZHP's surveys. Overgrown vegetation likely obscured the remains of these sites, which comprise low stone wall and chimney remnants and low mounds of rubble. The two huts are, however, visible in 1950s aerials and LiDAR imagery as shown in Figure 7-43.

Figure 7-42. Location of G41/273 (left) and G41/606 (right). Project area is shown in red.

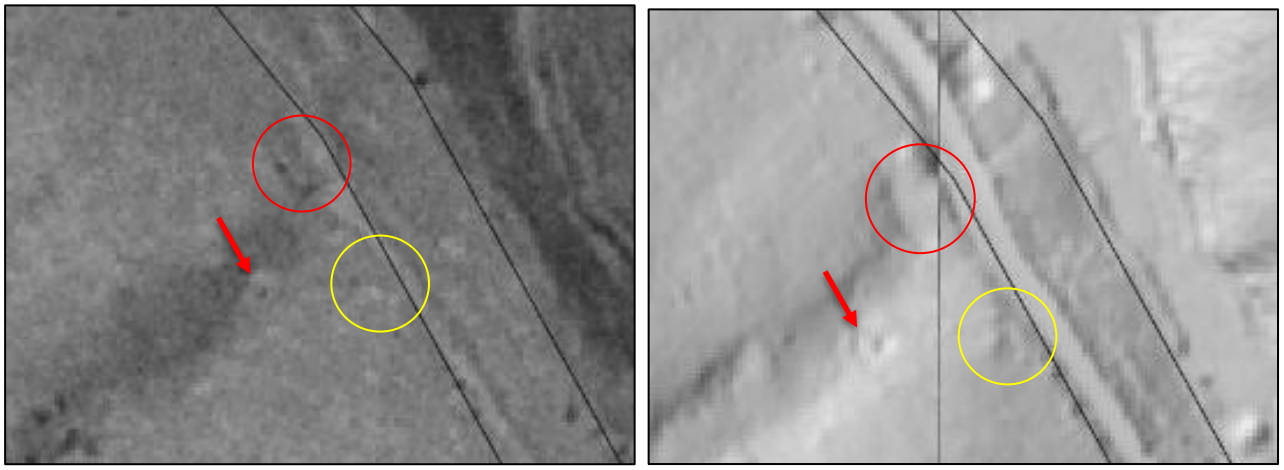

Figure 7-43. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of site G41/273 (circled red) and site G41/606 (circled yellow). The red arrow indicates a more intact hut site (G41/272) that sits outside the project area.

7.10.10 Site G41/277 (Rise and Shine Mine and Battery)

The initial SRF records machine foundations, tailings, a reservoir or dam, and a revetted roadway leading downstream on the true right. This site has been subject to more recent mining activity disturbance such as drill holes undertaken in the 1980s through to the 2000s. However, the site was walked over and appeared in good condition aside from heavy vegetation. The revetted roadway or tramway was re-identified during the site survey (POI 203). The southeast extent of the tramway was heavily vegetated, and it was not possible to completely view its full extent as identified in the 1980 survey. Aerial imagery shows the road running for 291m along the Rise and Shine Creek (Figure 7-47). The tramway revetment was built using schist stones, occasionally incorporating or built around larger in situ natural schist outcrops (Figure 7-45). Historic photographs of this area show 1930s buildings (Figure 5-7 and Figure 5-8), however no remains of these buildings were identified during the survey.

Additional points of interest were identified in the LiDAR imagery immediately to the south of G41/277. These surface anomalies are consistent with goldmining workings, with one area extending all they to the southern end of G41/277 (POI 319 to 322 and 331 to 335; Figure 7-48; Figure 7-49) and tailings on the southwest slope above the Rise and Shine Creek (POI 171 to 173; Figure 7-50 and Figure 7-49). These workings may also relate to more recent early twentieth century mining as well as more recent mining from the 1980s onwards.

Figure 7-44 Photographs looking southwest at mine recorded as G41/277. Photographs show concrete machine foundations, adit, stone faced dam and sluice face.

Figure 7-45 Photographs looking northwest (left) and north (right) of revetted tramway recorded as part of G41/277.

Figure 7-46. Recorded extent of site G41/277. Project area is shown in red.

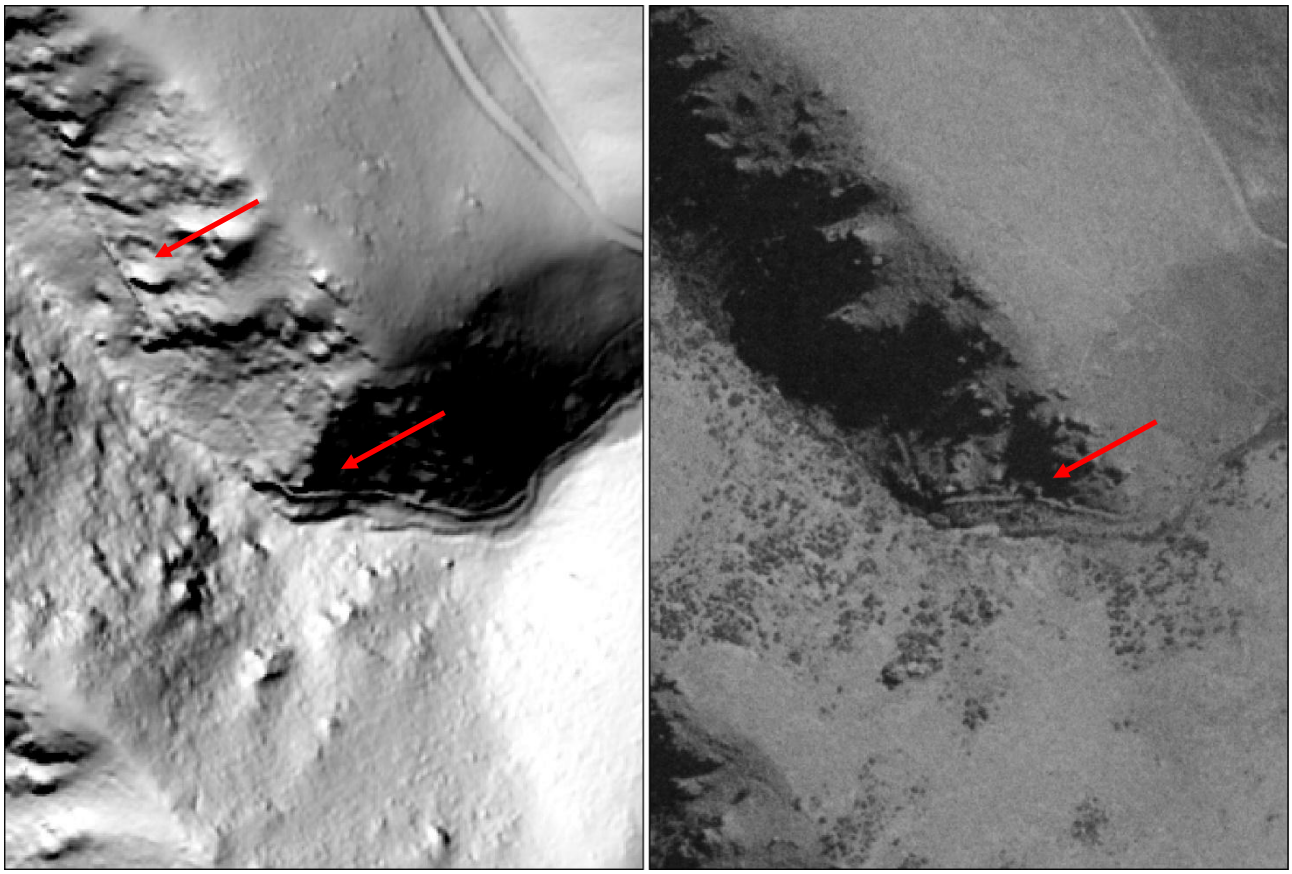

Figure 7-47. LiDAR imagery (left) 1958 Aerial photograph (right) and showing road along the Rise and shine creek associated with G41/277.

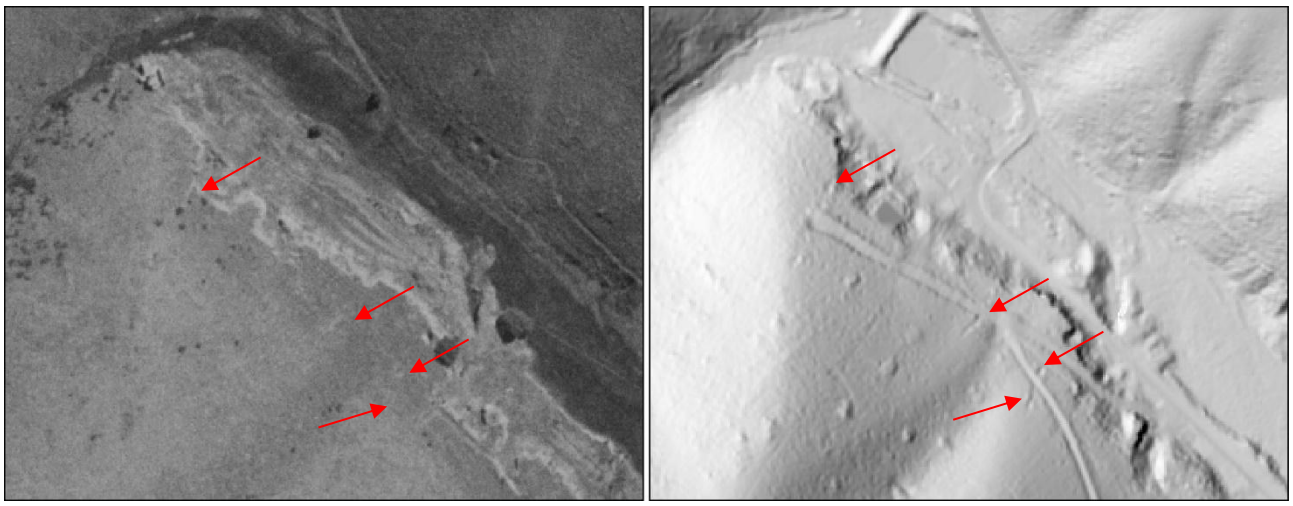

Figure 7-48. 1958 aerial photograph (left) and LiDAR imagery showing possible gold workings (red arrows: POI 331-334) along the northeast and southwest side of the Rise and Shine Valley.

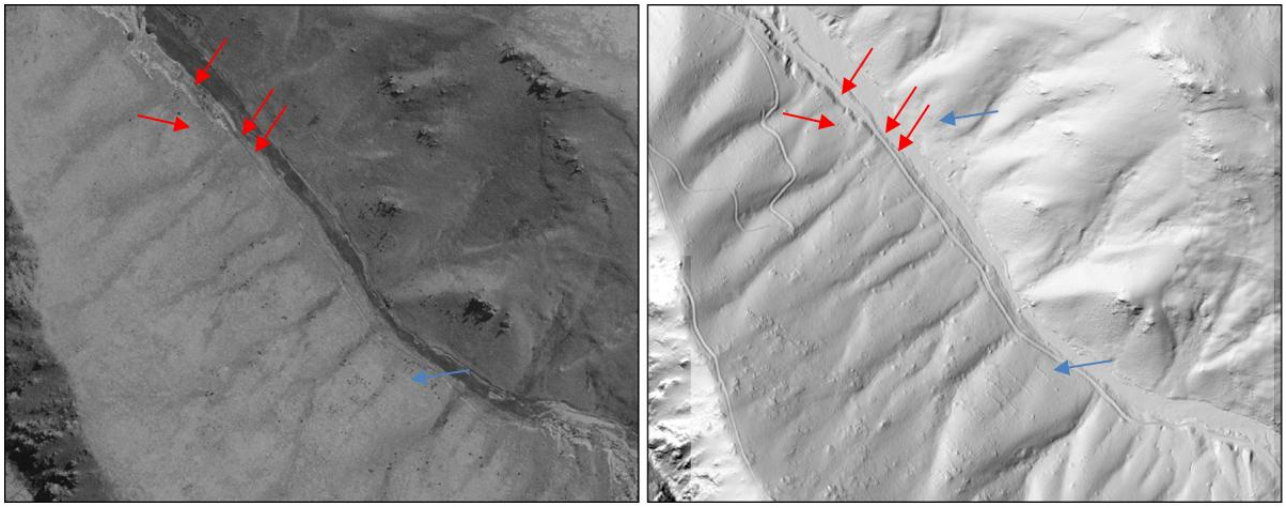

Figure 7-49. 1958 aerial photograph (left) and LiDAR imagery (right) showing possible tailing (blue arrows: POI 325 and 326) areas, and other possible gold workings (red arrows: POI 331-334) along the northeast and southwest side of the Rise and Shine Valley.

7.10.11 Site G41/584 (Rise and Shine Water Race)

Two sections of the site were revisited during the surveys. The race appeared in good condition around Mount Moka (outside of the current project area), where it is presently covered in low grass and tussock (Figure 7-52). This portion of the race is visible in survey plan SO 1204, dating to 1909 (Figure 5-14). Once over the Thomsons Saddle the race has been damaged, likely through erosion, stock trampling, vegetation growth and the formation of Thomson Gorge Road and the access road to the top of Mount Moka. However, the LiDAR images show the race dropping towards a valley which would have directed the water to the Rise and Shine Creek (Figure 7-53).

The lower section of the race recorded by Nichol and Wright (2006) was followed further east, and it extended approximately 80m further than initially recorded, extending into the current project area. The race was heavily overgrown yet, unlike the extent around Mt Moka, this section of the race still had a noticeable channel (Figure 7-54). The full extent of the race identified by Nichol and Wright (2006) was not walked over; however, it is visible in aerial photographs and LiDAR of the area. Certain sections of the race run through modern root rake areas. While there was likely some damage to the site as a result of this work, LiDAR imagery still shows the race largely intact even when running through root rake areas.

The extent of the race was updated on ArchSite using the results of the survey and its path as shown on aerial photographs and LiDAR.

Figure 7-50 Photograph showing tailings on the slope above the Rise and Shine Creek.

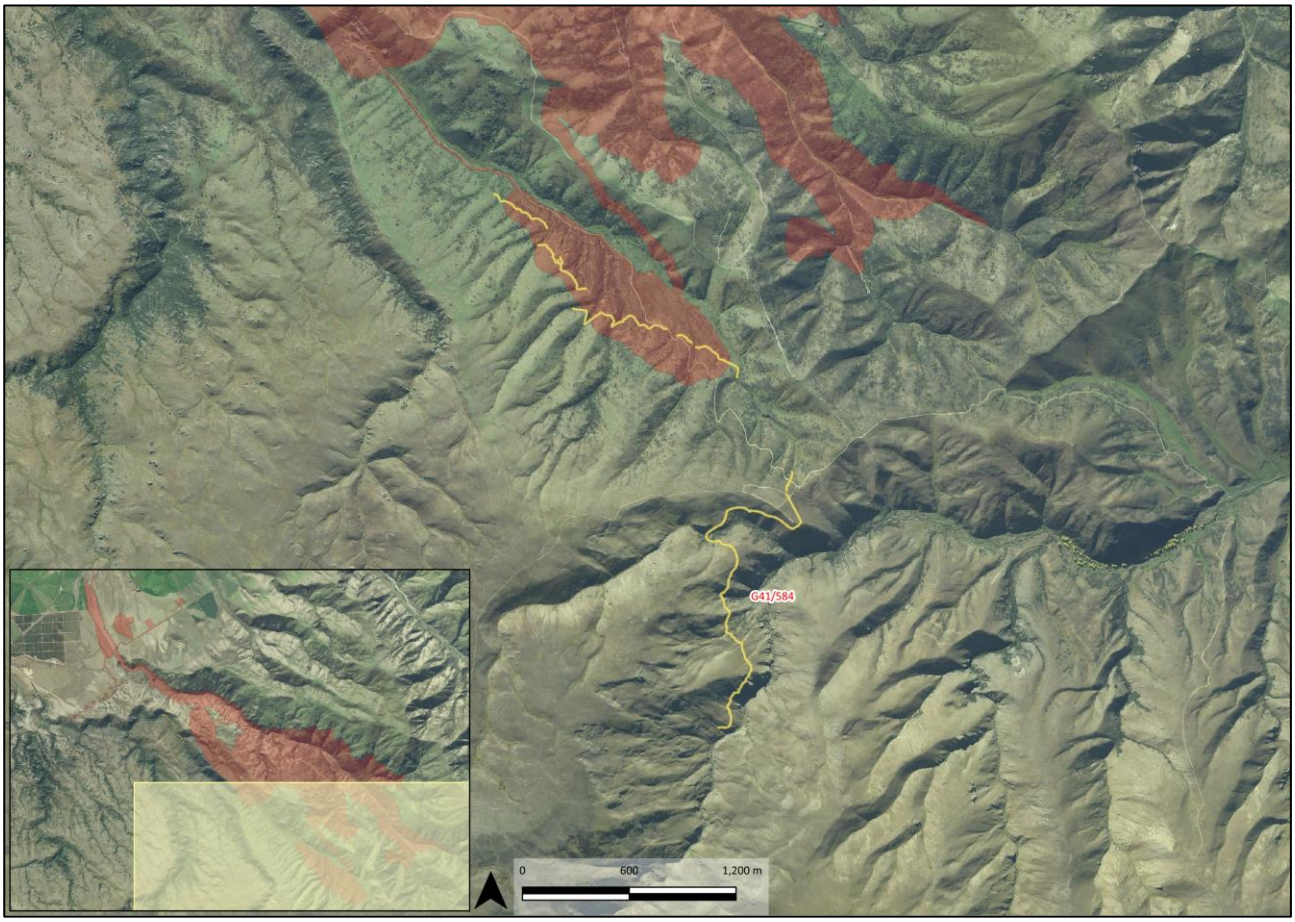

Figure 7-51. Location of G41/584. Project area is shown in red.

Figure 7-52 Photograph looking southeast (left) and northwest (right) at the upper extent of the water race recorded as G41/584.

Figure 7-53. LiDAR image showing the end of the G41/584. At the top of the image the race travels around Mt Moka. The arrow shows the race dropping towards the Rise and Shine Creek.

Figure 7-54. Rise and Shine water race (G41/584) within the project area, looking southeast, February 2018.

Figure 7-55. LiDAR image showing the part of the lower extent of G41/584 running through modern root rake areas (red arrow).

7.10.12 Site G41/586 (Come-in-Time Water Races)

Site G41/586 records the Come-in-Time water race which runs from the Rise and Shine Creek to the Come-in-Time battery (G41/251). The northeast end of the race was identified during the February 2018 survey where it crosses site G41/604 (Figure 7-57). Closer inspection of current LiDAR and 1958 aerial imagery (Figure 7-58) indicates that the water race splits in two, close to where it intersects with present day Thomson Gorge Road. One section turns back in a hair pin turn at Thomson Gorge Road and heads towards Shepherds Creek while the second race heads southwest towards a tributary of Bendigo Creek. The latter aligns with Nichol & Wright's (2006) on site

observations. Modern mining has occurred in and around the water race, in particular late 1980s drill holes along the section leading to Shepherds Creek. While some damage has occurred to this race, the 2018 LiDAR data still shows the race at these locations. The southern extent of the Come-in-Time water race was sighted during the December 2018 survey (Figure 7-59).

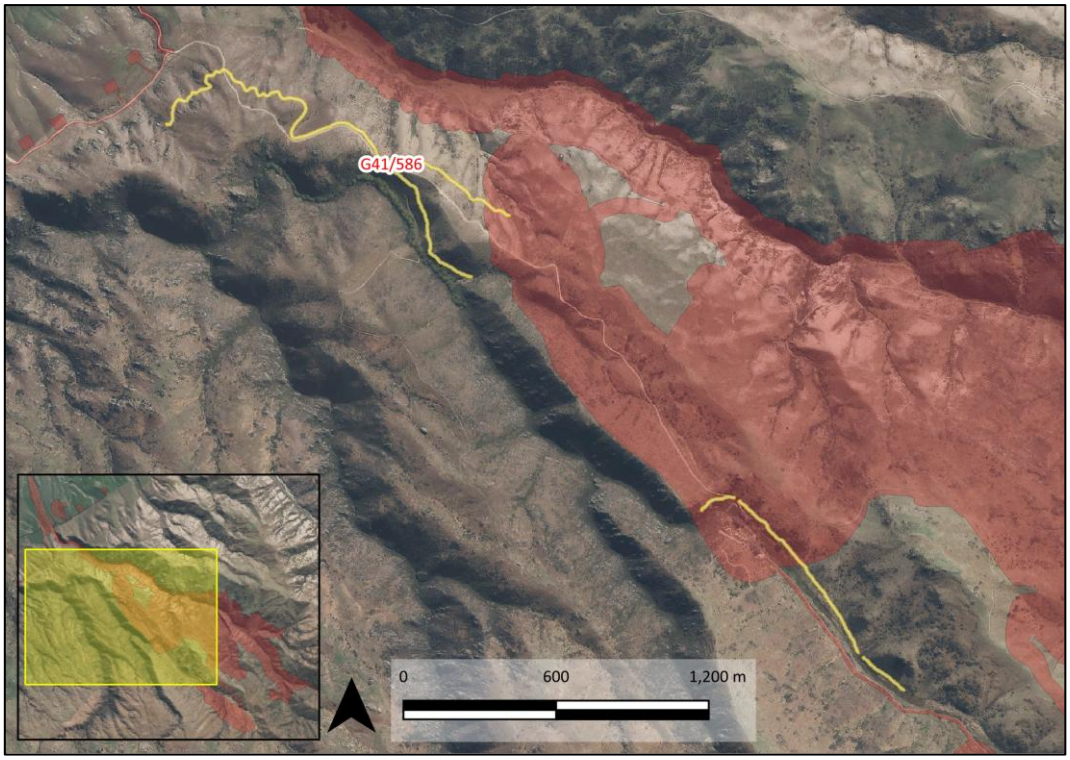

Figure 7-56. Location of G41/586. Project area is shown in red.

Figure 7-57. Photograph looking south at the Come-in-Time water race where it passes through G41/604, February 2018.

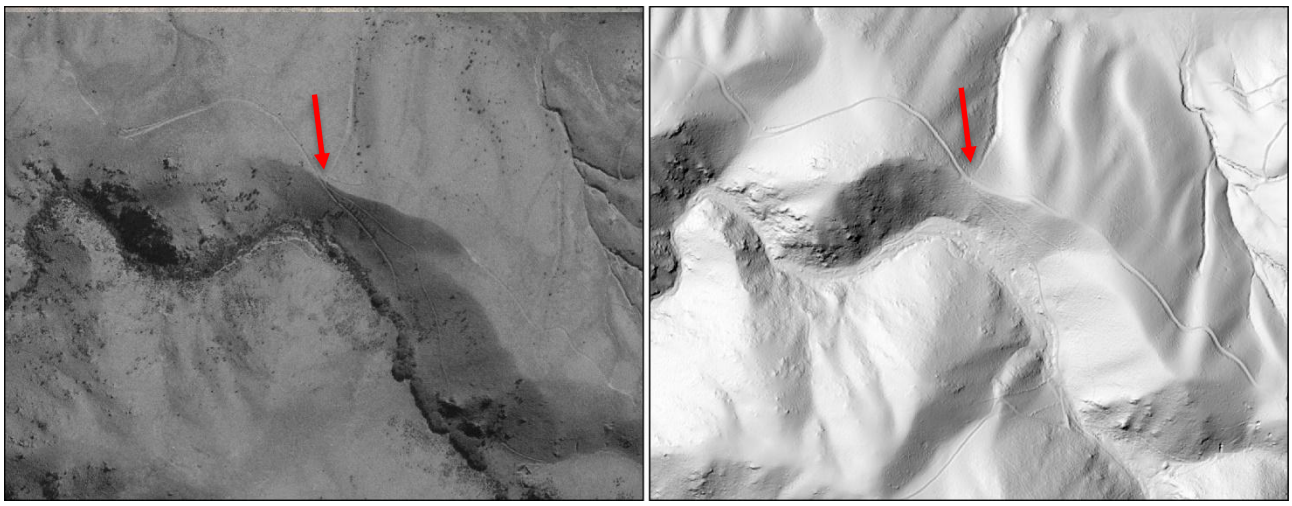

Figure 7-58. 1958 aerial photograph (left) and LiDAR imagery (right) showing the race recorded as G41/586. The split at Thomson Gorge Road is shown with the red arrow.

Figure 7-59 Left: photograph looking north at the Come-in-Time water race. Right: photograph looking northeast at the water race. Both photographs taken December 2018.

7.10.13 Site G41/589 (Revetted Road)

A revetted road (G41/589) ran up behind the Come-in-Time Battery. The road was not revisited during any of the surveys as overgrown vegetation prevented access. However, the road was sighted from the Come-in-Time battery (G41/251) (Figure 7-61) and is visible in 1958 aerial photographs as shown in Figure 7-62. The road is also visible in the 2018 LiDAR data, as is a possible extension to the road heading north that falls within the Come-in-Time pit footprint. This may be a continuation of the road without stone revetments. This extension was not identified by Nichol & Wright (2006) when they recorded the site in 2005. As the extension was not visible in the historic aerial images, nor was it possible to view it during the pedestrian survey due to the vegetation, this has been identified as a point of interest.

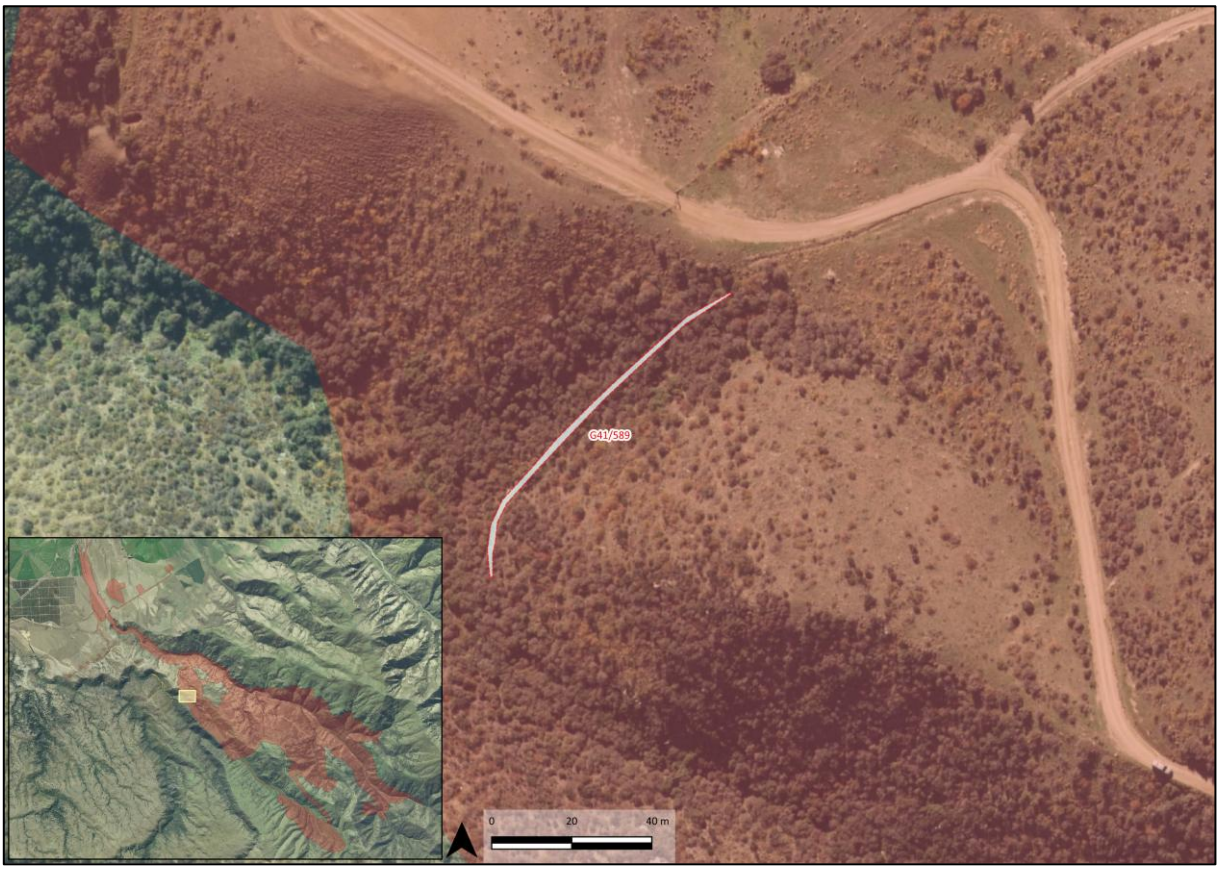

Figure 7-60. Location of G41/589. Project area is shown in red.

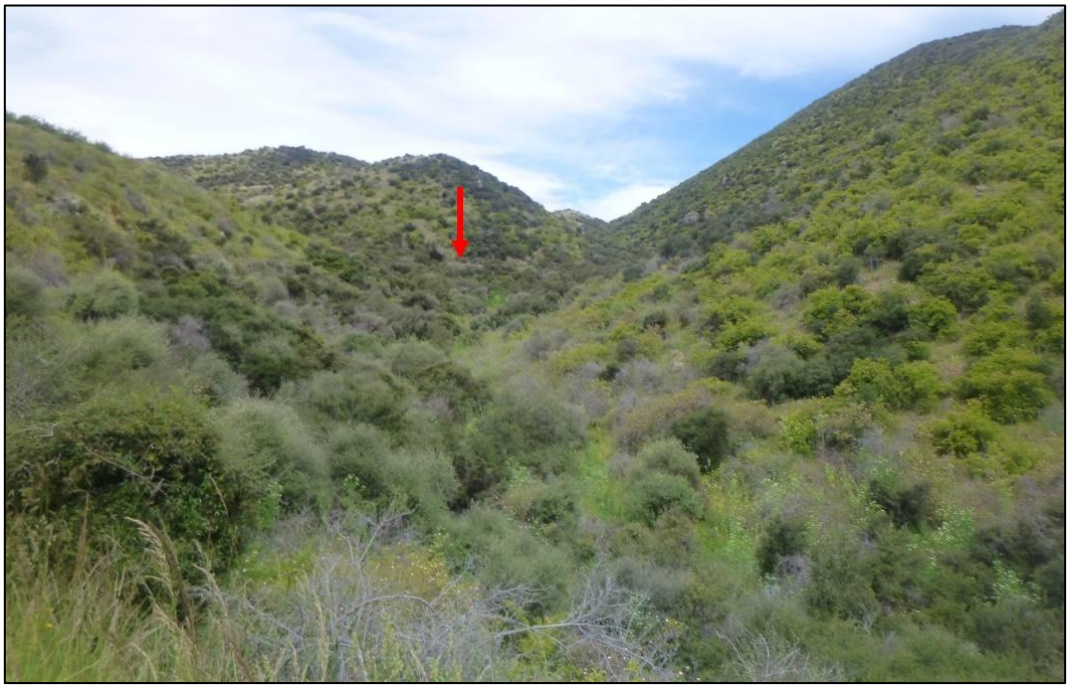

Figure 7-61. Photograph looking northeast at the revetted road recorded as G41/589 (red arrow).

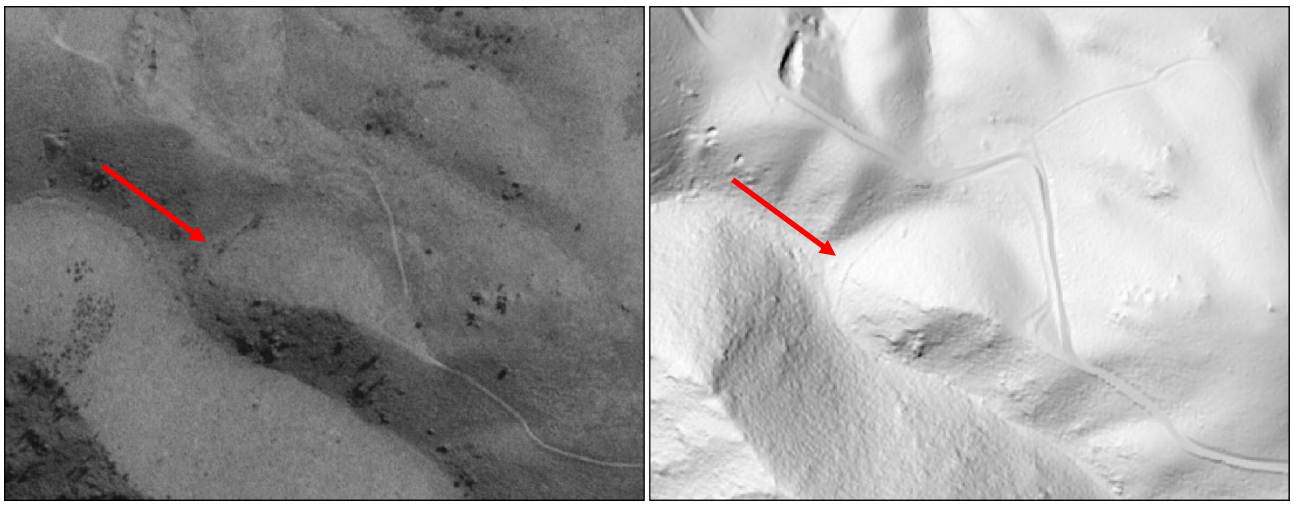

Figure 7-62. 1958 aerial photograph and LiDAR imagery showing the revetted road recorded as G41/589 (red arrow).

7.10.14 Site G41/604 (Battery and Turbine)

The turbine and battery (G41/604, Figure 7-64 and Figure 7-65) was revisited, relocated and reported on during the November 2017, February 2018 and December 2018 surveys. Intact features noted at this time included a stacked stone chimney and forge shown in Figure 7-64. Part of the Come-in-Time water race (G41/586) that passes through site G41/604 had been previously modified during construction of a late-twentieth century access route, activity which potentially modified site G41/604 further, but overall, the site was in fair condition.

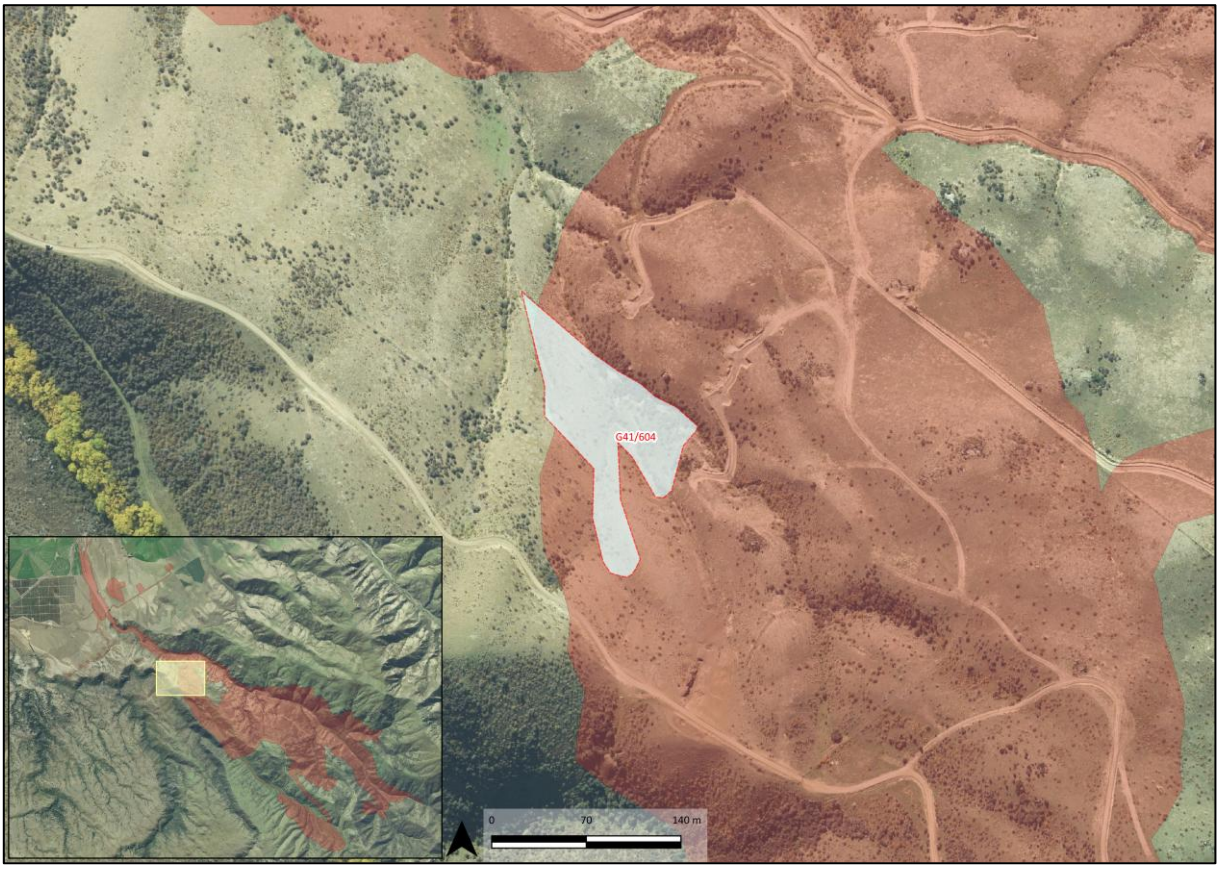

Figure 7-63. Location of G41/604. Project area is shown in red.

Figure 7-64. Stacked stone chimney or forge remains with metal artefacts on top (G41/604), photographed February 2018.

Figure 7-65. Looking southeast towards site G41/604, February 2018.

This site, along with G41/605, was at least partially associated with early twentieth century workings. It is possible that both sites were mined previously, especially G41/604 through which the pre-1900 Come-in-Time water race (G41/586) runs.

7.10.15 Site G41/605 (Mining Workings)

Mine site G41/605 (Figure 7-68) was revisited, relocated and reported on during the November 2017, February 2018 and December 2018 surveys. Both this and site G41/604 are known to have been associated with early twentieth century mining but may contain earlier mining features as this is potentially the location of John Kane's first Come-in-Time works in the 1880s. When the new Alta Syndicate turned to the Come-in-Time in 1914, they

focused attention on an outcrop on the Shepherds Creek side of the claim. Carpenter's (2013b) map shows these workings southeast of G41/604 and G41/605. No such open cut mining remains were identified during the survey at this location; however, closer inspection of photographs taken by Carpenter (2013b) indicates that this is the same area recorded as archaeological site G41/605. It is worth noting the large trenching and "chasms" (Nichol & Wright 2006) previously recorded at G41/605 are clearly visible in the LiDAR data (Figure 7-67).

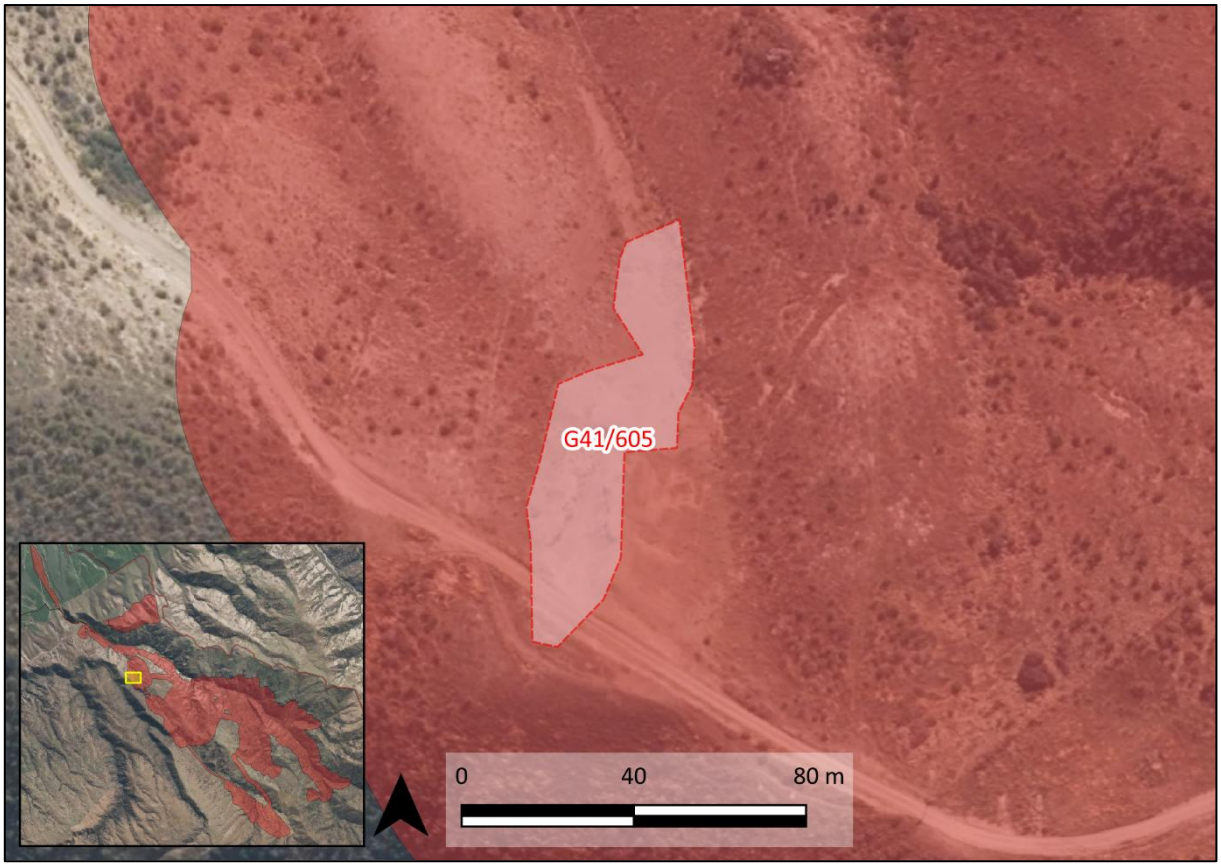

Figure 7-66. Location of G41/605. Project area is shown in red.

Site G41/605 was modified during construction of a late-twentieth century access route, and the top of G41/605 has been modified through use by mountain bikes and motorcycles (Figure 7-68), but overall, the site was in fair condition.

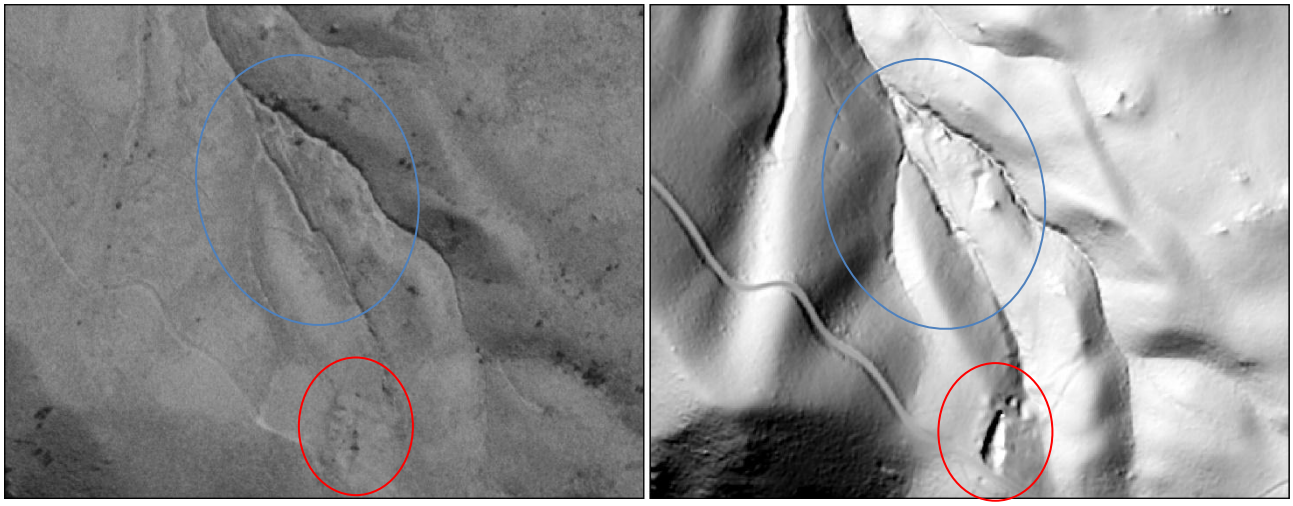

Figure 7-67. 1958 aerial photograph (left) and LiDAR imagery (right) showing G41/604 (blue) and G41/605 (red).

Figure 7-68. Looking southeast at G41/605, towards Thompsons Gorge Road (at top of ridge), showing motorcycle tracks, November 2017.

7.10.16 Site G41/658 (Hut Terrace)

A previously unrecorded hut terrace with potentially associated prospecting pit was identified during the February 2018 survey and was recorded as site G41/658 on ArchSite. An earth bank lined the southwest side of the terrace, thought to have once acted as a wall for a structure as seen elsewhere in the Rise and Shine Valley (e.g., G41/270) which measures approximately 7.5 by 4m and is bordered by introduced rose and oleria bushes (Figure 7-70). Highly fragmented artefacts were noted on the surface, including ceramics, bottle glass and a matchbox, indicative of domestic occupation. A prospecting pit was located approximately 10m downslope from the terrace; however, it is unclear if this is contemporaneous. The terrace, bank and pit were in good condition, and the presence of surface artefacts suggests subsurface remains may be present in the area.

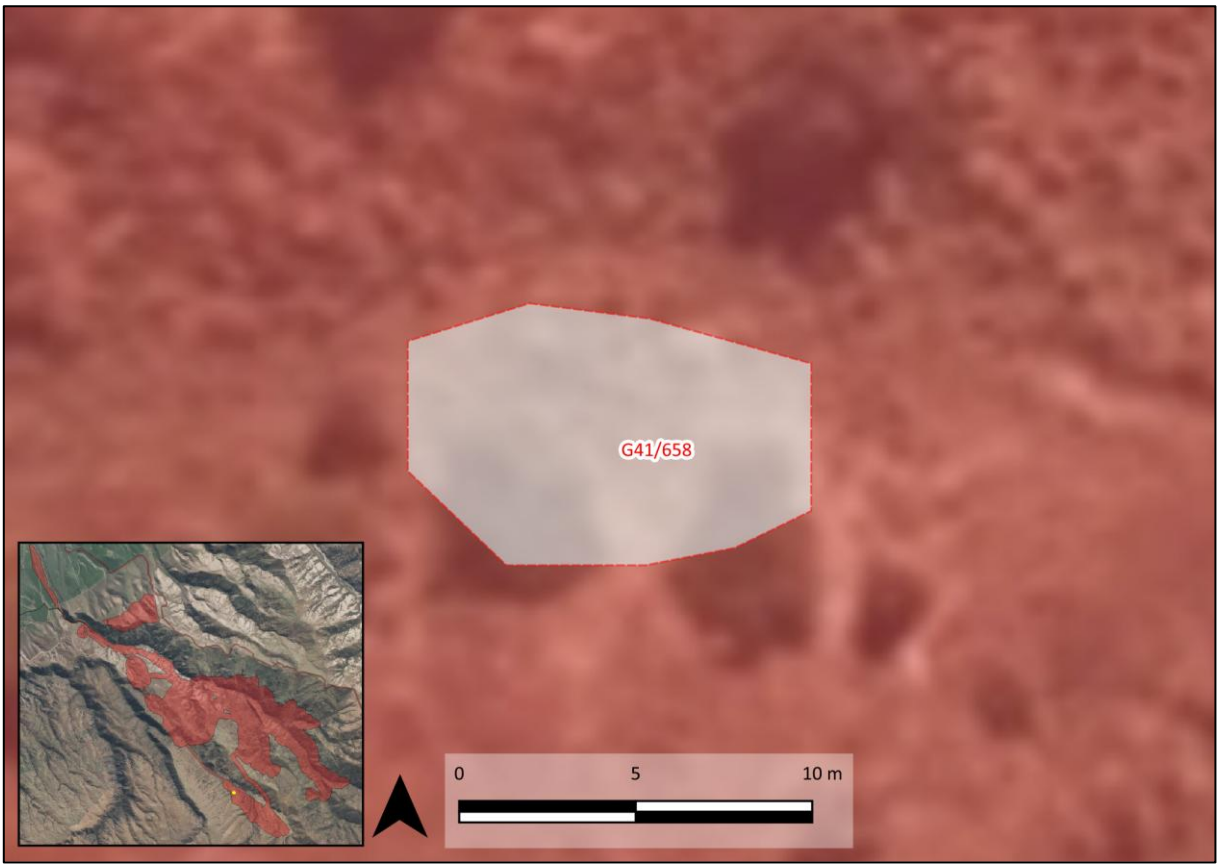

Figure 7-69. Location of G41/658. Project area is shown in red.

Figure 7-70. G41/658 hut terrace, looking north.

7.10.17 Site G41/678 (Stone Chimney)

This hut or tent site with a stacked schist chimney was first recorded during the December 2018 survey located 30 m north of Shepherds Creek and was revisited in August 2022. Only the stacked chimney remains visible on the ground surface (Figure 7-71 to Figure 7-73). The chimney measured 1.2 m by 2 m and stood 1.9 m high. There was no obvious hut or tent platform surrounding the chimney. The site was overgrown in grass and no surface artefacts or associated features were identified surrounding the chimney. It is not clear if the site was used by musterers or miners in the area, but the Shepherds Creek valley has a known history of both activities during the nineteenth century(Woods & Thorrold, 2025).

Figure 7-71. Photograph looking southeast at chimney recorded as G41/678, December 2018.

Figure 7-72. Photograph looking northwest at chimney recorded as G41/678. Megan Lawrence is shown in the background of the chimney.

Figure 7-73. Photograph looking southwest at chimney recorded as G41/678.

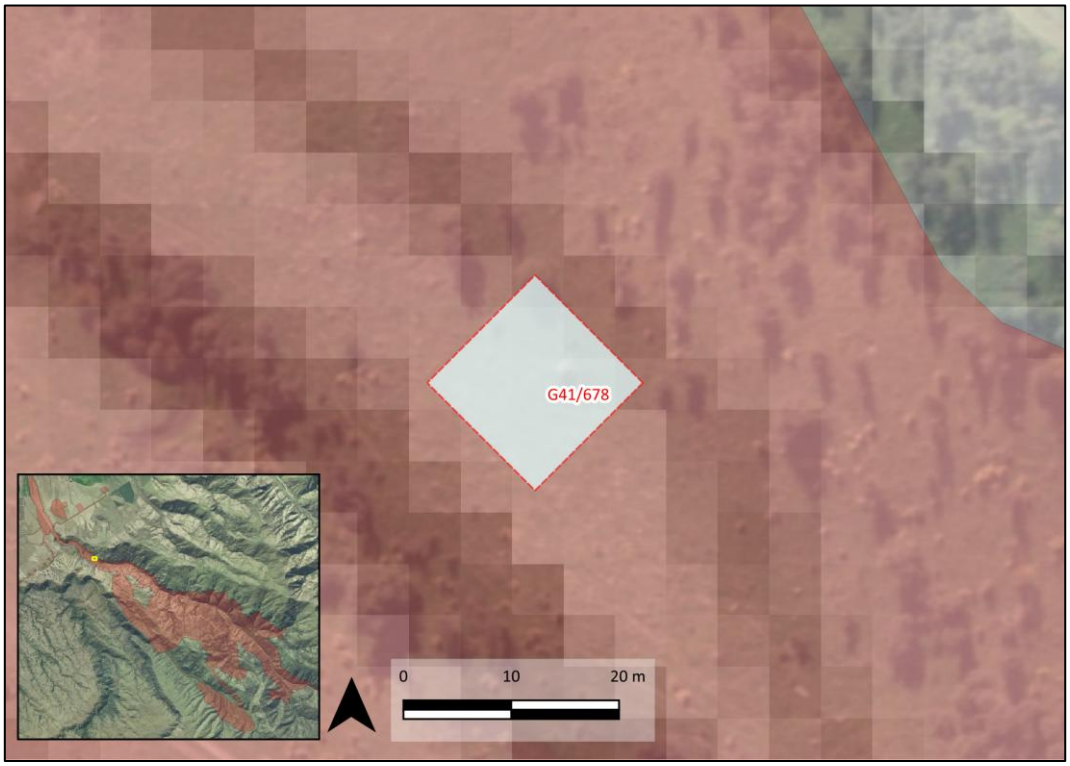

Figure 7-74. Site G41/678 extent with project area shaded red.

7.10.18 Site G41/782 (Matakanui-Bendigo Road)

The Matakanui-Bendigo Road was surveyed in 1898 and its development continued into the early twentieth century. Sections of the road were surveyed by NZHP archaeologists in December 2018 and August 2021, and revisited in December 2025. For the majority of the surveyed route through the project area, the main road is wide enough to allow for vehicular traffic (Figure 7-76). Within the project area nine culverts and four sections of stone

revetment were identified (Table 7-14 and Figure 7-77). All culverts were formed of stacked schist and ranged in condition from poor to good. The position of these culverts in relationship to the present road varied from being immediately on the roadside, to over 2m from the road edge, but all stretch at least the full width of the current road, suggesting it has been this width since its construction.

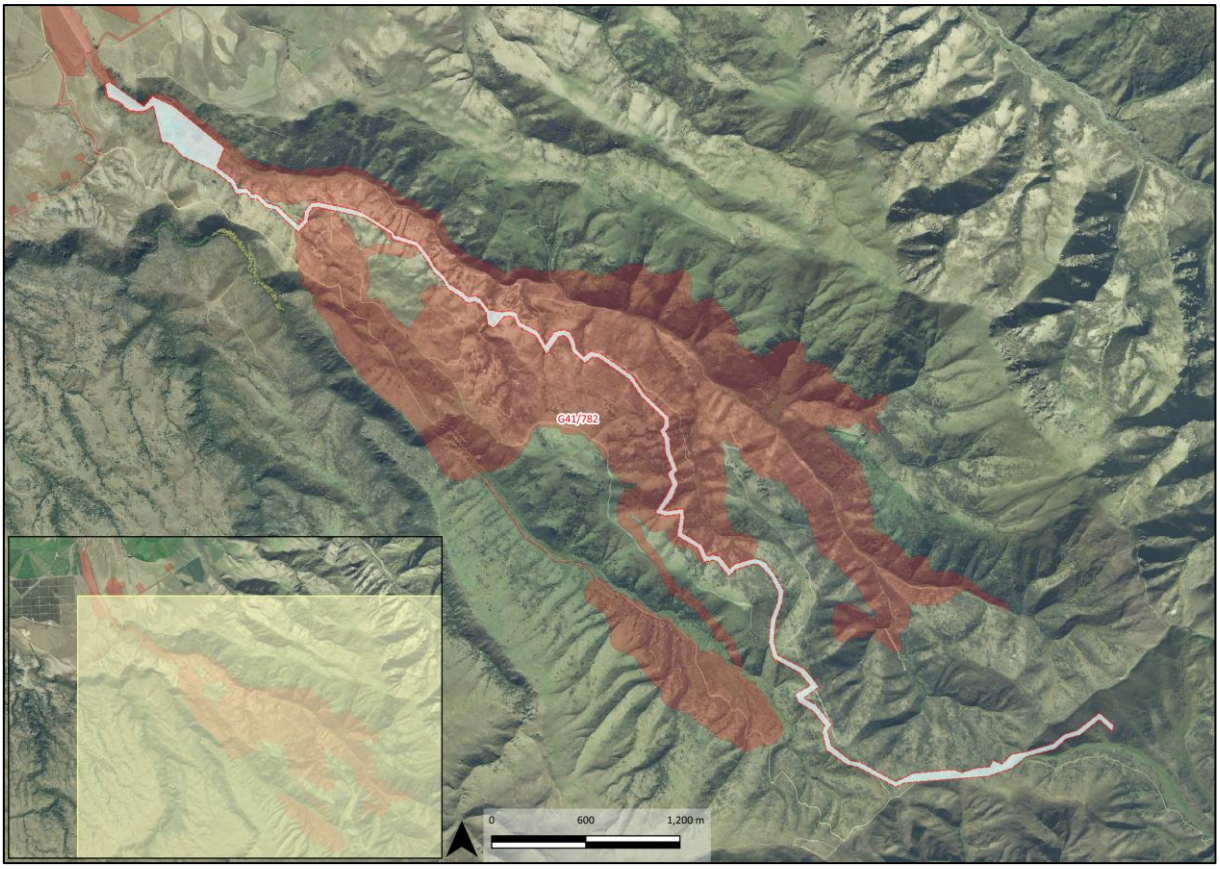

Figure 7-75. Location of G41/782. Project area is shown in red

Figure 7-76. Photograph looking northwest at main vehicle track currently used.

Table 7-14. Features associated with the Matakanui-Bendigo Road (G41/782) identified within the current project area.

POI No.	Feature Type	Survey date	Condition notes
POI 146	Culvert	Dec 2025	Poor - collapsed
POI 241-242	Revetment	Dec 2025	Good condition
POI 799	Culvert	Dec 2025	Good condition, still functional
POI 800	Culvert/revetment	Dec 2025	Fair condition, collapsed on west end
POI 802	Culvert	Dec 2025	Collapsed, poor condition
POI 803	Culvert/revetment	Dec 2025	Good condition, still functional
POI 804	Culvert	August 2021	Good condition
POI 805-806	Culvert	August 2021	Good condition
POI 807-808	Culvert	Dec 2025	Fair condition, partially infilled
POI 809	Culvert	Dec 2025	Good condition
POI 810	Revetment	Dec 2025	Good condition

A stacked schist culvert (POI 146) and a stacked schist revetment (POI 241 and 242) were identified on the hill south of Shepherds Creek in December 2018. The culvert at POI 146 was partially collapsed and stood 0.7m high and was exposed for a width of 0.4m (Figure 7-78). The schist revetment stood up to 1.4m high and ran for 22m (Figure 7-79). Culverts POI 800 and 803 featured larger revetments of stacked schist stone forming an embankment on the downhill, northern side of the road (Figure 7-80 and Figure 7-81). Only the culvert opening of POI 808 was visible (Figure 7-82).

POI 810 marks a large stone revetment (Figure 7-84 and Figure 7-85). This battered wall was 140m long and ranged in height from approximately 0.5 to 3m. The top of the revetment runs 0.5 to 1m back from the road edge. The northeast end the revetment was 1.2 wide. One other feature associated with the track was identified nearby; on the southern (uphill) side of the road a drill scar was visible (Figure 7-86). It is likely that this is the result of construction and maintenance of the road, to clear a wide enough path through natural outcrops, possibly providing stone for the nearby culverts or revetments.

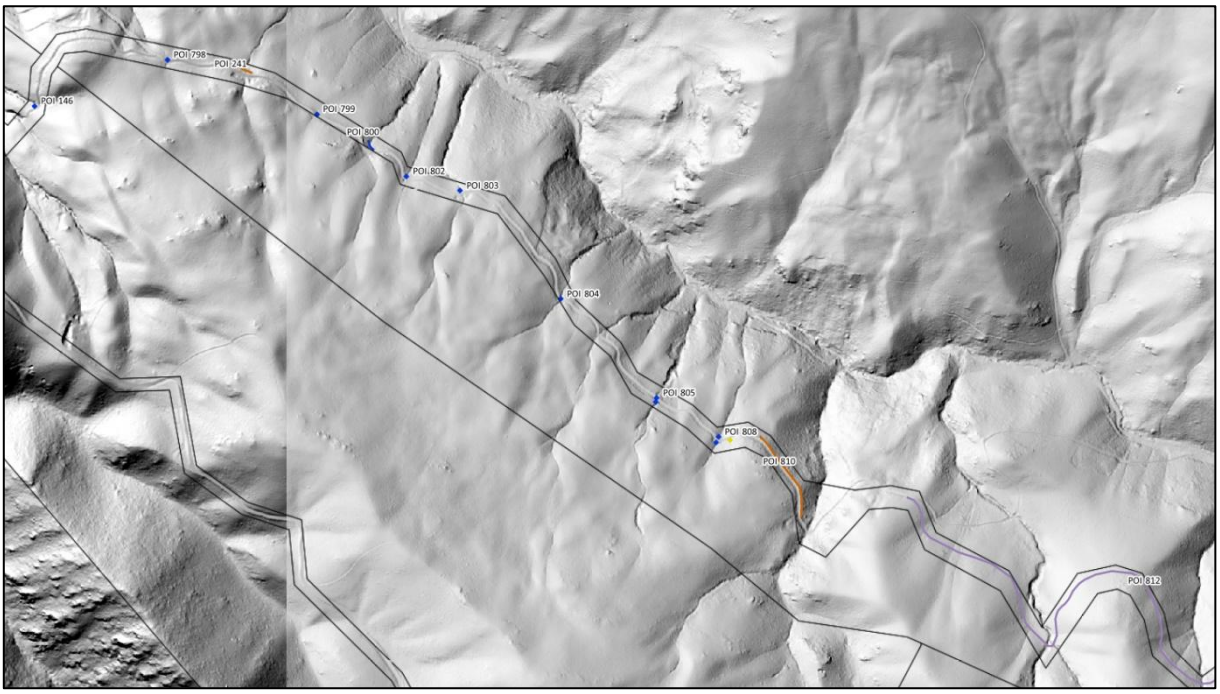

Figure 7-77. LiDAR imagery with land parcel boundaries shown in black. The Matakanui-Bendigo Road as surveyed is shown along with associated features. At the southeast end, the currently used road veers off to the northeast; however, a smaller narrower track continues to follow the surveyed alignment (shown in purple). Features along the track include culverts in blue, historic drill site in yellow, and stone revetments in orange.

Figure 7-78. Photograph looking east at collapsed stacked schist culvert (POI 146), December 2018.

Figure 7-79 Photograph looking south at stacked schist revetment (POI 241-243).

Figure 7-80. Photographs of culvert and revetment (POI 800) looking southeast at intact east end (top left), east at collapsed west end (top right), south at culvert (bottom left), and north at inlet (bottom right). Photographs taken August 2021.

Figure 7-81. Photographs of culvert and revetment (POI 803) looking east (top left), north (top right), south at culvert (bottom left and right). Photographs taken August 2021.

Figure 7-82. Photograph looking south at culvert inlet (POI 808), August 2021.

Figure 7-83. Photographs of stacked schist revetment (POI 810) looking southeast and southwest at the northwest end of the wall.

Figure 7-84. Photographs of stacked schist revetment (POI 810) southeast along the extent of the wall (left) and north (right) at the southeast end of the wall.

Figure 7-85. Photograph looking west at full extent of the stacked schist revetment (POI 810).

Figure 7-86. Photograph looking north at drill point on south (upper) side of the road.

It is likely that many of the stone features present along the Matakanui-Bendigo Road were constructed around the turn of the twentieth century. However, there is potential that some of the stone features may have been constructed or started to be constructed prior to 1900 with investment from the Vincent County Council in 1898 and 1899. The widening and improvement of the road likely replaced an existing, narrower track. By 1907 the

entire Matakanui-Bendigo Road is shown as a track rather than a road in contrast with Thompson Gorge Road to the south (Figure 5-11).

Close to the northern extent of the main project area, the track presently used as the access up the Shepherds Creek Valley veers to the northeast away from the 1898 alignment. However, a narrow track was identified during the survey and is visible in the LiDAR which follows the 1898 proposed road alignment. This formation, approximately 1.5m wide and too variable and steep in gradient to form a water race, may be associated with a pre-1900 track. However, this track has been identified by Bruce Jolly (pers. comms.) of Ardgour Station, to be one he installed 15-20 years ago. If an earlier track was present, it would have been heavily modified at this time.

Figure 7-8788. Photograph looking southeast at the narrow track following the 1898 proposed road alignment.

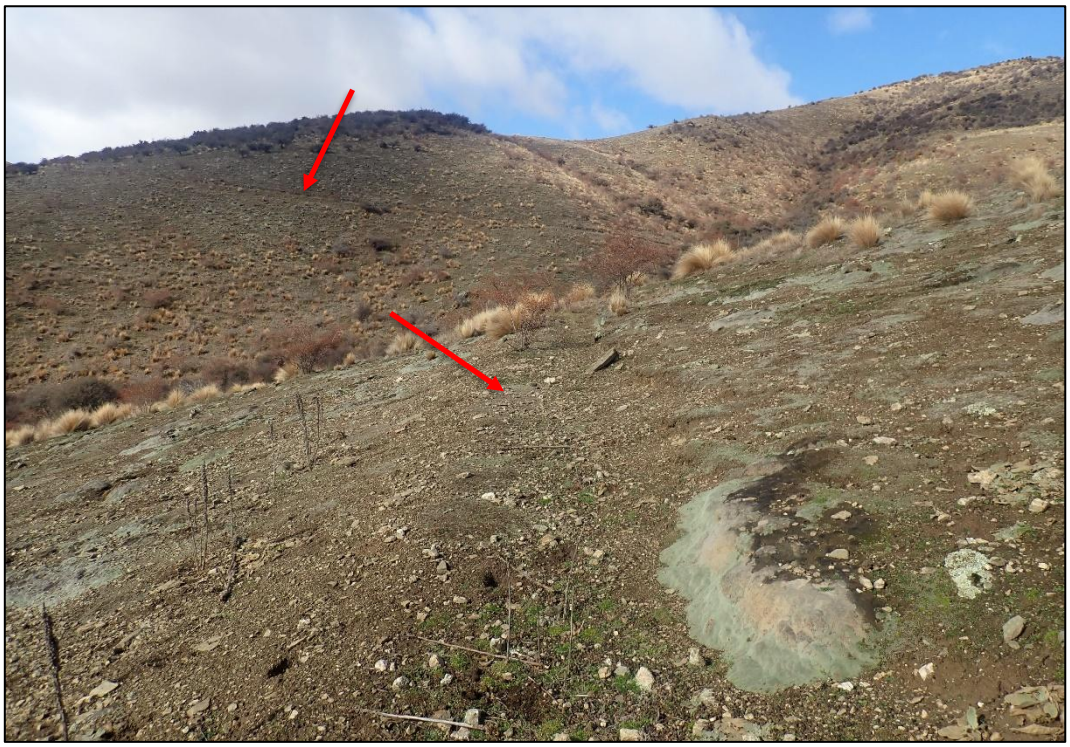

Figure 7-89. Photograph looking southeast at the narrow track following the 1898 proposed road alignment continuing over the next spur beyond the proposed works area.

7.10.19 Site G41/783 (Track)

A possible pre-1900 track was identified northwest of the Rise and Shine Mine and Battery (G41/277) in December 2018. The track was approximately 3m wide and runs northeast-southwest adjacent to Thomson Gorge Road (Figure 7-91 and Figure 7-92). The track is possibly an earlier alignment of Thomson Gorge Road through this valley used by miners and farmers in the area.

Figure 7-90. Location of G41/783. Project area is shown in red.

Figure 7-91. Photograph looking west at possible pre-1900 track (red arrows).

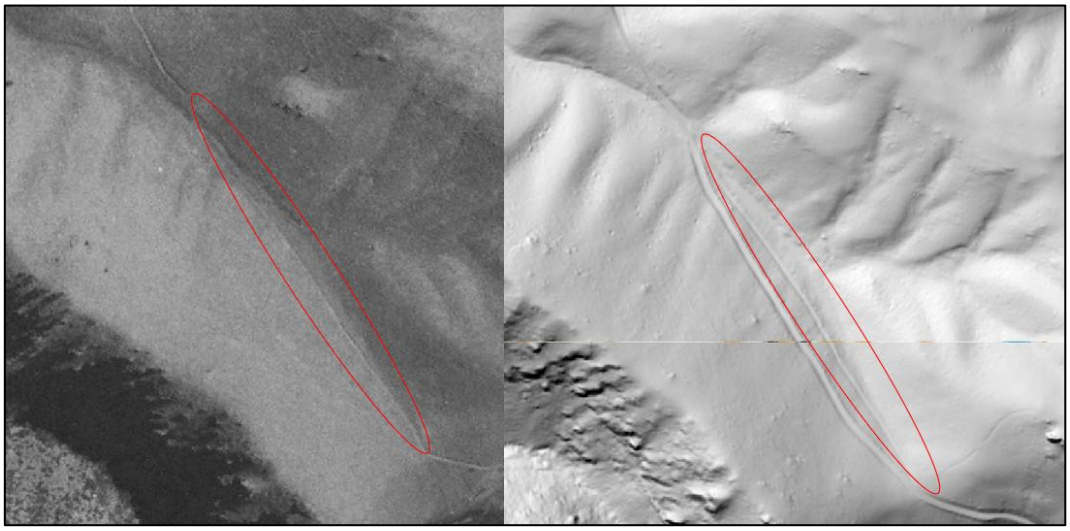

Figure 7-92. 1958 aerial photograph (left) and LiDAR imagery (right) showing possible track in the valley north of Clearwater Creek valley.

7.10.20 Site G41/784 (Hut Sites)

Two possible hut or tent sites were recorded in December 2018, approximately 25m southeast of hut or tent site G41/678 in the Shepherds Creek valley. These were two raised grassed areas which included a number of schist stones that may have once belonged to a structure (Figure 7-94 and Figure 7-95). The thick grass at the time made it difficult to identify distinct extents of the areas; however, the raised platform area closest to G41/678 was approximately 8 m by 3 m, and the next raised area approximately 5 m from the first was approximately 5 by 6 m. Due to their proximity, these two platforms have been recorded as one site, and are thought to relate to the small scale mining that took place in this valley during the nineteenth century.

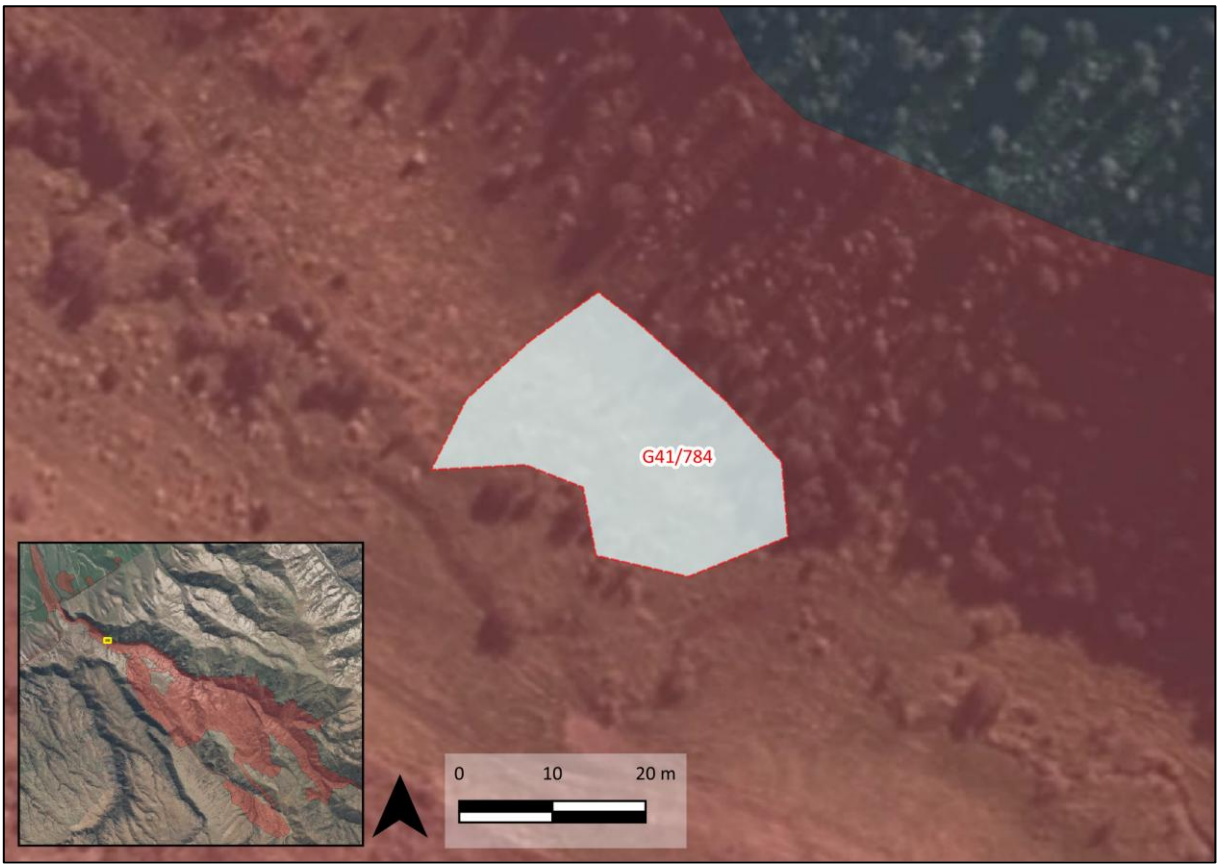

Figure 7-93. Location of site G41/784. Project area is shown in red.

Figure 7-94 Photograph looking southeast at raised platform and schist areas. Phoebe Scrivener stands on the south-eastern most raised platform.

Figure 7-95 Photograph looking south at raised platform and schist area.

7.10.21 Site G41/785 (Hut Site)

A mound further up the Shepherds Creek valley (Figure 7-97) is also possibly associated with historic mining, in particular the diversion of the creek, and potential campsite remains were identified in the vicinity during the August 2021 survey. This subsequent November 2021 survey also showed that recent drilling access tracks had been installed close to POI 815 but had not impacted the feature or exposed any archaeology.

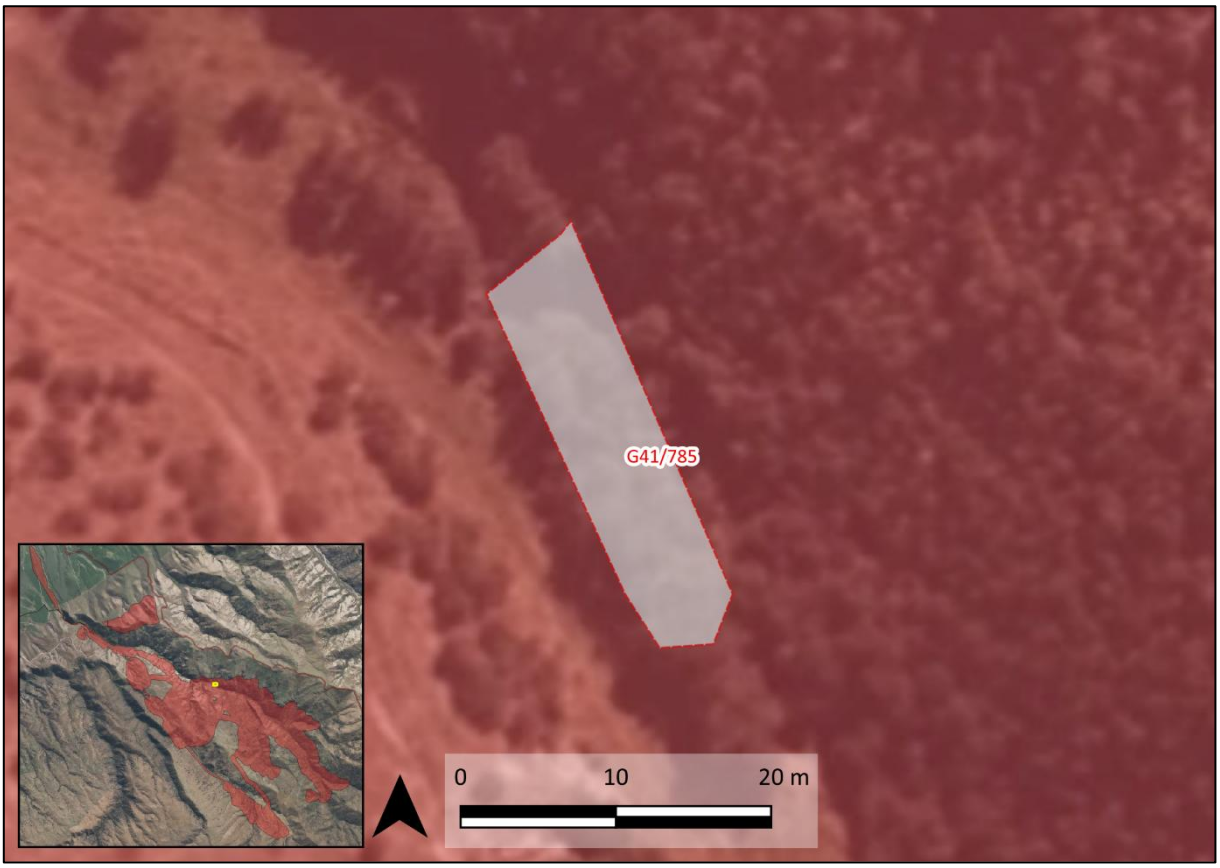

Figure 7-96. Location of G41/785. Project area is shown in red.

Figure 7-97. Photographs showing mound alongside Shepherds Creek (POI 815), November 2021.

7.10.22 Site G41/786 (Hut Site)

A potential campsite with remnant of fire (Figure 7-99) was recorded in August 2022 close to the junction of Shepherds and Jean Creek. Vegetation and terrain made this site difficult to record in any detail and as such the extent should be treated with some caution; however, a small, terraced area is visible in LiDAR imagery of this location (Figure 7-100). This is close to the southeastern-most "old workings" shown in the 1907 geological plan (Figure 5-11) and may therefore relate to the small-scale mining that took place in this valley during the nineteenth century.

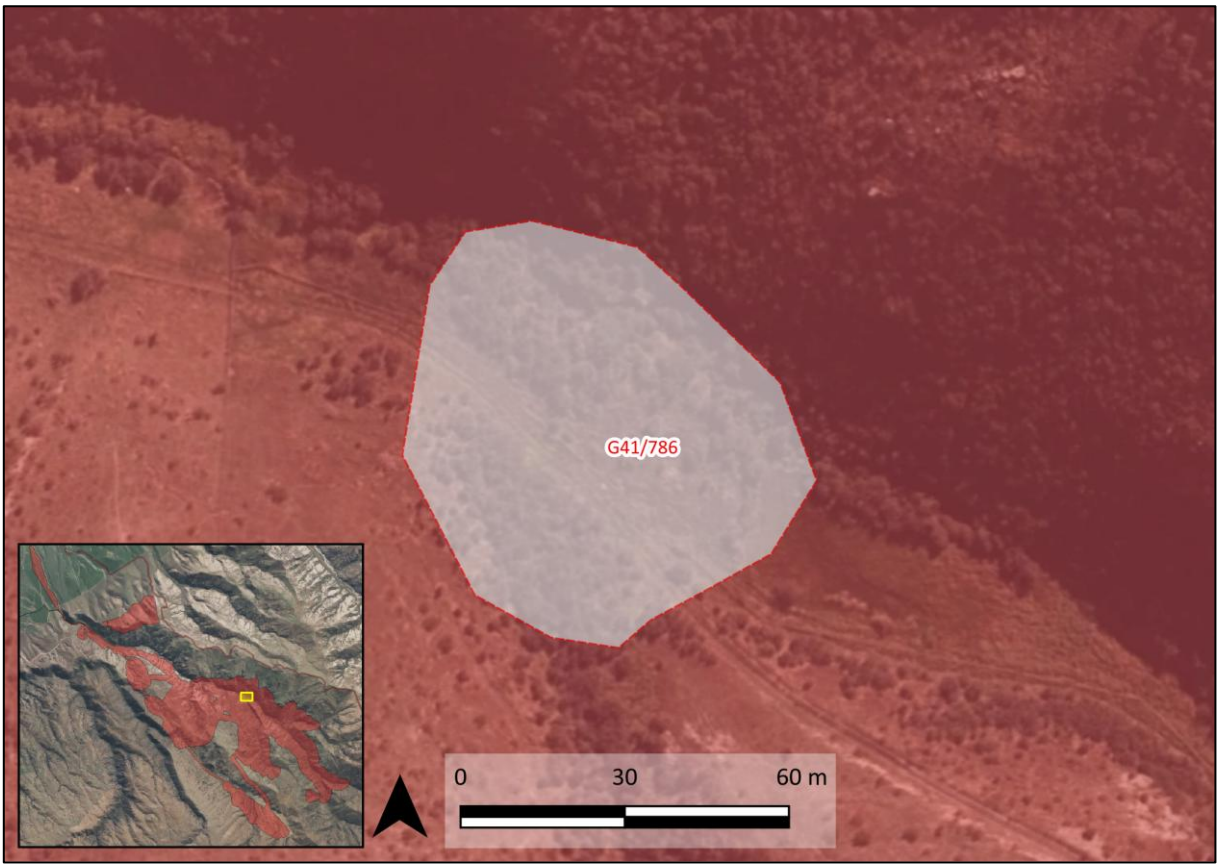

Figure 7-98. Location of G41/786. Project area is shown in red.

Figure 7-99. G41.786 looking south, August 2022.

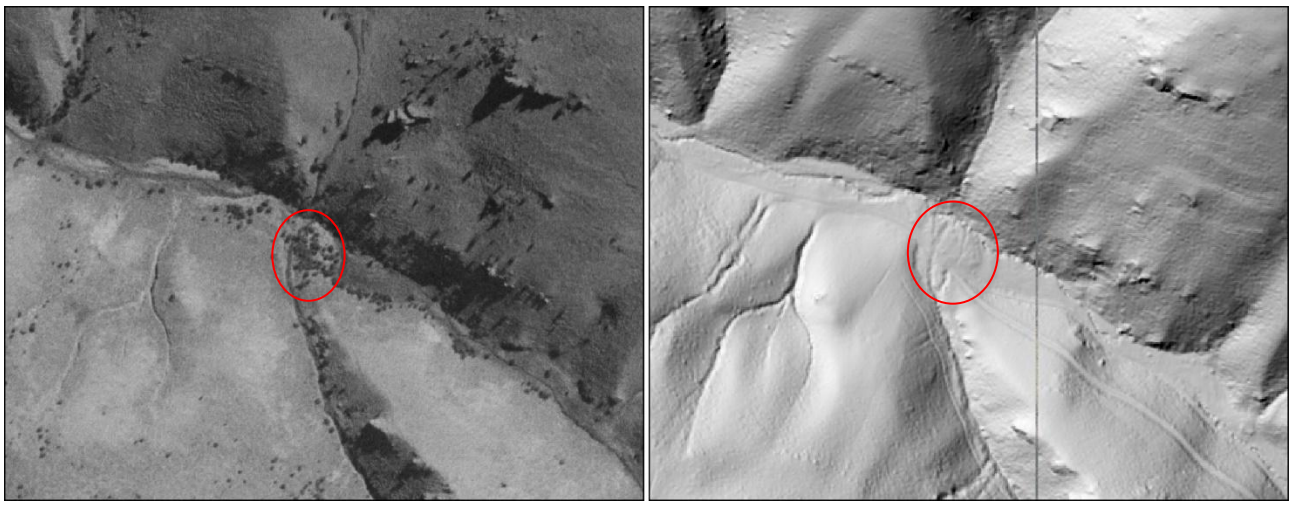

Figure 7-100. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of G41/786 circled red.

7.10.23 Site G41/787 (Tailings)

A small area of possible tailings or mullock was identified 13m south of Shepherds Creek, within the area shown are worked during the nineteenth century in Figure 5-11, during the December 2018 survey. Again, overgrown vegetation made it difficult to discern the possible tailings, however, the area visible spanned 4 by 6m (Figure 7-102).

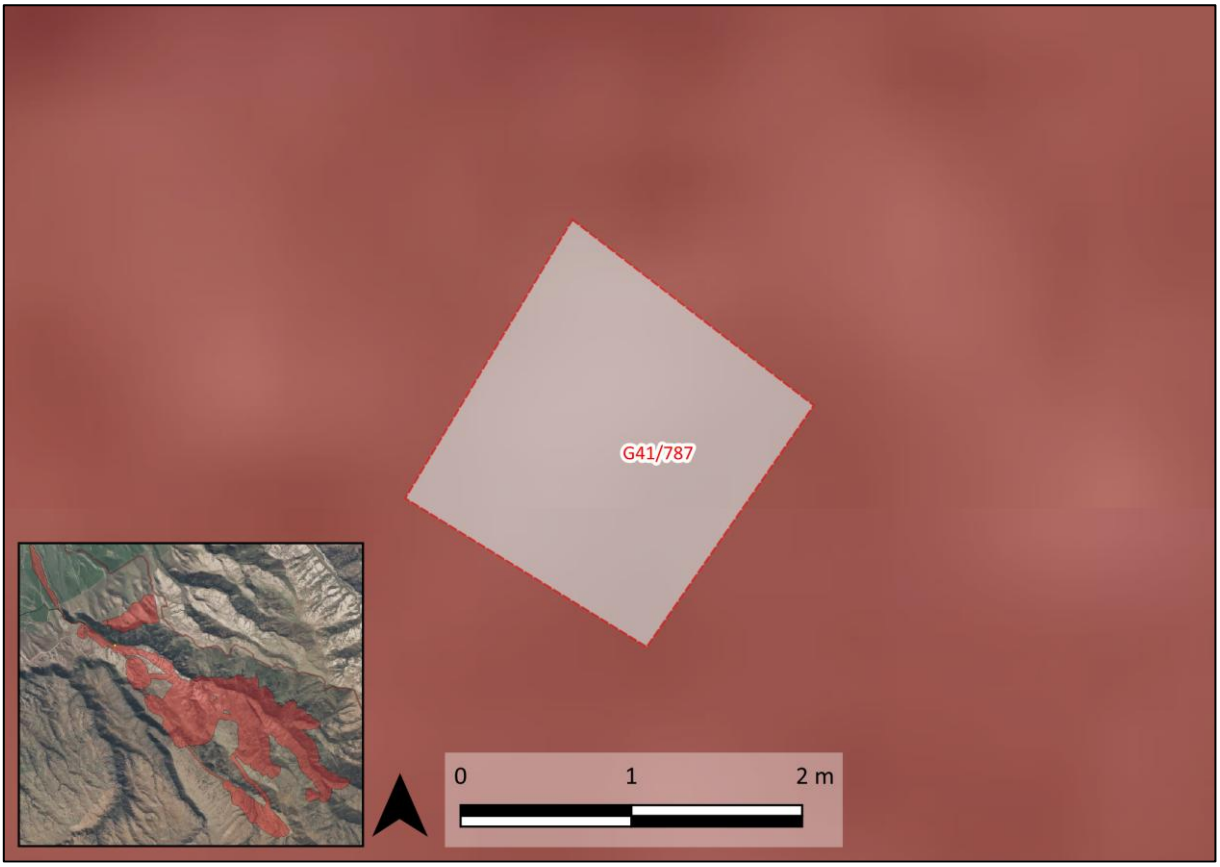

Figure 7-101. Location of G41/787. Project area is shown in red.

Figure 7-102 Photograph looking west at possible tailings.

7.10.24 Site G41/788 (Tailings)

An area of potential prospecting tailings was recorded at the base of Jean Creek in August 2022. These tailings are just discernible in historic aerials and LiDAR (Figure 7-105), but vegetation and terrain made it difficult to confirm the full extent on the ground. This is close to the southeastern-most "old workings" shown in the 1907 geological plan (Figure 5-11) and may therefore relate to the small-scale mining that took place in this valley during the nineteenth century.

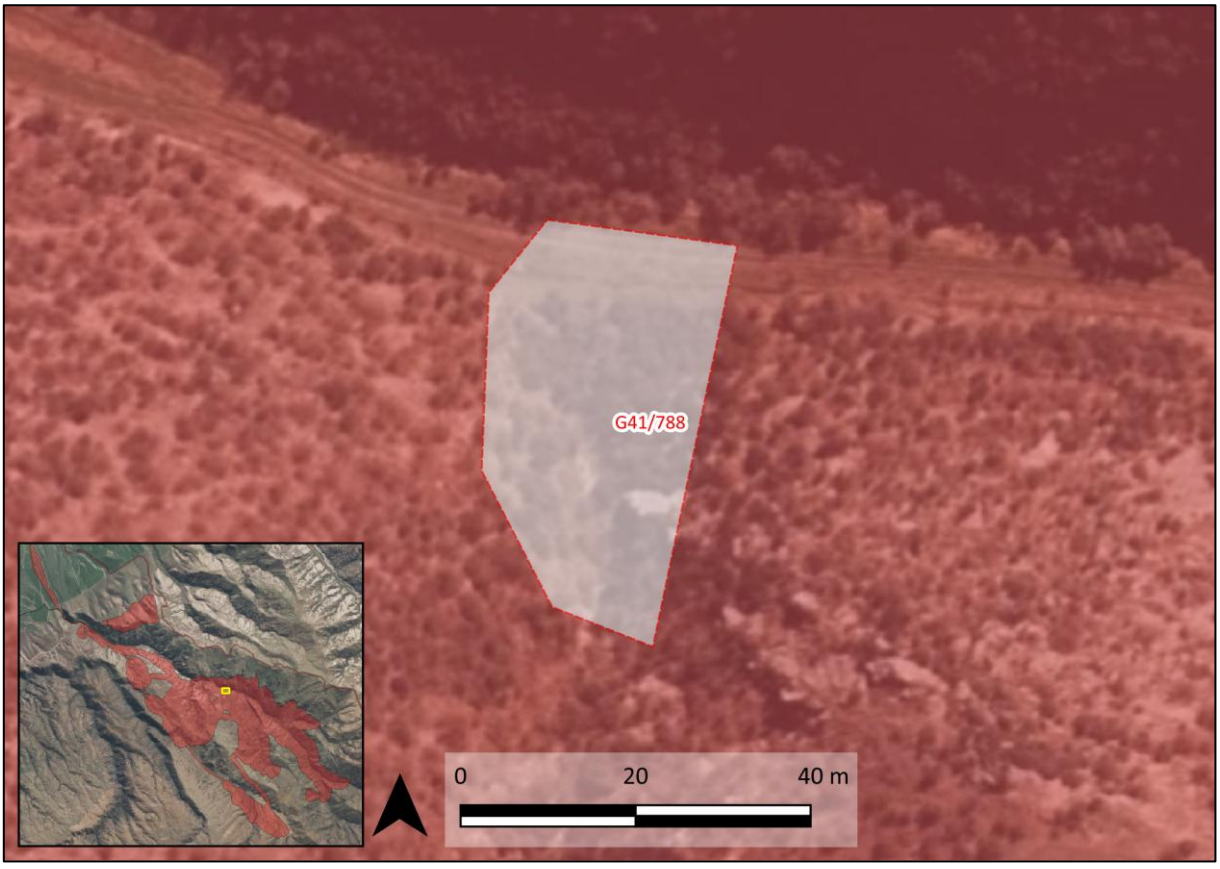

Figure 7-103. Location of G41/788. Project area is shown in red.

Figure 7-104. Looking southwest at site G41/788, August 2022.

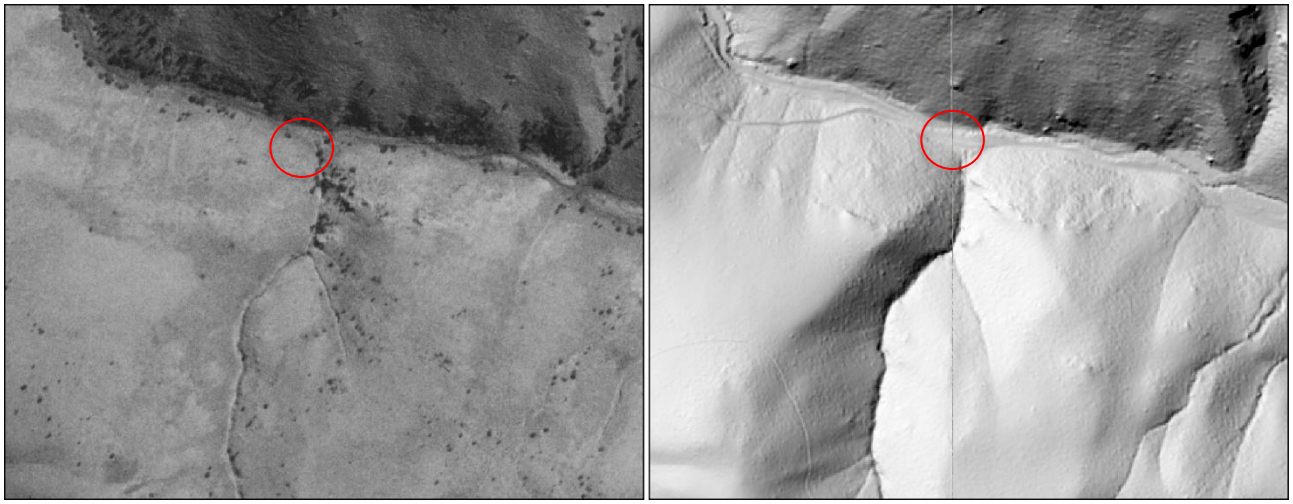

Figure 7-105. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of the POI 844 circled red.

7.10.25 Site G41/789 (Sluicing)

An area of potential sluicing (Figure 7-107) was recorded along Jean Creek in August 2022. This site consisted of a sluiced channel on the hillside with displaced schist slabs. Dense matagouri and briar restricted the ability to define the site boundary on the ground, but potential sluice faces covering a wider area are visible in historic aerials and LiDAR (Figure 7-108).

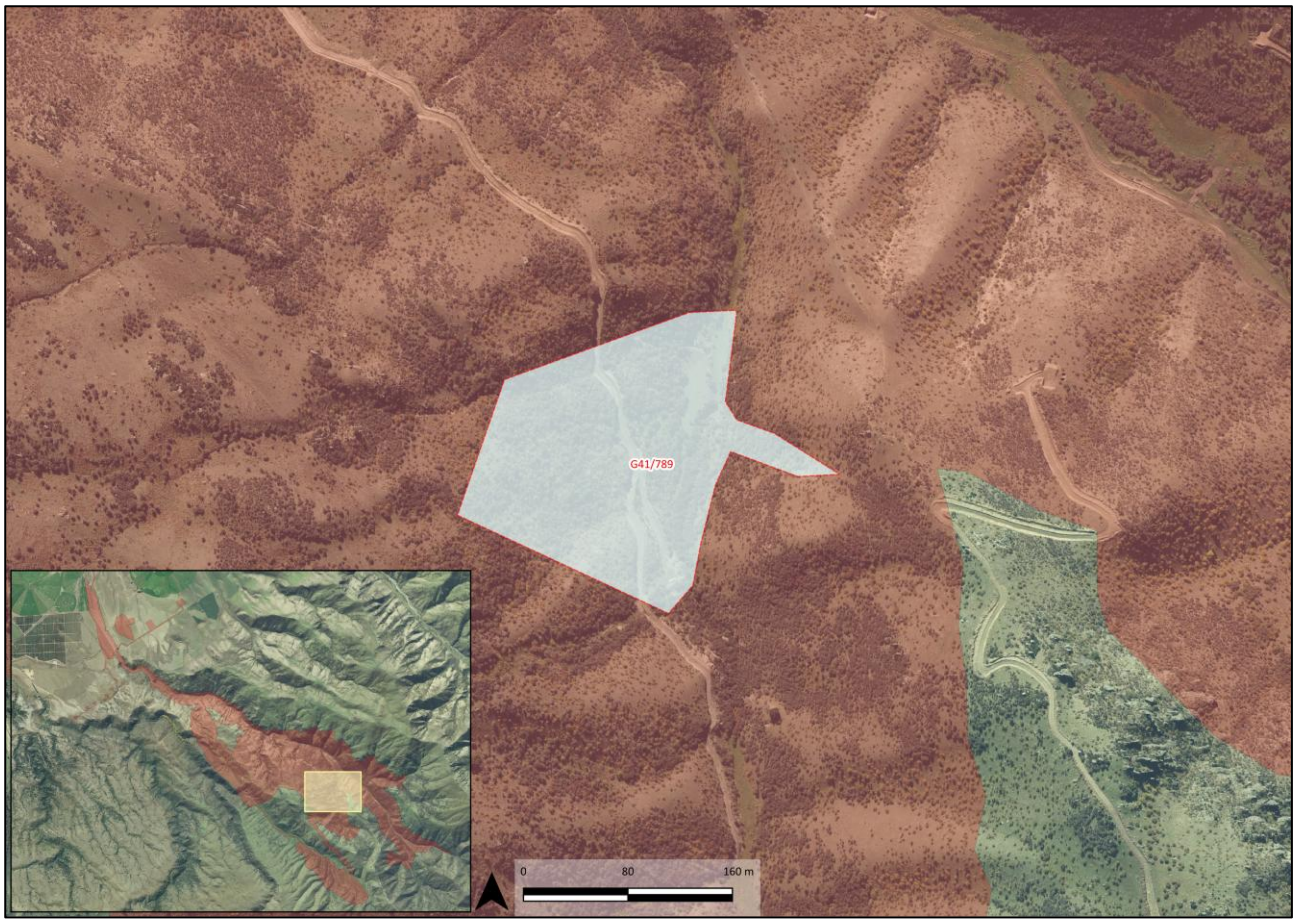

Figure 7-106. Location of G41/789. Project area is shown in red.

Figure 7-107. G41/789 looking east, August 2022.

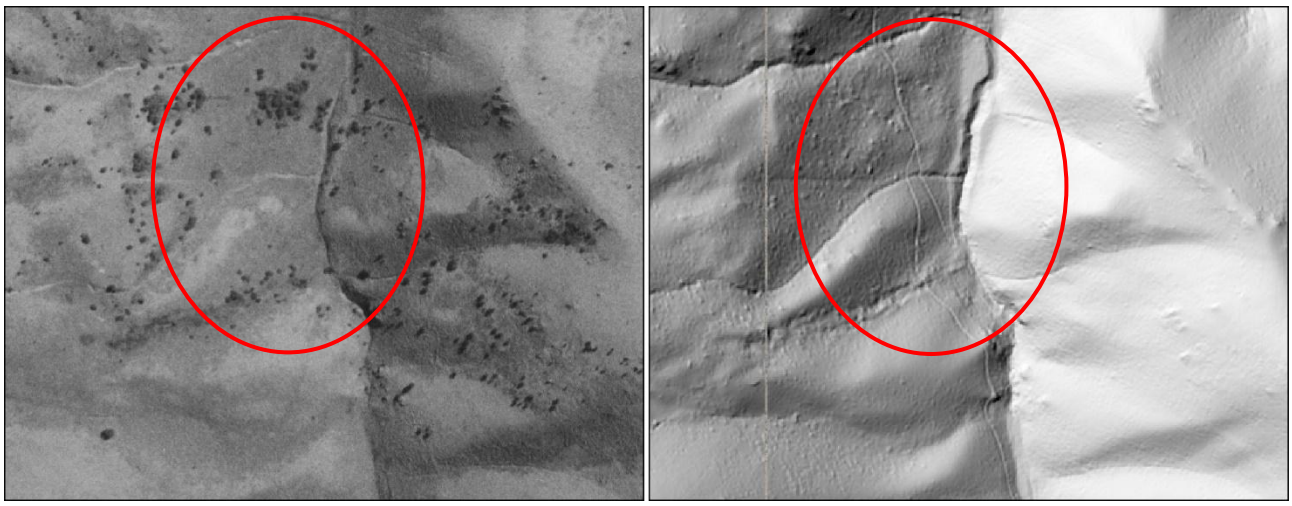

Figure 7-108. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of G41/789 circled red. All other linear features were determined to be natural or stack tracks during the pedestrian survey.

7.10.26 Sites G41/790 and G41/792 (Water Races)

Two previously unrecorded water races were identified during the December 2024 survey and a site visit in September 2025. Water race G41/790 is located in the flat paddock area to the north of Shepherds Creek valley. The full length of the water race is approximately 1200m, although a modern road seems to have cut the race in the project area. Disturbances to the race as a result of this road include the edge of the race being cut down, and the race being filled in. The race measures 1.4m wide and 800mm deep, with notable raised mounds on the side of the race.

Figure 7-109. Location of G41/790. Project area is shown in red.

Figure 7-110. Photographs of the water race, left photograph facing west, and right photograph facing east towards the project area.

Water race G41/792 is located on the slope on the east bank of Shepherds Creek. The full length of the water race, visible in LiDAR and aerial imagery, is approximately 1600m, although a modern farm track and fence line have cut the race in the project area. Disturbances to the race as a result of this include the edge of the race being cut down, and the race being filled in. The race measures 1.5m wide, with notable raised mounds on the side of the race.

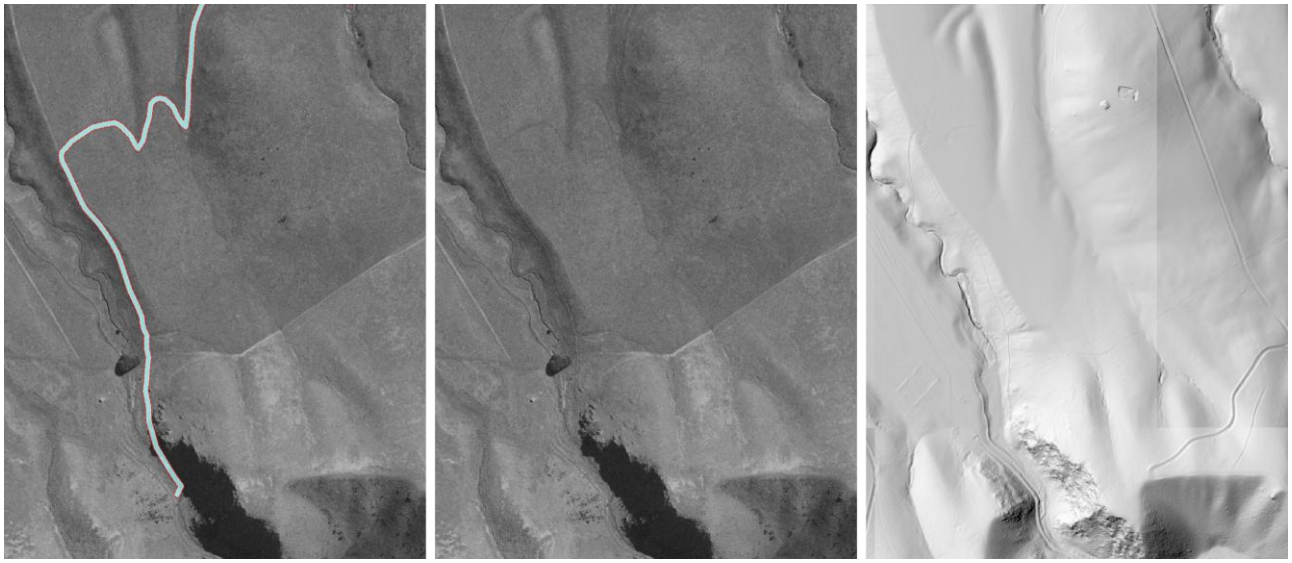

Figure 7-111. 1958 aerial (left and centre) and LiDAR imagery of project area with water race shown in left image.

Figure 7-112. Photograph of the water race looking south, September 2025.

Figure 7-113. Looking north along water race, September 2025.

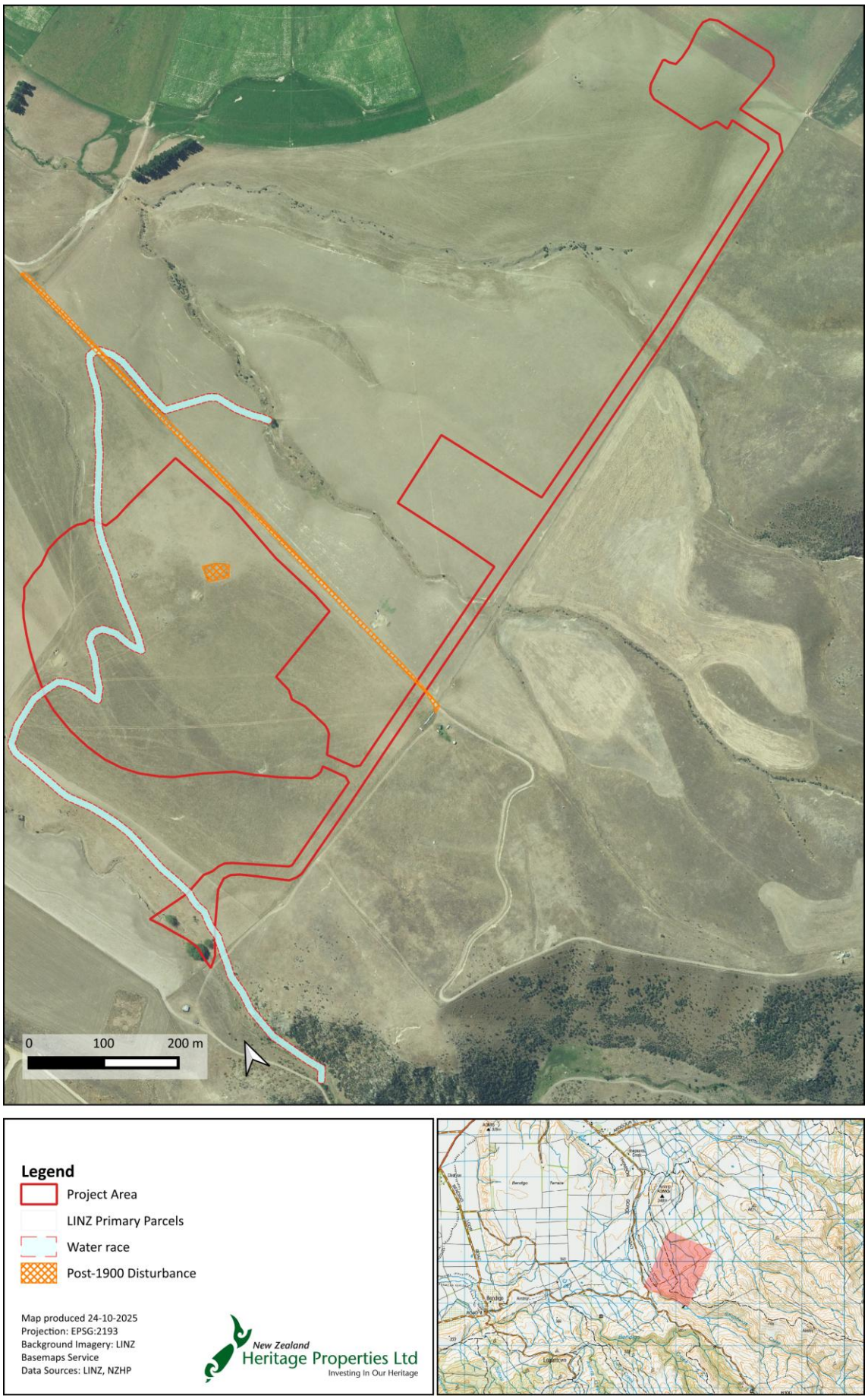

Figure 7-114. Map showing extent of recorded water race G41/792 with relevant portion of project area outlined in red and areas of known modern disturbance shown.

7.10.27 POI 3, 5, 46 and 47 (Potential Water Races)

Four potential water races were identified in historic aerials and LiDAR running southeast-northwest though the project area. These features were unable to be located during the pedestrian surveys (Figure 7-116 and Figure 7-117). It is possible that these features are stock tracks that are shallow enough to be totally obscured by the spring vegetation growth, alternatively these could be water races that have been so heavily eroded that there are no longer decipherable mounds on either side. This area has long been subject to heavy stock traffic and ploughing, making both possibilities feasible. Removal of turf and topsoil in the location of these features would quickly show the presence or absence of historic water races.

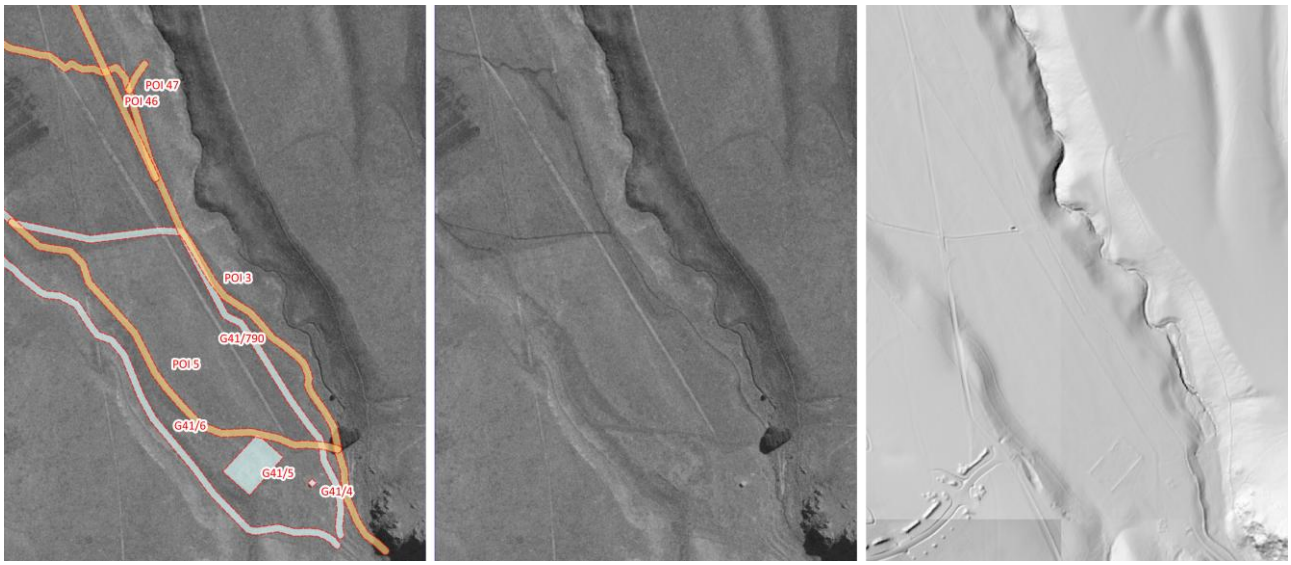

Figure 7-115. 1958 aerial (left and centre) and 2018 LiDAR imagery with POI 3, 5, 46 and 47 labelled.

Figure 7-116. Looking south from northern tip of project area towards location of POI 46.

Figure 7-117. Facing northwest at location of potential fork of POI 47.

8 Research Results

The documentary research into the project area revealed a landscape that has been used by manawhenua as an ara tawhito from the east coast into the central lakes for a long time before being transformed initially by early pastoralists in the 1850s and then again by goldminers from the 1860s. While the use of Thomsons Saddle and the Rise and Shine Valley as an ara tawhito likely had little physical impact on the project area, it did create a rich cultural landscape full of named landmarks. No previously recorded archaeological sites relating to manawhenua activity are present within the project area, and none were identified during any of the surveys undertaken by NZHP; however, this does not detract from the area's cultural significance and manawhenua should be consulted directly for this information.

The project area was first incorporated into a pastoral run in 1858 (Morven Hills Station) and further subdivided into the Bendigo and Ardgour Stations in the early twentieth century. This occupation saw the removal of swathes of native vegetation and transformation of the landscape into the low scrub and pasture that covers the project area to the present. One previously recorded heritage site relating to the pastoral occupation of the project area was identified during the course of this assessment: G41/4, known today as Rabbiter's Hut.

Goldmining began in the project area with the Rise and Shine syndicate in the 1860s whose water race (G41/584) mid-scale alluvial workings (G41/264) paved the way for exploitation of the bountiful local gold resources first within the Rise and Shine Valley and subsequently spreading down and into the neighbouring creek valleys and alluvial flats. As the nineteenth century progressed, the focus of miners in the area shifted to quartz mining, and this continued well into the twentieth century with many syndicates revisiting older claims to make use of new technologies.

The resulting landscape is a palimpsest of landscape transformations at multiple scales that has attracted numerous phases of heritage and archaeological investigations, and as a result the heritage resources of the area are for the most part well understood. There are 18 previously recorded archaeological sites within the project area (Table 7-12), with an additional ten new heritage sites identified during the multiple surveys undertaken by NZHP between 2017 and 2024 (Table 7-13). These sites include goldmining working complexes, water management features, domestic sites and transportation sites.

Due to the complex and multi-layered nature of the landscape, many of the sites within the project area are difficult to attribute to a specific time period or phase of mining; however, all have the potential to relate to pre-1900 activity, or include features that relate to earlier phases of mining in the case of those sites known to have been active during the twentieth century (for example G41/277) and as such all are considered potentially archaeological until investigations prove otherwise. Parts of the project area fall within the Bendigo Quartz Reef Historic Area (List ID 9097) and an overlapping but broader area falls under the Bendigo Conservation Covenant, highlighting the significance of this landscape.

NZHP undertook numerous pedestrian surveys of the project area as well as the wider landscape and also utilised aerial photography and LiDAR data to identify existing and new archaeological and heritage sites; however, the potential exists for further sites to be identified during the proposed works. These include more ephemeral features such as prospecting pits, hut or tent sites, artefact deposits and sites relating to manawhenua activity in the area that may have been obscured by vegetation or only remain as subsurface features.

When considered alongside the wider archaeological and heritage context, the current project area is representative of the broader Bendigo mining landscape, featuring a similar breakdown of site types. The exception is the relatively high number of culverts and roading features, which could be taken to show the Rise and Shine Valley's importance as a transportation route thanks to Thomsons Saddle at the east end; however, this is potentially also due to these features not being the focus of surveys or site recording projects in the wider landscape, particularly within the Bendigo Quartz Reef Historic Area where the focus is on mining. Overall, the heritage values within

the BOGP footprint are replicated in the wider Bendigo area, with other examples of all features of similar or higher heritage value located elsewhere in the Bendigo Quartz Reefs Historic Area and/or Bendigo Covenant Area. These sites are also generally better maintained, more accessible and experience higher visitor traffic than those sites found within the current project area.

As an aid to best understanding the archaeological and heritage values of the landscape, the project area can be considered as a collection of distinct site complexes:

- Mclean's pre-emptive rights site complex (G41/4 and G41/5)
- The Rise and Shine workings (G41/264, G41/265, G41/266, G41/267, G41/269, G41/273, G41/277, G41/584, G41/606, G41/658 and G41/783)
- The Come-in-Time workings (G41/251, G41/256, G41/586, G41/589, G41/604 and G41/605)
- The Shepherds Creek workings (G41/6, G41/678, G41/784, G41/785, G41/786, G41/787, G41/788, G41/789, G41/790 and G41/792)
- The Matakanui-Bendigo Road (G41/782)

8.1 Constraints and Limitations

Some minor constraints were experienced during the research for this assessment. Detailed historical records of the mining operations, other than written reports in contemporary newspapers, were limited; however, comprehensive research undertaken by previous parties allowed for a base understanding of the project area's history that could be supplemented with details from these sources. Similarly, there was limited photographic evidence of pre-1900 activity throughout the project area. The site surveys within the project area comprised a combination of 10m transects and focused surveys of previously recorded sites, but vegetation and topography meant some gullies were unable to be systematically investigated. These visibility and access constraints were able to be offset through the use of the LiDAR imagery and aerial photographs, which help to identify landscape modifications and structures. Despite these minor limitations, a thorough understanding of the history of the project area and the archaeological and heritage features within it were able to be developed.

Two previously recorded sites within the current project area (G41/273 and G41/606) were unable to be relocated during the pedestrian surveys, but were able to be located using the aerial photographs and LiDAR data. Both had low profiles and were in areas of thick vegetation. This also suggests that there may be more sites like these (for example artefact scatters) that were similarly obscured. The repeated survey of the project area over multiple years and seasons, on top of the previous surveys, go some way to offset this limitation.

9 Heritage and Archaeological Values

Historic places in Aotearoa are assessed using a recognised heritage values system, with the current HNZPT assessment criteria used for the New Zealand Heritage List (Heritage New Zealand Pouhere Taonga, 2019). These criteria relate to historical, cultural, aesthetic, archaeological, architectural, scientific, social, spiritual, technological, and traditional significance, or values. Parts of the project area have already been recognised for their heritage values, in the form of their inclusion in the Bendigo Quartz Reefs Historic Area (List No. 9097) and/or the Bendigo Conservation Covenant area.

The Historic Area has been previously recognised for its **high aesthetic, historical, archaeological**, and **technological values**. These values are a result of the significant landscape transformations caused by historic mining and the remoteness of the once bustling area in the present day, the numerous important events tied to the industrial history of Otago and New Zealand such as the 1881 miner's strike, the wealth of varied archaeological remains and the presence of good examples of all forms of mining technologies utilised in this area (Bauchop, 2015). The majority of both these areas lie outside the project area, with the portion falling within (the Rise and Shien Valey) being located in the most remote section and outside the Bendigo historic reserve where the values are considered to be the highest. **NZHP considers this to be an accurate reflection of the historic area's heritage values and can be applied to the Bendigo Conservation Covenant Area,** both of which directly drew from the values described by Jill Hamel in her 1993 report.

The Bendigo Conservation Covenant notes that the Rise and Shine Creek area is of particular historical value due to the rich landscape of historic mining features and has measures in place (Condition 9a-d) to ensure the public have access to these sites. The Covenant (Condition 10) acknowledges that "the principal historic values outside the Rise and Shine Creek area comprise three stone buildings near Ardgour Road, stone yards near Shepherds Creek, the hotel foundations and environs and the bakery in the Town of Bendigo, the dam and dam keeper's hut at the head of the Aurora Creek, various mining sites in Perrys Creek and the environs, and the stone yards near Devils Creek." Of this list, one of the stone buildings (G41/4) and the stone yards (G41/5) are the only sites that fall within the project area, and neither of these are located within a land parcel covered by the Covenant.

The Rise and Shine Valley is associated with a known network of ara tawhito and is likely of cultural importance to the local rūnaka; however, this is not an assessment of those values, which can only be provided by manawhenua. **NZHP recommends that consultation be undertaken with takata whenua as part of the wider plans for the project, and a cultural values statement prepared.**

The heritage values for each site complex identified in Section 8 are discussed below in accordance with the methodology discussed in Section 3.3, along with an assessment of the archaeological values of each recorded site within these complexes. This chapter ends with a summary of the values of the project area.

9.1 Values of McLean's Pre-Emptive Rights Site Complex

Two recorded sites located on the flats to the south of Shepherds Creek relate to the project area's place as part of the larger Morven Hills Station. The hut (G41/4) and stockyards (G41/5) are the oldest known physical remains of human activity within the project area, and the only features that can be confidently attributed to pastoral occupation. Both sites relate to the early attempts by John McLean to secure the rights to lease what would become the Morven Hills Station. While both sites sit outside the listed and Covenant area, both have been previously recognised for their significant heritage value, including being mentioned in the Covenant (Condition 10) as being key and valuable components of the Bendigo landscape. NZHP has assessed this site complex to hold **medium-high heritage values**, as summarised in Table 9-1.

Table 9-1. Summary of assessment of heritage values for site G41/4.

Criteria	Assessment
Aesthetic significance or value	**Medium-high.** This site complex is a prominent feature of the landscape.
Archaeological significance or value	**Medium-high.** This complex of sites is associated with the earliest pastoral occupation of the project area and comprises two features identified as holding medium-high archaeological value.
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	**Medium-high**: This hut is associated with the establishment of the Morven Hills Station, the first pastoral run in this area.
Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.1.1 Archaeological Values of Site G41/4 (Rabbiter's Hut)

Site G41/4 is the only hut site within the project area associated with the earliest phase of pastoral occupation in the area and is in good condition (though has been modified in the late twentieth or early twenty-first century). This hut is a prominent feature of the local landscape and is still used as a temporary shelter, and as a result is considered to have **medium-high archaeological values**.

Table 9-2. Summary of archaeological values for site G41/4.

Value	Assessment
Condition	**Good**: G41/4 is in good condition despite some modern modifications and is still in use.
Rarity or Uniqueness	**Medium**: Though hut sites are common, huts associated with this phase of pastoral activity in the area are less so.
Contextual Value	**High:** This hut is associated with the earliest pastoral occupation of the project area as part of what would become the Morven Hills Station.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this hut include: • How have the twentieth and twenty-first century modifications altered the heritage fabric of the hut? • How much heritage fabric survives in this hut? • Are there any key similarities or differences between this and huts associated with goldminers?
Amenity Value	**Medium-High**: This site is a prominent feature of the landscape and holds significant potential for public interpretation and education.
Cultural Associations	Pākehā

9.1.2 Archaeological Values of Site G41/5 (Stockyards)

Site G41/5 is one of only two pastoral sites within the project area and is in good condition. These yards are a prominent feature of the local landscape and have been fenced off to protect them from stock damage, and as a result is considered to have **medium-high archaeological values**.

Table 9-3. Summary of assessment of heritage values for site G41/5.

Value	Assessment
Condition	**Good**: G41/5 is in good condition and currently protected by a fence.
Rarity or Uniqueness	**Medium**: Other similar examples have been recorded in the Morven Hills area, but at least one of those sites has since been destroyed.
Contextual Value	**High:** This hut is associated with the earliest pastoral occupation of the project area as part of what would become the Morven Hills Station.

Value	Assessment
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this site include: • Can we determine an approximate date of construction for the yards? • How does the construction technique used for these yards compare with other local examples?
Amenity Value	**Medium-High**: This site is a prominent feature of the landscape and holds significant potential for public interpretation and education.
Cultural Associations	Pākehā

9.2 Values of the Rise and Shine Workings

The Rise and Shine workings comprises a largely intact gold mining landscape that displays an almost continuous sequence of mining technologies from the early prospecting and alluvial mining in the 1860s through to depression era quartz mining. All working in this area, and indeed those further downstream, were made possible by the Rise and Shine water race that passes through this area. Alongside the physical scars of these works are remains of the homes built by the miners, ranging from ephemeral terraces to ruinous stone huts. This complex of inter-related sites has been previously recognised for its significant heritage value through its inclusion in the Bendigo Quartz Reefs Historic Area and the Bendigo Conservation Covenant area. NZHP has assessed this site complex to hold **high heritage values**, as summarised in Table 9-4.

Table 9-4. Summary of assessment of heritage values for Rise and Shine workings.

Criteria	Assessment
Aesthetic significance or value	**Medium.** The aesthetic values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Quartz Reefs Historic Area and the Bendigo Conservation Covenant area; however, this complex of sites is less visible, accessible and maintained than other portions of the Historic Area.
Archaeological significance or value	Overall NZHP considers the **Rise and Shine Valley to have high archaeological values** due to the rich and varied archaeological landscape that includes representative features of many aspects of early alluvial and quartz gold mining. These include sluicing and tailings/mullock piles, battery foundations, adits, water management systems, infrastructure in the form of early tracks, and residences of the miners. All these sites can be associated with known syndicates, increasing their potential to provide meaningful information and stories through archaeological investigation.
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	The Rise and Shine Valley has **high historical significance** as part of the previously recognised Historic Area due to the presence of workings associated with key figures and syndicates in the mining history of the Bendigo area.
Scientific significance or value	n/a
Social significance or value	The Rise and Shine workings area comprises a rich nineteenth and twentieth century gold mining landscape, with a wide range of representative features spanning from the 1860s through to the mid-twentieth century. Otago gold mining landscapes such as this are valued by community groups including the Otago Goldfields Heritage Trust (OGHT). While the OGHT places most value in sites that are more accessible and complete those within this site complex, they value all Otago gold mining heritage sites and landscapes. The Rise and Shine workings therefore holds **medium social values and NZHP recommends OGHT are actively included in the management and recording of the heritage sites.**
Spiritual significance or value	n/a
Technological significance or value	The Rise and Shine workings hold **high technological value** due to the presence of examples of a clear sequence of mining processes and features that were used in the Bendigo area from the 1860s through to the 1930s. This area has been previously recognised as holding such values by researchers including Hamel (1993), Carpenter (2012) and Schmidt and Briden (2012). Carpenter (2012) places particular emphasis on the value of the Rise and Shine water race (G41/584) as an important technical feature of the landscape given its long use-life and the reliance on this race by almost all mining syndicates in this valley. The Rise and Shine dam (G41/269) can be

	considered to hold technological value as an example of how dam building practices were adapted to suit this environment and landscape. Finally, the Rise and Shien mine and battery (G41/277) also holds this type of significance due to the multiple phases of identified mining, and particularly stamper battery, technology.
Traditional significance or value	n/a

9.2.1 Archaeological Values of Site G41/264 (Rise and Shine Gold Workings)

Site G41/264 records multiple alluvial mining features across a wide area and is considered to be of **medium archaeological value**. Site G41/264 records an extensively worked area on the valley south of the Rise and Shine Creek. While modern mining has modified localised parts of the site, much of the site appears to be in fair condition while NZHP surveys, aerials and LiDAR imagery show that the site, in particular the sluicing areas, still extend further up the hills of the valley as shown in Hamel's (1993) plans. This site is visible and the public road passes through it, though it is currently overgrown with grass and low scrub.

Table 9-5. Summary of assessment of archaeological values for site G41/264.

Value	Assessment
Condition	**Fair**: This site has been modified by twentieth century mining and farming activity, though many visible features remain.
Rarity or Uniqueness	**Medium**: This a common site type in Otago, with multiple comparable examples located in the local area (eg. Site F41/104, G41/301, G41/554, G41/745) but this is a good example of a mid to late nineteenth century alluvial gold mining complex that can be associated with a known mining syndicate (Rise and Shine) and is relatively intact.
Contextual Value	**High:** The site has contextual value when considered as a physical record of the Rise and Shine company's workings, but also as a component of the larger, interconnected mining landscape.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this site include: • Is it possible to identify specific mining methods and any changes in these through time and/or space? • Is there any evidence of distinctly Swedish mining practices? • How did the mining landscape develop over time? Are phases discernible?
Amenity Value	**Medium:** The amenity values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Quartz Reefs Historic Area. A public road (Thomson Gorege Road) passes through the site; however, this site is less visible, accessible and maintained than other sites within the Historic Area, and as a result its potential for interpretation and public education is lower than other sites in the Historic Area. The features associated with this site, including areas of sluicing, tailings/mullocks and small water races are not obvious to most site visitors due to vegetation cover.
Cultural Associations	Pākehā

9.2.2 Archaeological Values of Sites G41/265, G41/266 and G41/267 (Stone Huts)

G41/265, G41/266 and G41/267 are the remains of stone huts located within the extent of the larger mining complex (G41/264) and may provide a unique insight into the relationship of between mining and domestic activities. Stone hut sites are important places of domestic activity, where social, cultural, and economic values can be better identified. Accordingly, sites G41/266, G41/265 and G41/267 have been assessed to have **medium archaeological value.**

Table 9-6. Summary of assessment of archaeological values for site G41/265, G41/266 and G41/267.

Value	Assessment
Condition	**Fair**: These huts survive as partial ruins; however, the remaining portions are in good condition.
Rarity or Uniqueness	**Low**: Huts such as these are a very common archaeological site type in Otago, especially those in a similar ruinous condition.

Value	Assessment
Contextual Value	**Medium-High:** These huts exist within a complex of associated mining sites and features and should be considered an integral part of the Rise and Shine archaeological landscape. Unlike other areas within the Thomson Gorge, this area was not intensively revisited by later mining operations, and as such the huts can be confidently associated with the Rise and Shine syndicate's works.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this site include: • How were the Rise and Shine miners organising their domestic space? • Are there any key similarities or differences between the huts that could identify their occupants? • What was life like for the Rise and Shine miners and their families? • Are there any differences between the Rise and Shine huts that may provide evidence about chronology or identity of the occupants?
Amenity Value	**Low:** The amenity values of these sites have been previously recognised through their inclusion in the Bendigo Quartz Reefs Historic Area. A public road (Thomson Gorge Road) passes close to these hut sites, especially G41/265; however, the topography and vegetation cover means they are not visible from this road and require specialist equipment (e.g. GPS) or knowledge to locate. They therefore hold limited potential for public interpretation and education.
Cultural Associations	Pākehā

9.2.3 Archaeological Values of Site G41/269 (Rise and Shine Dam)

The Rise and Shine dam (G41/269) is considered to be of **medium archaeological value**. The site is situated within a wider alluvial gold mining site of G41/264 and contributes to the wider understanding of the Rise and Shine Company's mining practices throughout this landscape. As the recent surveys and LiDAR imagery indicates, this site exists in good condition, is only a short walk from the road and is highly visible.

Table 9-7. Summary of assessment of archaeological values for site G41/269.

Value	Assessment
Condition	**Good:** The dam is in good condition.
Rarity or Uniqueness	**Medium:** This site is a good example of a substantial nineteenth century mining dam (a relatively common site type in Otago). In total, 230 dams have been previously recorded in Otago, and while many have not been described in detail, at least 56 are stone-faced.
Contextual Value	**High:** This site exists within a complex of associated mining sites and features and should be considered an integral part of the Rise and Shine archaeological landscape. Unlike other areas within the Thomson Gorge, this area was not intensively revisited by later mining operations, and as such the dam can be confidently associated with the Rise and Shine syndicate's works.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this site include: • How was the dam constructed? • Is this dam typical of nineteenth century dam construction in New Zealand?
Amenity Value	**Medium.** The amenity values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Quartz Reefs Historic Area. A public road (Thomson Gorge Road) passes 130m to the north of this site, but the topography and vegetation cover means this feature is not currently visible from the road. The dam face is; however, a landmark feature of the local landscape and holds some potential for public interpretation and education through signage or publication of its history, construction methods and form.
Cultural Associations	Pākehā

9.2.4 Archaeological Values of Sites G41/273 and G41/606 (Stone Huts)

A cluster of stone huts on the floor of the Rise and Shine Valley, two of which (G41/273 and G41/606) fall within the project area, have the potential to provide insight into the domestic side of the nineteenth century occupation of the project area. Stone huts G41/273 and G41/606 were unable to be relocated during the survey; however, their archaeological values have been assessed as **low-medium** based on previous records of the sites due to their

ruinous condition, poor visibility and lack of clear association with a known phase of activity. Despite this, stone huts such as these are key and treasured features of the Bendigo landscape.

Table 9-8. Summary of assessment of archaeological values for sites G41/273 and G41/606.

Value	Assessment
Condition	**Unknown**: These huts have been unable to be relocated by NZHP, but were both recorded as in poor condition when they were last located in 2005.
Rarity or Uniqueness	**Low**: Huts such as these are a very common archaeological site type in Otago, especially those in a similar ruinous condition.
Contextual Value	**Medium:** Sites G41/273 and G41/606 could not be directly linked to a known mining syndicate or period; however, they are located in a cluster suggesting they have some contextual value as a site complex.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of these sites include: • Are there any key similarities or differences between these and other huts that could identify the occupants? • What was life like for the occupants of these huts?
Amenity Value	**Low:** Sites G41/273 and G41/606 fall within the Bendigo Quartz Reefs Historic Area that has been previously recognised for its aesthetic and amenity value. However, these sites are not currently visible, and therefore hold limited potential for public interpretation and education. Material recovered from these sites may be suitable for public display.
Cultural Associations	Pākehā

9.2.5 Archaeological Values of Site G41/277 (Rise and Shine Mine and Battery)

Site G41/277 records multiple alluvial and quartz mining features across a wide area and is considered to be of **medium archaeological value**. While modern mining has modified localised parts of the site, much of the site appears to be in fair condition. This site is visible and the public road passes through it, though it is currently overgrown with grass and low scrub.

Table 9-9. Summary of assessment of archaeological values of site G41/277.

Value	Assessment
Condition	**Fair**: Intensive twentieth century mining has taken place across this site, likely modifying many of the pre-1900 features.
Rarity or Uniqueness	**Low**: This site is a good example of a mid to late nineteenth century Pākehā alluvial and quartz gold mining complex (a common site type in Otago).
Contextual Value	**Medium**: The site has contextual value when considered as a component of the larger, interconnected mining landscape.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of these sites include: • Is it possible to identify surviving pre-1900 features within the site? • Can specific mining methods and any changes in these through time and/or space be identified? • How did the mining landscape develop over time? Are phases discernible?
Amenity Value	**Medium:** The amenity values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Quartz Reefs Historic Area; however, this site is less visible, accessible and maintained than other sites within the Historic Area, and as a result its potential for interpretation and public education is lower than other sites in the Historic Area. A public road (Thomson Gorege Road) passes through the site; however, this site is less visible, accessible and maintained than other sites within the Historic Area, and as a result its potential for interpretation and public education is lower than other sites in the Historic Area. Some features of this site, such as the battery foundations, are easily identifiable, but others, including adits, tailings/mullocks and small water races are not obvious to most site visitors due to vegetation cover. Most of the visible features also relate to the twentieth century phases of activity at the site, as such the amenity value is tied to these and not necessarily the archaeological components.

Value	Assessment
Cultural Associations	Pākehā

9.2.6 Archaeological Values of Site G41/584 (Rise and Shine Water Race)

Site G41/584 (The Rise and Shine Water Race) has been identified to be of **medium archaeological value** as it is associated with the earliest mining activity throughout the project and wider Bendigo area. While sections of the race are overgrown, impacted by access roads and modern mining, large sections survive in good condition and are easily accessible from the public road.

Table 9-10. Summary of assessment of archaeological values for site G41/584.

Value	Assessment
Condition	**Good**: Portions of the races are in good condition while others have been disturbed or destroyed through erosion, stock trampling, vegetation growth and the formation of Thomson Gorge Road. The sections that pass through the project area is in fair condition, with some intact sections and some disturbed stretches
Rarity or Uniqueness	**Low**: Water races are extremely common archaeological features.
Contextual Value	**High:** This race exists within a complex of associated mining sites and features and should be considered an integral part of the Rise and Shine archaeological landscape. Unlike other areas within the Thomson Gorge, this area was not intensively revisited by later mining operations, and as such the race can be confidently associated with the Rise and Shine Syndicate's works and is known to be one of the earliest mining features in this area.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of this site include: • How were the races constructed and is there evidence of different phases?
Amenity Value	**Low**: Parts of the race are visible from the public road (Thomsons Gorge Road); however, this is not an easy landscape feature for members of the general public to identify without guidance. It therefore holds limited potential for public interpretation and education in its current state.
Cultural Associations	Pākehā

9.2.7 Archaeological Values of Site G41/658 (Hut Terrace)

One potential hut terrace site without visible structural remains was recorded within what would later become the wider extent of site G41/264 (Rise and Shine Gold Workings). This site has the potential to contribute to understandings of nineteenth or early twentieth century occupation in the survey area relating to mining activity. Due to the common nature of hut sites with surface remains throughout the wider area, G41/658 has been assessed to have **low-medium archaeological value.**

Table 9-11. Summary of assessment of archaeological values for site G41/658.

Value	Assessment
Condition	**Good**: The terrace, bank and pit were in good condition, and the presence of surface artefacts suggests subsurface remains may be present in the area
Rarity or Uniqueness	**Low**: Huts sites are common in the Bendigo and wider Otago area.
Contextual Value	**Medium-high:** The site exists within a complex of associated mining sites and features and should be considered an integral part of the Rise and Shine archaeological landscape. Unlike other areas within the Thomson Gorge, this area was not intensively revisited by later mining operations, and as such the site can be confidently associated with the Rise and Shine syndicate's works

Value	Assessment
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this site include: • How were the Rise and Shine miners organising their domestic space? • Are there any key similarities or differences between the site and other occupation sites that could identify their occupants? • What was life like for the Rise and Shine miners and their families?
Amenity Value	**Low.** This site falls within the Bendigo Quartz Reefs Historic Area that has been previously recognised for its aesthetic value. However, this is not an easy landscape feature for members of the general public to identify without specialist guidance. It therefore holds limited potential for public interpretation and education.
Cultural Associations	Pākehā

9.2.8 Archaeological Values of Site G41/783 (Track)

This track, possibly representing an earlier alignment of Thompson Gorge Road or one of the preceding pack tracks through the valley, is considered to have **low archaeological value**. This is due to the common nature of this type of feature and the limited aesthetic value.

Table 9-12. Summary of assessment of archaeological values for site G41/783.

Value	Assessment
Condition	**Fair:** The track has been modified and worn down by stock and erosion, but its alignment is clearly visible for the recorded extent.
Rarity or Uniqueness	**Low**: Pre-1900 roads and tracks are a common site type.
Contextual Value	**Unknown:** It is not clear if this track was formed pre- or post-1900 and so investigations must be undertaken in an attempt to determine this. If it is pre-1900, it may represent an earlier alignment of the Thomson Gorge Road. It also possesses some contextual value due to its association with the development of transport infrastructure in this area.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of this site include: • Is it possible to determine if this track was constructed pre-1900?
Amenity Value	**Low.** This site is included in the Bendigo Conservation Covenant area and has therefore been recognised as holding some amenity value, though the track itself has not previously been identified as a key landscape feature. This site is on private land, but a public road (Thomson Gorege Road) passes to the south and the site can be viewed from here. However, the track alignment is not easily discerned from this viewpoint and requires specialist knowledge or equipment to locate, limiting the potential for engagement by the general public.
Cultural Associations	Pākehā

9.3 Values of The Come-in-Time Area

The Come-in-Time workings includes a complex of sites linked through their reliance on the Come-in-Time water race (G41/586), which is in turn was fed by the Rise and Shine race. This complex includes examples of areas of alluvial and quartz mining and the associated infrastructure, and includes one site (the Come-in-Time battery) that is regularly engaged with by the public. Unlike the Rise and Shine area discussed above, there are no previously recorded domestic sites within this site complex, and as such has a far more industrial feel than the almost bucolic scenes further up the valley. This complex of inter-related sites has been previously recognised for its significant heritage value through its inclusion in the Bendigo Conservation Covenant area and partial inclusion in the Bendigo Quartz Reefs Historic Area. NZHP has assessed this site complex to hold **high heritage values**, as summarised in Table 9-4.

Table 9-13. Summary of assessment of heritage values of the Come-in-Time workings.

Criteria	Assessment
Aesthetic significance or value	**High.** The aesthetic values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Quartz Reefs Historic Area (part of G41/251 only) and the Bendigo Conservation Covenant area, and the efforts put in to reconstruct the stamper battery and install interpretive signage.
Archaeological significance or value	**Medium-High.** Alluvial and quartz mining sites are common in Otago, but this area includes four distinct pockets of workings, one of which (G41/251) is in very good condition, as well as the water race that enabled them all. Most of these sites can be associated with known syndicates, increasing their potential to provide meaningful information and stories through archaeological investigation, and those that are not may be able to be better understood following such investigation.
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	The Come-in-Time workings have **high historical significance** as part of the previously recognised Historic and Covenant Areas due to the presence of workings associated with key figures and syndicates in the mining history of the Bendigo area.
Scientific significance or value	n/a
Social significance or value	The Come-in-Time area comprises a rich nineteenth and twentieth century gold mining landscape, with a wide range of representative features spanning from at least the 1870s through to the present day. Otago gold mining landscapes such as this are valued by community groups including the Otago Goldfields Heritage Trust (OGHT), who have been actively engaged with maintaining and ensuing public access to one site that falls partially within this area (G41/251). The Come-in-Time area therefore holds **medium social values and NZHP recommends OGHT are actively included in the management and recording of the heritage sites.**
Spiritual significance or value	n/a
Technological significance or value	The Come-in-Time area holds **medium-high technological value** due to the presence of examples of multiple mining processes and features that were used in the Bendigo area from the 1870s through to the 1930s. This area has been previously recognised as holding such by researchers including Hamel (1993) and Carpenter (2012). There is potential at least one site (G41/604) includes remains of a turbine that is significant technologically and not well represented elsewhere, though this has never been confirmed. Multiple types of stamper battery are also present within this complex of sites, forming a technological sequence.
Traditional significance or value	n/a

9.3.1 Archaeological Values of Site G41/251 (Come-in-Time Battery)

Site G41/251 records a complex of quartz mining features including mine drives, remains of tramways, adits and a refurbished stamper battery, and is considered to be of **medium-high archaeological value**. This site is in good condition, despite overgrown vegetation, and a battery is still located at the site.

Table 9-14. Summary of assessment of archaeological values for site G41/251.

Value	Assessment
Condition	**Good**: This site is in good condition though has been modified by two phases of post-1900 mining in the 1900s and 1930s, and has been recently partially reconstructed by the Otago Goldfields Heritage Trust.
Rarity or Uniqueness	**Low-Medium**: Battery and quartz mining sites are common in Otago, but this is a good example.
Contextual Value	**High:** The site has known association one phase of pre-1900 Pākehā mining (the Come-in-Time Syndicate). The site has contextual value both when considered as a site complex and also when considered as a component of the larger, interconnected mining landscape.
Information Potential	**Medium-High:** Potential research questions able to be considered through archaeological investigations of this site include: • Is it possible to identify surviving pre-1900 features within the site? • Can specific mining methods and any changes in these through time and/or space be identified? • How did the mining landscape develop over time? Are phases discernible?

Value	Assessment
Amenity Value	**Medium-High:** The amenity values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Quartz Reefs Historic Area and the efforts put in to reconstruct the stamper battery and install interpretive signage, reaffirming the potential for this site to engage the public's interest.
Cultural Associations	Pākehā

9.3.2 Archaeological Values of Site G41/256 (Gold Workings)

This site is considered to have **low heritage value**. This is due to the common nature of this type of feature in the landscape and the lack of aesthetic value.

Table 9-15. Summary of assessment of heritage values for site G41/256.

Criteria	Assessment
Aesthetic significance or value	**Low.** This site is not obviously visible to the general public and is heavily overgrown.
Archaeological significance or value	**Low:** Small complexes of alluvial gold workings are common in this area as well as in the wider Otago region, and this site appears to be in poor condition. This site has yet to be associated with a known phase of gold working or cultural group but do possess some contextual value as a component of the larger, interconnected mining landscape. Potential research questions able to be considered through archaeological investigations of this site include: • How did the mining landscape develop over time? Are phases discernible?
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	**Low**: The site holds limited historical value as a feature of the historical mining landscape.
Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.3.3 Archaeological Values of Site G41/586 (Come-in-Time Water Race)

Site G41/586 (The Come-in-Time Water Race) has been identified to be of **medium heritage value** as it is a key component of the Bendigo mining landscape and integral to the story of this area's industrial past. While sections of the race are overgrown, impacted by access roads and modern mining, large sections survive in good condition and are easily accessible from the public road.

Table 9-16. Summary of assessment of heritage values for site G41/586.

Criteria	Assessment
Aesthetic significance or value	**Low.** Parts of the race are visible from the public road (Thomsons Gorge Road); however, this is a relatively unobtrusive landscape feature.
Archaeological significance or value	**Medium.** Water races are extremely common archaeological features. The Come-in-Time race is associated with the 1880s claim belonging to John Kane and was re-used by several groups through to at least 1910. The race is an integral feature of the historical mining landscape of the Come-in-Time area. Portions of the race are in good condition while others have been disturbed or destroyed. The section that pass through the project area is in fair condition, with some intact sections and some disturbed stretches. Potential research questions able to be considered through archaeological investigations of this race include: • How was the race constructed and is there evidence of different phases?
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	**Medium**: This race can be confidently associated with John Kane.

Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.3.4 Archaeological Values of Site G41/589 (Revetted Road)

Pathways, tracks and roads can inform understandings wider interactions between various nineteenth or early twentieth century mining and pastoral activity in the area and can provide insight into the utilisation of the landscape across the wider area. Such sites are relatively common, recorded on their own or as part of a larger site. Thus, site G41/589 has been assessed to have **low heritage value**.

Table 9-17. Summary of assessment of heritage values for site G41/589.

Criteria	Assessment
Aesthetic significance or value	n/a
Archaeological significance or value	**Low.** The revetted road (a very common site type) is in good condition and is a feature of the wider archaeological landscape. It is difficult to associate this feature with a time period, cultural group or activity type, and it is not readily visible to the general public. Potential research questions able to be considered for this site are: • How were the revetments constructed? • Can these features be associated with known phases of mining or pastoral activity in the project area?
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	**Low.** The site holds limited historical value as a feature of the historical mining landscape.
Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.3.5 Archaeological Values of Site G41/604 (Battery and Turbine)

The workings recorded as G41/604 have been tentatively associated with the early twentieth century Alta syndicate and David Betts' 1930s mining operation; however, there was intensive earlier mining activity in this area and there may be parts of the site that relate to previous phases of activity. The site has some contextual value when considered as a component of the larger, interconnected mining landscape and thus have **medium heritage values.**

Table 9-18. Summary of assessment of heritage values for site G41/604.

Criteria	Assessment
Aesthetic significance or value	**Moderate.** The aesthetic values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Conservation Covenant area.
Archaeological significance or value	**Low-Moderate.** Late twentieth century roading, mining and farming activities have disturbed parts of the site, but some identifiable features remain intact. Gold mining workings such as this are relatively common in Otago and these two are known to be associated with Pākehā activity. Potential research questions able to be considered through archaeological investigations of the site include: • Is it possible to identify which components of this site are pre-1900 and therefore archaeological? • Is it possible to identify specific mining methods and any changes in these through time and/or space? • How did the mining landscape develop over time? Are phases discernible?
Architectural significance or value	n/a
Cultural significance or value	n/a

Historical significance or value	**Moderate**: The workings recorded as G41/604 can be tentatively associated with the Alta syndicate's operations in the early twentieth century, as well as potentially the earlier Come-in-Time syndicate under John Kane.
Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.3.6 Archaeological Values of Site G41/605 (Mining Workings)

The workings recorded as G41/605 have been tentatively associated with the early twentieth century Alta syndicate and David Betts' 1930s mining operation; however, there was intensive earlier mining activity in this area and there may be parts of the site that relate to previous phases of activity. The site has some contextual value when considered as a component of the larger, interconnected mining landscape and thus has **medium heritage values.**

Table 9-19. Summary of assessment of heritage values for site G41/605.

Criteria	Assessment
Aesthetic significance or value	**Moderate.** The aesthetic values of this gold mining complex have been previously recognised through its inclusion in the Bendigo Conservation Covenant area.
Archaeological significance or value	**Low-Moderate.** Late twentieth century roading, mining and farming activities have disturbed parts of the site, but some identifiable features remain intact. Gold mining workings such as this are relatively common in Otago and these two are known to be associated with Pākehā activity. Potential research questions able to be considered through archaeological investigations of the site include: • Is it possible to identify which components of this site are pre-1900 and therefore archaeological? • Is it possible to identify specific mining methods and any changes in these through time and/or space? • How did the mining landscape develop over time? Are phases discernible?
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	**Moderate**: The workings recorded as G41/605 can be tentatively associated with the Alta syndicate's operations in the early twentieth century, as well as potentially the earlier Come-in-Time syndicate under John Kane.
Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.4 Values of the Shepherds Creek Area

Shepherds Creek Valley has not previously been recognised as holding significant heritage values. This is likely due to the notably lower density of heritage and/or archaeological sites, and its relative inaccessibility compared to the valleys and flats to the south and west. Prior to the surveys undertaken by NZHP, no sites had been recorded in this valley, and no previous surveys by archaeologists or other heritage consultants had been undertaken past the identification of one water race on the flat (G41/6). This area also sits outside the Bendigo Conservation Covenant area. Despite this lack of prior recognition, this valley does contain evidence of small-scale prospecting and mining, as well as hut sites that may relate to mining and/or mustering activities, and as such forms a key, if peripheral, component of the wider Bendigo heritage and archaeological landscape. As summarised in Table 9-20, NZHP considers Shepherds Creek valley to hold **medium heritage values.**

Table 9-20. Summary of assessment of heritage values for Shepherds Creek.

Criteria	Assessment
Aesthetic significance or value	**Medium**: The Shepherds Creek valley features the same rugged landscape as the neighbouring areas covered by the Historic Area and Covenant. Imposing schist outcrops scattered around a low-density pastoral landscape of grass and low shrubs is punctuated, albeit at a much lower overall density to those

	areas discussed above, by picturesque stonework features including hut ruins and the remains of small scale mining activities. This landscape is more characteristic of what the earliest miners would have experienced prior to the large scale sluicing and water diversion activities began in the Rise and Shine, as there was not enough easily won gold for works to reach that stage. The localised areas of larger native vegetation such as matagouri and isolated kōwhai provide a glimpse of how the area looked prior to arrival of Pākehā.
Archaeological significance or value	The Shepherds Creek valley has not previously been a focus of archaeological investigation, but NZHP have identified potential archaeological features during surveys of these valleys and the surrounding ridges, including hut sites and evidence of small-scale mining activity. This area therefore holds **medium archaeological value** as investigations here would add to our limited understanding of activities undertaken here.
Architectural significance or value	n/a
Cultural significance or value	n/a
Historical significance or value	**Low**: The site holds limited historical value as a feature of the broader historical mining landscape.
Scientific significance or value	n/a
Social significance or value	n/a
Spiritual significance or value	n/a
Technological significance or value	n/a
Traditional significance or value	n/a

9.4.1 Archaeological Values of Site G41/6 (Water Race)

Site G41/6 is considered to hold **low archaeological value** as this site type is common in the Bendigo mining landscape and while integral to the story of this area's industrial and/or pastoral past, it was not possible to directly link this site to an activity or period. While sections of the race are overgrown, impacted by access roads and modern mining, large sections survive in good condition and are easily accessible from the public road.

Table 9-21. Summary of assessment of archaeological values for site G41/6.

Value	Assessment
Condition	**Good**: Portions of the races are in good condition while others have been disturbed or destroyed by the formation of Thomson Gorge Road. The sections that pass through the project area is in fair condition, with some intact sections and some disturbed stretches
Rarity or Uniqueness	**Low**: Water races are extremely common archaeological features.
Contextual Value	**Low-Medium:** This race has not been able to be associated with a known individual or syndicate, but does hold some contextual value as an integral feature of the historical mining landscape of the Shepherds Creek and wider Bendigo area.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of this site include: • How were the races constructed and is there evidence of different phases?
Amenity Value	**Low**: Parts of the race are visible from the public road (Thomsons Gorge Road); however, this road is infrequently used by the public and this is not an easy landscape feature for members of the general public to identify without guidance. It therefore holds limited potential for public interpretation and education.
Cultural Associations	Pākehā

9.4.2 Archaeological Values of Site G41/678 (Stone Hut)

Hut sites are relatively common and provide insight into the domestic side of the nineteenth century occupation of the Shepherds Creek area. Hut sites are important places of domestic activity, where social, cultural, and economic values can be better identified. Accordingly, site G41/678 has been assessed to have **medium archaeological value**.

Table 9-22. Summary of archaeological value for site G41/678.

Value	Assessment
Condition	**Fair**: G41/678 survives as partial ruins; however, the remaining portions are in good condition.
Rarity or Uniqueness	**Medium**: Site G41/678 is representative of the type of hut remains that are common in the Bendigo area; however, few have been recorded in the Shepherds Creek valley.
Contextual Value	**Low-Medium:** Hut G41/678 could not be directly linked to a known mining syndicate or period, but exists within a complex of mining sites and features and should be considered an integral part of the Shepherds Creek and wider Bendigo archaeological landscape. It is not possible to confirm at this stage if this hut relates to mining or mustering activity, or both.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of this hut include: • Are there any key similarities or differences between these and other huts that could identify the occupants? • What was life like for the occupants of these huts?
Amenity Value	**Medium**: Hut G41/678 is not accessible via public roads but is an obvious feature of the lower Shepherds Creek landscape.
Cultural Associations	The ethnicity of the miners in the Shepherds Creek valley is unknown.

9.4.3 Archaeological Values of Sites G41/784, G41/785 and G41/786 (Hut Sites)

Hut sites G41/784, G41/785 and G41/786 have the potential to contribute to understandings of nineteenth or early twentieth century occupation in the Shepherds Creek area relating to mining activity. Due to the common nature of hut sites with surface remains throughout the wider area, these sites have been assessed to have **low archaeological value.**

Table 9-23. Summary of assessment of archaeological values for sites G41/784, G41/785 and G41/786.

Value	Assessment
Condition	**Fair**: The only visible remains of these sites were two raised platforms, with scattered schist stones that suggest some disturbance had previously occurred. Both platforms appeared in fair condition.
Rarity or Uniqueness	**Medium**: these sites are representative of the type of hut remains that are common in the Bendigo area; however, few have been recorded in the Shepherds Creek valley.
Contextual Value	**Low-Medium:** these hut sites could not be directly linked to a known mining syndicate or period, but exist within a complex of mining sites and features and should be considered an integral part of the Shepherds Creek and wider Bendigo archaeological landscape. It is not possible to confirm at this stage if these huts relates to mining or mustering activity, or both.
Information Potential	**Medium:** Potential research questions able to be considered through archaeological investigations of these sites include: • Is it possible to confirm the purpose of this site and are there any remains of huts or other structures? • Are there any key similarities or differences between this and other hut sites that could identify the occupants? • What can this site tell us about mining or pastoral activity in the Shepherds Creek Valley?
Amenity Value	**Low.** These sites are on private land and provide limited scope for public interpretation or education due to their ephemeral nature, though material recovered from here may be suitable for public display. The sites are not visible from the nearest formed public road (Thomson Gorge Road), or from the Matakanui-Bendigo Road. The associated features are also difficult to locate without specialist knowledge or equipment (e.g. GPS, access to ArchSite data).
Cultural Associations	Pākehā

9.4.4 Archaeological Values of Site G41/787 and G41/788 (Tailings)

These sites are considered to have **low archaeological value**. This is due to the common nature of this type of feature in the landscape and the limited amenity and information value.

Table 9-24. Summary of assessment of archaeological values for site G41/787 and G41/788.

Value	Assessment
Condition	**Poor-Fair:** The sites were heavily overgrown but some mullock or tailing material was visible on the surface.
Rarity or Uniqueness	**Low:** Tailings, mullock piles and sluice faces are common in this area as well as in the wider Otago region.
Contextual Value	**Low-Medium:** Sites G41/787 and G41/788 could not be directly linked to a known mining syndicate or period, but exist within a complex of mining sites and features and should be considered an integral part of the Shepherds Creek and wider Bendigo archaeological landscape.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of these sites include: • How did the mining landscape develop over time? Are phases discernible?
Amenity Value	**Low.** These sites are on private land and provide limited scope for public interpretation or education. The sites are not visible from the nearest formed public road (Thomson Gorge Road), or from the Matakanui-Bendigo Road. The associated features are also difficult to locate without specialist knowledge or equipment (e.g. GPS, access to ArchSite data).
Cultural Associations	Pākehā

9.4.5 Archaeological Values of Site G41/789 (Sluicing)

This site is considered to have **low archaeological value**. This is due to the common nature of this type of feature in the landscape and the lack of amenity value and information potential.

Table 9-25. Summary of assessment of archaeological values for site G41/789.

Value	Assessment
Condition	**Poor-Fair:** The site was heavily overgrown but a partially intact sluice channel and sluice faces were able to be identified.
Rarity or Uniqueness	**Low:** Sluice faces are common in this area as well as in the wider Otago region.
Contextual Value	**Low-Medium:** Site G41/789 could not be directly linked to a known mining syndicate or period, but exists within a complex of mining sites and features and should be considered an integral part of the Shepherds Creek and wider Bendigo archaeological landscape.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of this site include: • How did the mining landscape develop over time? Are phases discernible?
Amenity Value	**Low.** This site is on private land and provides limited scope for public interpretation or education. The site is not visible from the nearest formed public road (Thomson Gorge Road), or from the Matakanui-Bendigo Road. The associated features are also difficult to locate without specialist knowledge or equipment (e.g. GPS).
Cultural Associations	Pākehā

9.4.6 Archaeological Values of Site G41/790 and G41/792 (Water Races)

Sites G41/790 and G41/792 are considered to hold **low archaeological value** as while they are a key component of the Bendigo mining landscape and integral to the story of this area's industrial past, it is not currently possible to link them to a known phase of occupation or time period. While sections of the races are overgrown, impacted by access roads and modern mining, large sections survive in good condition and are easily accessible from the public road.

Table 9-26. Summary of assessment of archaeological values for sites G41/790 and G41/792.

Value	Assessment
Condition	**Good**: Portions of the races are in good condition while others have been disturbed or destroyed by twentieth century track formation. The sections that pass through the project area is in fair condition, with some intact sections and some disturbed stretches
Rarity or Uniqueness	**Low**: Water races are extremely common archaeological features.
Contextual Value	**Low-Medium:** These races could not be associated with a known individual or syndicate, but do hold some contextual value as an integral feature of the historical mining landscape of the Shepherds Creek and wider Bendigo area.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of these sites include: • How were the races constructed and is there evidence of different phases?
Amenity Value	**Low**: Parts of the races are visible from the public road (Thomsons Gorge Road); however, this is not an easy landscape feature for members of the general public to identify without specialist guidance. It therefore holds limited potential for public interpretation and education.
Cultural Associations	Pākehā

9.5 Values of the Matakanui-Bendigo Road (Site G41/782)

The Matakanui-Bendigo Road was a unsuccessful turn of the twentieth century attempt to open up access to the Bendigo area from the Maniatoto, and is considered to have **low-medium archaeological value**. This is due to the common nature of this type of feature and the limited aesthetic value. The surveyed extent of this site falls outside both the Historic and Covenant area, but as road reserve is accessible and engaged with by the public, so holds low levels of heritage value.

Table 9-27. Summary of assessment of archaeological values of site G41/782.

Value	Assessment
Condition	**Good**: Several culverts and sections of revetting are in good condition. The road is currently in use as an access track for farming and mining traffic and as such the surface has been modified through use of a grader, but this activity has not damaged any known culverts or revetting.
Rarity or Uniqueness	**Low**: Pre-1900 roads are a common site type, and this example was constructed right at the end of the nineteenth century. 338 roads or tracks have been previously recorded as archaeological sites in Otago, many of which contain features comparable to those associated with this road. Many of these previously recorded roads are not described in detail but 70 feature stone revetting and/or culverts.
Contextual Value	**Low-Medium:** The road is a key component of the Thomsons Gorge landscape. It also possesses some contextual value due to its association with the development of transport infrastructure in this area.
Information Potential	**Low:** Potential research questions able to be considered through archaeological investigations of this site include: • How were the culverts and revetments constructed? • Are there similarities or differences between the culverts along this road that could inform our understanding of the development of the Matakanui-Bendigo Road?
Amenity Value	**Low-Medium.** The road is classed as road reserve and therefore is publicly accessible, and there is potential through signage to highlight the key features (stone culverts and revetments); however, the topography and locations of these features below the road make them difficult to safely access and view.
Cultural Associations	Pākehā

9.6 Archaeological Values of Potential Unrecorded Sites

The research outlined above further indicates there is a high potential for further unrecorded heritage features to be encountered, also associated with historic mining activity, historic-domestic occupation, through the project

area, as well as a low possibility of encountering sites relating to pastoral and early manawhenua activity in those areas not previously disturbed by mining.

An evaluation of the heritage values is provided for unrecorded mining sites in Table 9-28. Overall, unrecorded mining sites are considered to have **low-medium heritage value** due to the variety of possible features and ranging information potential. As identified through the historical and archaeological research, earthworks have the potential to encounter a variety of surface and/or subsurface remains. These range from tailings, prospecting pits, sluice faces, water races, and dams, as well as ancillary structural and artefactual remains associated with the mining process. While not identified during the archaeological survey, unrecorded features like these likely cut into the deposits below the topsoil. As a result, even where later mining and farming activity has occurred and archaeological features are not visible on the ground surface or aerials, there is still potential to intact remains subsurface. For features such as dams and water races, this is especially so as there is potential for these cut features to have been filled in to create level ground. Depending on the feature and its condition, some mining sites such as dams and other water management systems could have relatively high contextual values and information potential, and some historical significance. Other sites such as isolated portions of water races and sluice face would have lower values.

Table 9-28. Summary of assessment of archaeological values for unrecorded mining sites.

Value	Assessment
Condition	**Unknown:** The condition of unrecorded sites is unknown.
Rarity or Uniqueness	**Low-Medium**: The rarity of these sites will vary. Isolated water races, sluice faces, and tailings will be relatively common while dams and more substantial water management systems will be slightly rarer.
Contextual Value	**Low-High:** Isolated mining features will have low contextual values unless they are able to be associated with a known period or syndicate, while site complexes will have higher contextual values.
Information Potential	These sites have a range of information potential. More common sites like isolated water races and sluice faces will not add much to our understanding of the site. However, dams and associated water races have much higher information potential as these could inform on the construction of these larger features as well as water management in the area.
Amenity Value	**Low-Medium:** Some unrecorded mining sites may contain features or material that provide good opportunities for public interpretation or education, such as in situ features or artefacts. This will be dependent on their location (public vs private land), accessibility and condition.
Cultural Associations	Pākehā

An evaluation of the heritage values is provided for unrecorded historic-domestic sites in Table 9-29. Potential remains associated with historic-domestic sites within the project area may include structural remains associated with the buildings (i.e. remnants of stone or cob walls, chimneys, terraces, etc.) or artefact deposits. As with previously unrecorded mining features, there is potential for many of these features to survive subsurface or below vegetation. Overall, unrecorded historic-domestic sites are considered to have **low-medium heritage values** due to being relatively common within the project area. These sites have the potential to inform on the domestic lives of the miners who worked the land as well as their families.

Table 9-29. Summary of archaeological values for unrecorded historic-domestic sites.

Value	Assessment
Condition	**Unknown:** The condition of unrecorded sites is unknown.
Rarity or Uniqueness	**Low**: In the surrounds of the project area numerous hut and house sites have been recorded.

Value	Assessment
Contextual Value	**Medium-High:** Unrecorded occupation sites in this area could have high contextual values as they could be associated with the well recorded mining activities around them. They would also have contextual value to the wider area.
Information Potential	**Medium**: Potential research questions able to be considered through archaeological investigations of these huts include: • How were the miners organising their domestic space? • Are there any key similarities or differences between the site and other occupation sites that could identify their occupants? • What was life like for the miners and their families?
Amenity Value	**Low-Medium:** Some unrecorded domestic sites may contain features or material that provide good opportunities for public interpretation or education, such as in situ features or artefacts.
Cultural Associations	Pākehā

An evaluation of the heritage values is provided for unrecorded transport-communication sites in Table 9-30. Potential remains associated with this site type within the project area may include culverts, revetments or historic roading surfaces. As with previously unrecorded mining and domestic features, there is potential for many of these features to survive subsurface or below vegetation. Overall, unrecorded transport-communication sites are considered to have **low heritage value** due to being relatively common within the project area and as possessing relatively low information potential.

Table 9-30. Summary of archaeological values for unrecorded transport-communication sites.

Value	Assessment
Condition	**Unknown:** The condition of unrecorded sites is unknown.
Rarity or Uniqueness	**Low**: Transport-communication sites area extremely common site types and are well represented in the Otago archaeological record
Contextual Value	**Low-Medium:** Unrecorded transport communication sites may possess contextual value in relation to nearby mining sites or transportation routes such as the Matakanui-Bendigo Road.
Information Potential	**Low**: Potential research questions able to be considered through archaeological investigations of transport communication sites include: • How were the features constructed? • Are there similarities or differences between the features and those associated with other recorded sites of this type within the project area?
Amenity Value	**Low:** Transport-communication sites generally hold limited potential for public interpretation or education.
Cultural Associations	Pākehā

An evaluation of the heritage values is provided for unrecorded pastoral sites in Table 9-31. Potential remains associated with this site type within the project area may include fence lines, water management features or tracks. As with previously unrecorded mining and domestic features, there is potential for many of these features to survive subsurface or below vegetation. Overall, unrecorded pastoral sites are considered to have **low heritage value** due to being relatively common within the project area and as possessing relatively low information potential.

Table 9-31. Summary of assessment of archaeological values for unrecorded pastoral sites.

Value	Assessment
Condition	**Unknown:** The condition of unrecorded sites is unknown.

Value	Assessment
Rarity or Uniqueness	**Low**: Pastoral sites area common site types and are well represented in the Otago archaeological record
Contextual Value	**Low-Medium:** Unrecorded pastoral sites may possess contextual value in relation to the Morven Hills Station.
Information Potential	**Low**: Potential research questions able to be considered through archaeological investigations pastoral sites include: • How were the features constructed? • Are there similarities or differences between the features and those associated with other recorded sites of this type within the project area?
Amenity Value	**Low:** Pastoral sites generally hold limited potential for public interpretation or education.
Cultural Associations	Pākehā

There is a low risk of encountering heritage sites relating to manawhenua activity in areas of the project area not previously disturbed by mining. These sites are most likely to be in the form of midden/oven or artefact find spots, and an evaluation of their potential values is presented in Table 9-32. Overall, unrecorded Māori sites are considered to have **medium-high heritage value** due to there being no previously identified physical sites associated with manawhenua lifeways in the project area. These sites have the potential to inform on the lifeways and resource use of manawhenua.

Table 9-32. Summary of heritage values for potential Māori sites.

Value	Assessment
Condition	**Unknown:** The condition of unrecorded sites is unknown.
Rarity or Uniqueness	**High**: There have been no previously recorded sites relating to manawhenua activity in the project area, and few have been recorded in the wider area, with only two recorded within a 1km radius.
Contextual Value	**Medium-High:** Unrecorded occupation sites in this area would have high contextual values as they would be associated with the ara tawhito that passed over Thomsons Saddle and through this area, while isolated artefact finds may have slightly lower value of this kind.
Information Potential	**Medium-High**: Potential research questions able to be considered through archaeological investigations pastoral sites include: • Can they provide any chronological information for activity here? • What resources were being exploited within and moved through this landscape? • What route did the ara tawhito take following the crossing of the saddle?
Amenity Value	**Low-Medium:** Māori sites, and the material from them, may hold some potential for public display and education; however, this must be done under the direction of manawhenua and in accordance with tikaka.
Cultural Associations	Manawhenua

9.7 Summary of Heritage Values of the Project Area

The BOGP project area comprises a rich and deeply intertwined heritage landscape, parts of which have been previously acknowledged as holding high heritage values through their inclusion in the Bendigo Quartz Reefs Historic Area and/or the Bendigo Conservation Covenant area. As discussed above, NZHP agrees with previous values assessments of the Historic Area and regards the wider Covenant area's value as being comparable. Those portions of the project area that fall outside the Covenant and Historic area still hold archaeological and heritage values, thought to a lesser degree due to the fewer known heritage sites and the lower density of known activity there. NZHP has identified five key site complexes, each related through geography but also, and more importantly, through shared connections between associated individuals or mining syndicates, activity types, and reliance on the same infrastructure. As Carpenter argues, mining landscapes such as this should more accurately

be considered water management systems (Carpenter, 2012), and the binding feature in most of these site complexes is a water race or creek. A summary of these is presented in Table 9-33.

Table 9-33. Summary of heritage values of Bendigo Ophir Gold Project Area.

Site Complex	Summary	Heritage Value
McLean's Pre-emptive Rights Complex	Hut and stockyards associated with establishment of Morven Station.	Medium-High
Rise and Shine Workings	Area displaying relatively intact sequence of mining from 1860s to 1930s, linked by Rise and Shine water race.	High
Come-in-Time Workings	Area displaying moderately intact sequence of mining from 1870s to 1930s, linked by Come-in-Time water race.	High
Shepherds Creek	Valley with multiple occupation sites and evidence of small scale prospecting and mining.	Medium
Matakanui-Bendigo Road	Late nineteenth century road.	Low

10 Assessment of Effects on Archaeological and Heritage Values

Section 46 (g)(ii) of the HNZPTA requires an assessment of the effects of the proposed works, as detailed in Section 1.2, on archaeological and other values, which were assessed in the previous section. The assessment of effects takes into account the criteria established by HNZPT (2019) as outlined in Section 3. Also considered here are methods to avoid, minimise, and mitigate any adverse effects to heritage.

10.1 Effects to Archaeological Values

The proposed works will involve significant earthworks resulting in the destruction of 19 and modification of another eight archaeological sites within the footprints of each component of the mining operation (Table 10-1). The works will therefore have an overall **major impact on the archaeological values** of those sites totally removed, a **major impact on the values** of site G41/6, the Matakanui-Bendigo Road (G41/782) and water race G41/790, **minor-moderate impact** on water race G41/792, **minor impact on the values** of sites G41/251, G41/256, G41/584 and G41/586. There will be **no impact** to site G41/4 or G41/5. Of those subject to major impacts, 13 have low, one had low-medium, and eight have medium heritage value. Of those subject to minor and minor-moderate impacts, two have low, two have medium and one has medium-high heritage values. The remaining two sites with medium-high heritage values will not be impacted.

Table 10-1. Summary of effects on archaeological sites within the Bendigo-Ophir project area. Sites are colour coded to show their association to the site complexes identified by NZHP, with Mclean's pre-emptive rights area in orange, Rise and Shine in blue, Come-in-Time in green, and Shepherds Creek in grey.

Site No.	Site Name	Site Type	Archaeological Value	Summary of effects of proposed works on archaeological values
G41/4	Rabbiter's Hut	Stone Hut	**Medium-High**	**No Impact** – protection to be put in place to enable future adaptive re-use
G41/5		Stock yards	**Medium-High**	**No Impact** – is currently fenced and will be avoided during works
G41/6		Water race	**Low**	**Major impact** – removal of approximately half the site
G41/251	Come-in-Time Battery	Battery	**Medium-High**	**Minor Impact** – the majority of this sites sits outside the project area but earthworks may modify up to two heritage mine drives.
G41/256		Gold working	**Low**	**Minor Impact** – A small portion of this site will be impacted by earthworks but most will be left in situ
G41/264	Rise and Shine Creek	Gold working	**Medium**	**Major Impact** – Full removal
G41/265	Rise and Shine Creek	Stone Hut	**Medium**	**Major Impact** – Full removal
G41/266	Rise and Shine Creek	Stone Hut	**Medium**	**Major Impact** – Full removal
G41/267	Rise and Shine Creek	Stone Hut	**Medium**	**Major Impact** – Full removal
G41/269	Rise and Shine Dam	Dam	**Medium**	**Major Impact** – Full removal
G41/273		Stone hut	**Low-Medium**	**Major Impact** – Full removal
G41/277	Rise and Shine Mine and Battery	Battery	**Medium**	**Major Impact** – Full removal
G41/584	Rise and Shine Water Race	Water Race	**Medium**	**Minor Impact** – removal of approximately 250m. Most of the race sits outside the project footprint and will not be impacted
G41/586	Come-in-Time water race	Water race	**Medium**	**Minor Impact** – removal of less than 100m. Most of the site sits outside the project footprint and will not be impacted
G41/589		Revetted road	**Low**	**Major Impact** – Full removal
G41/604		Gold working	**Medium**	**Major Impact** – Full removal
G41/605		Gold working	**Medium**	**Major Impact** – Full removal
G41/606		Stone hut	**Low-Medium**	**Major Impact** – Full removal
G41/658		Hut terrace	**Low**	**Major Impact** – Full removal
G41/678		Stone hut	**Low**	**Major Impact** – Full removal
G41/782	Matakanui-Bendigo Road	Road	**Low**	**Major Impact** – 7.5km of the road will be removed but some features will remain outside of the project area. The section to be removed contains most of the known physical remains associated with this road
G41/783		Track	**Low**	**Major Impact** – Full removal
G41/784		Hut site	**Low**	**Major Impact** – Full removal
G41/785		Hut site	**Low**	**Major Impact** – Full removal
G41/786		Hut Terrace	**Low**	**Major Impact** – Full removal
G41/787		Tailings	**Low**	**Major Impact** – Full removal
G41/788		Tailings	**Low**	**Major Impact** – Full removal

Site No.	Site Name	Site Type	Archaeological Value	Summary of effects of proposed works on archaeological values
G41/789		Sluicing	**Low**	**Major Impact** – Full removal
G41/790		Water race	**Low**	**Major Impact** – Approximately 50% removed
G41/792		Water race	**Low**	**Minor-Moderate Impact** – Removal of approximately 500m

Stretches of the Rise and Shine (G41/584), Come-in-Time (G41/586) water races and as well as two others (G41/6 and G41/790) will be destroyed. The lower reaches of the Rise and Shine Water Race extend into the project area. Parts of the affected portion have been previously disturbed or destroyed by twentieth century, but the route is easily identifiable and able to be followed. The section to be removed by the proposed works forms a relatively small proportion (250m) of the total water race (over 10km long), and the best-preserved portions will not be impacted. Considering these factors, the proposed works will have a **minor** impact on the heritage values of site G41/584. Similarly small proportions of the Come-in-Time race (less than 100m of each) will be impacted, leaving the majority of the race in situ and the impact on their values as **minor**. Approximately 500m (30%) of race G41/792 will be removed, constituting a **minor-moderate** effect on this feature. Approximately half of race G41/6 and newly recorded water race G41/790 will also be removed, constituting a **major** impact on the heritage values of these features.

Approximately 7.5km of the Matakanui-Bendigo Road (G41/782) will be removed as a result of the proposed works. The recorded extent of this site stretches for just over 9km, but much of the portion outside the project area does not appear to have ever been formed. The proposed works will see the removal of nine stone culverts and four sections of revetment, and have a **major** impact of the road's heritage values.

A small portion of site G41/256 (gold workings) will be modified by the proposed works, but the majority of the site will be left in situ. The impact of the works on this site will be **minor**.

The Rise and Shine Valley was also part of an important ara tawhito that passed from the coast to the inland lakes over Thomsons Saddle. The exact route this followed once over the saddle is not known; however, most of the landforms and waterways surrounding the project area have names that long pre-date the arrival of Pākehā, meaning the region was well known to manawhenua. Most of the proposed works will focus on parts of the landscape that were heavily modified during the nineteenth century, with no risk of encountering archaeological remains of previous phases of occupation in the sluiced portions of sites G41/256, G41/264, G41/277 and G41/789. However, there is potential that ephemeral archaeological remains relating to manawhenua lifeways may be present in the areas outside the gold workings, and as such **NZHP recommends that consultation is undertaken with manawhenua to ensure appropriate procedures are in place should any Māori archaeology be encountered.**

10.2 Effects to Heritage Values

As identified in Section 9, the project area has been identified as comprising five distinct heritage site complexes with varying degrees of heritage value (Table 9-33). The proposed works include the total removal of heritage features within the **Rise and Shine workings** and **Shepherds Creek valley** and will therefore have a **major adverse impact to the heritage values** within these two areas with the exception of portions of the Rise and Shine water race that extends outside the project area. In the Come-in-Time workings, the majority of the site associated with the Come-in-Time battery will remain intact, and this forms one of the highest valued components of this site complex. Portions of the Come-in-Time race will also remain in situ. As such, the proposed works will have a **major adverse impact on the Come-in-Time workings**. Approximately 7.5km of the **Matakanui-Bendigo Road** is proposed to be removed, including almost all known heritage features. This will result in the loss of the ability of the public to travel the full length of this heritage route and will therefore have a **major impact on the heritage values of the road.** Both sites within **McLean's pre-emptive rights complex** are to be retained and protected, but the development of mine infrastructure around these features will reduce the aesthetic value of this site complex, and will therefore have a **minor-moderate impact on the heritage values**. When considered

as a whole, the proposed works will have a **major adverse impact on the heritage values of the BOGP project area.**

Part of the project area falls within the Bendigo Quartz Reefs Historic Area (List No. 9097). The proposed works will therefore have an impact on the overall heritage values of this Historic Area. The historic area has been previously assessed as possessing high aesthetic, historical and technological values in addition to the archaeological values. The proposed works will have a **moderate impact on the aesthetic values**, as these are most obvious in the areas around Bendigo where the area is prized for its "ghost town" feeling evoked by the concentration of ruined stone buildings and mining machinery and features (Bauchop, 2015), and the portion that extends into the current project area is more difficult to access and contains fewer readily visible features. The structures within the project area are mostly ruinous and at least partially obscured by topography and/or vegetation, unlike in the wider Historic Area where huts and other buildings are much more intact and mining features easily identified by the public. The historical and technological values of the area are tied directly to the representation of all forms of alluvial and quartz mining that occurred in the Bendigo area from the 1860s through to the 1930s, and the proposed works will see the loss of the most intact example (the Rise and Shine workings) of some of the earliest prospecting, sluicing and water management technologies, thus having a **moderate effect** on said values. However, given the exceptional values of the remainder of the Bendigo Quartz Reefs Historic Area, the **overall heritage values will remain high**.

Parts of the project area also fall under the Bendigo Conservation Covenant. The core objectives and relevant conditions of the Covenant with regards to heritage are outlined in Section 6.2. The proposed works within the Rise and Shine Creek area do not align with these objectives or conditions, as they will modify the landscape values as well as negatively impacting the historic values of ten sites identified by Hamel's (1993) report upon which the Covenant draws, as well as having a negative impact on the wider historic landscape. The uplift of the proposed portion of the Covenant will see the loss of the additional legal protection for 12 recorded heritage sites in addition to those impacted by the BOGP disturbance footprint (G41/259, G41/268, G41/270, G41/271, G41/272, G41/274, G41/276, G41/585, G41/588, G41/587, G41/669 G41/670); however, all will remain protected under the HNZPTA 2014. Overall, the proposed works and Covenant uplift will have a **moderate adverse effect on the heritage values of the Bendigo Conservation Covenant area,** but, as with the Historic Area**, the overall values of the Covenant will remain high.** Examples of all site types to be removed will continue to be represented by the remaining Covenant area, including the multi-sequence mining complex associated with the Alta workings (sites G41/252, G41/253, G41/254, G41/255, G41/590 and G41/671), and an impressive and unique double layer stone dam with associated dam-keeper's hut (G41/240 and G41/241).

10.3 Recommendations to Avoid, Minimise and/or Mitigate Adverse Effects

The following sections present NZHP recommendations to reduce the overall adverse effects on archaeology and heritage. They include avoidance of historic remains, as well as to ways to minimise and mitigate the adverse effects of the proposed works, including archaeological briefing, monitoring, and recording. This section outlines recommendations on how works should be undertaken so that investigations and recording can be completed in relationship to the wider works programme so that the impacts of the works can be managed accordingly.

10.3.1 Consideration of Less Adverse Options

The current project area is the result of a process of consideration of the significant natural and cultural values of the Bendigo area, with changes made to the original layout to reduce the impacts of the project. For archaeology and heritage, this has meant that mining offices, workshops, and equipment servicing infrastructure initially proposed to be located in the RAS valley have been relocated to the Shepherds Creek valley, therefore significantly reducing the number of sites affected.

Relocation of heritage sites was considered; however, none of the impacted sites are intact enough to move. Deconstructing and rebuilding the features, such as the ruined huts, elsewhere, was also considered; however, most

are ruinous to such a degree that they are not immediately recognisable to the general public as huts, and much of their heritage value comes from their setting and context within the wider mining landscape they currently inhabit. Several more intact huts in the Rise and Shine valley fall outside the project footprint and will be left intact.

10.3.2 Sites and Features to be Avoided or Protected

The project area is located in a rich heritage landscape and as such care must be taken to protect those sites in the surrounding area. Matakanui Gold has been provided with shapefiles and GPS data for all previously recorded archaeological and heritage sites in the wider area, as well as for all potential sites and features identified during the surveys undertaken by NZHP since 2017. This data will allow for the avoidance and protection of those sites close to the current project area. No earthworks will be undertaken outside of the footprint shown in Figure 1-1, and no topsoil will be stored within 10m of any previously recorded heritage site or those additional POI identified by NZHP. **All sites within 20m of the project area must have their boundaries clearly marked and annual condition inspections undertaken to ensure they remain in a stable condition**.

Potential impacts to sites within 20 metres of the project area include dust accumulation obscuring features, and vibration from mining operations or passing vehicle traffic loosening stones and causing partial or full collapse of hut walls. Underground mining is not proposed to take place below any previously identified sites not already impacted by open pits or other associated mine components. To mitigate these potential impacts, several measures have been put in place as discussed below.

A Noise and Vibration Management Plan (Marshall Day Acoustics, 2025) has been prepared to limit the overall effects of noise and vibrations of the BOGP. Section 4.1.1 of this report outlines the measures to be taken to reduce impacts of noise and vibration, and those of most relevance to heritage sites include keeping access tracks free from potholes and corrugations, ensuring vehicles are well maintained and driven in a consistent and steady manner. Blasting will be limited to set times and continual monitoring of sound and vibration levels of the operation will be undertaken by acoustic specialists.

An Air Quality Management Plan (Bluett, 2025) has been prepared to mitigate the effects of dust and other airborne contaminants. This report outlines the measures taken to monitor and reduce the impacts to the area surrounding the mine site. Of relevance to nearby heritage sites, haul roads will be regularly graded, a site-wide speed limit of 60 km/hour, reducing to 20 km/hr in any identified dust prone sections or during dry/windy weather, water will be applied to roads, topsoil and ore stockpiles, and working mine areas regularly in dry conditions, and construction of haul roads, removal of soil/rock overburden and ore or drilling/blasting will not occur when wind speeds are above 7.5m/s.

Parts of the Rise and Shine (**G41/584**) and Come-in-Time (**G41/586**) Water Races, race **G41/6** and newly recorded races **G41/790** and **G41/792**, extend outside the mine footprints, and these sections will not be affected by the proposed works. The points at which the water races enter the project area should be marked with semi-permanent timber survey pegs and damage to the races outside this area prevented during and following the proposed work. Where races have been damaged on other mining sites, a condition has been to reconstruct them; however, as the mine will be operating beyond the period of the archaeological authority, it is not possible to condition for this. To mitigate against the loss of the features within the boundaries of the project area, the full extent of the races should be mapped in so that they can be better managed into the future.

The stone hut recorded as **G41/4** ("Rabbiter's Hut") will be repurposed as part of the mine infrastructure for storage or office space. To ensure this building retains its value prior to its adaptive re-use, a 5m buffer will be established around the exterior to ensure construction works for the mine infrastructure do not damage the hut. Any modifications to the hut associated with the adaptive re-use that trigger requirements under the HNZPTA 2014 will be the subject of a separate archaeological authority application. Related site **G41/5** (stock yards) will be avoided during the works and is currently fenced off.

10.3.3 Mitigation for Information Loss

Due to the scale and nature of the required earthworks, in most cases is not possible to redesign the works to avoid archaeological remains further than the measures outlined in Section 10.3.1. To mitigate any information loss, all previously recorded archaeological sites and POI identified during this assessment must be investigated and recorded prior to their modification to determine if they and the features within them can be identified as relating to pre- or post-1900 activity.

NZHP recommends that the affected portions of the Rise and Shine (**G41/584**) and Come-in-Time (**G41/586**) Water Races be recorded to a Level II Standard as per the HNZPT (2018) guidelines prior to and during their destruction, following the procedures outlined in the archaeological management plan. Race **G41/6** and newly recorded water race **G41/790** should be recorded to a Level III standard as it holds lower contextual value and has seen more modification. The alignment of the destroyed sections should be recorded in a shapefile that will allow for future site interpretation following the end of the mine's operational life and this should be shared with local heritage organisations.

Vegetation around the stone huts (**G41/265, G41/266, G41/267, G41/273, G41/606, G41/678**), stone dam (**G41/269**), revetted road **G41/589** and the culverts and revetments associated with site **G41/782** should be first cleared by hand, and sufficient photographs taken of each structure to produce a digital 3D model using photogrammetry. Each structure should then be recorded to a Level II Standard as per the HNZPT (2018) guidelines prior to and during their destruction, following the procedures outlined in the archaeological management plan. Following the initial recording, a topsoil scrape with a hydraulic excavator should be undertaken around each structure under the supervision of an archaeologist prior to the main works commencing to identify the presence of any subsurface features or remains, and any encountered archaeology should be excavated by hand. Stone from the huts, dam, culverts and revetments should be re-used for landscaping or offered to local museums and other heritage organisations for re-purposing or display. Prior to their re-use, all stone should be kept in a secure storage location, with material from each site labelled and stored discretely to preserve the provenance.

NZHP recommends a detailed map be produced of the features within the hut/tent sites (**G41/658, G41/784, G41/785** and **G41/786**) using a GNSS to provide accurate spatial information. These sites do not contain visible structural remains and therefore do not have the same recording requirements as standing huts discussed above. All surface artefacts must be collected, and their locations recorded. Sufficient photographs taken of the terraces to produce a digital 3D model using photogrammetry. A topsoil scrape using a hydraulic excavator should be undertaken under the supervision of an archaeologist prior to the main works commencing to identify the presence of any subsurface features or remains, and any encountered in situ archaeology should be excavated by hand.

NZHP recommends a detailed map be produced of the features within the gold mining working complexes (**G41/256, G41/264, G41/277, G41/604** and **G41/605**), as well as individually recorded areas of tailings/mullock (**G41/787** and **G41/788**) and sluicing (**G41/789**), using a GNSS to provide accurate spatial information. Photographic records should also be taken of all identified features and drone surveys conducted of sites **G41/256, G41/264, G41/277, G41/604** and **G41/605** to preserve a digital record of these complexes. Any structures within the complexes must be recorded to a Level II standard as per the HNZPT (2018) guidelines. The location of all surface artefacts must be recorded and the material collected prior to earthworks taking place. The vegetation and topsoil should be cleared in stages and under supervision of an archaeologist to allow for the identification of any further features not previously recorded, as well as the identification of any subsurface features. A representative sample of the tailings/mullock heaps within site **G41/264, G41/277, G41/787** and **G41/788** should be cross-sectioned using a hydraulic excavator, as outlined in the AMP, to identify any evidence of phasing within the sites. Subsurface features must be hand excavated and recorded by an archaeologist.

NZHP recommends that topsoil stripping within the archaeological site extents be undertaken over consecutive days, prior to any other earthworks taking place. Stripping should occur around the known archaeological features and sites first, with existing access tracks used for heavy machinery until the areas of known archaeology are

cleared. Topsoil stripping should be undertaken with a hydraulic excavator using a flat edge bucket to avoid disturbance to subsurface remains and should be undertaken in systematic scrapes until natural deposits are reached. As archaeological features are exposed, they will then be excavated by hand and recorded by the archaeologist(s). Any previously unrecorded structures should be recorded to a Level II standard as per the HNZPT (2018) guidelines prior to and during their destruction to preserve as much information about these sites and features as possible.

Beyond the recorded site extents, works should operate under On-Call Protocols (OCP). Under OCP, if potential archaeological remains are encountered during works then an archaeologist should be contacted to advise further. If it is determined that the remains are archaeological or potentially archaeological, they should be recorded as described above, and archaeological monitoring should resume (with earthworks undertaken with a hydraulic excavator), until the archaeologist is satisfied that no further archaeological material survives.

NZHP recommends that the client, project manager(s), and all contractors involved in earthworks undergo an briefing outlining their requirements under the HNZPTA 2014 and RMA 1991 prior to any works commencing. The initial briefing should be done on-site, though for those unable to attend in person, the briefing can be done via videoconference (i.e., Zoom, Microsoft Teams, Skype). The briefing, delivered by the Section 45 approved person or a nominated person on their behalf, will outline the likelihood of encountering archaeological evidence, how to identify possible archaeological sites during works, the archaeological work required under the conditions of the authority, and contractors' responsibilities regarding notification of the discovery of archaeological evidence to ensure compliance with the authority conditions

NZHP recommends that work be guided by a management plan to ensure that requirements for archaeology and heritage and involvement are clearly outlined. The management plan will include areas where an archaeologist must be present and where works can proceed under the on-call protocol. The document will also provide for variation of archaeological involvement. Methods to protect sites and features are also discussed, as are procedures for recording and monitoring, protocols for the discovery of Māori archaeology and kōiwi tangata, and on-call protocols for the unexpected discovery of archaeology. Any changes to the management plan will require prior written agreement of HNZPT.

10.3.4 Investment in Other Heritage Sites

MGL has agreed to undertake several activities to improve access to and preserve heritage sites outside the project area as a way of offsetting the impacts to heritage caused by the BOGP. These include funding of DOC heritage projects to offset the uplift of part of the Bendigo Conservation Covenant, chemically killing the invasive willows along Clearwater Creek to the southwest of the Come-in-Time battery site (G41/251), funding the restoration of a damaged retaining wall within site G41/251, and establishment of an alternative walking route to the Come-in-Time battery. The invasive willows along Clearwater Creek severely hampered access to this area as part of the 2018 survey undertaken by NZHP, resulting in at least six previously recorded sites being unable to be relocated. These sites do not fall within the current project area and therefore will not be affected by the proposed works; however, the willows are likely to be causing damage to many of these sites through root disturbance. Using chemical measures to kill these trees will limit further damage to these sites and allow for their precise locations to be identified and condition assessed. This work will be carried out in consultation with an archaeologist to avoid damaging known sites, and should it be determined that site modification needs to occur, a separate archaeological authority will be sought.

Appropriate project-based mitigation to offset the uplift of part of the Bendigo Conservation Covenant requires discussion with DOC to identify appropriate projects but must be commensurate with the impacts to the values of the Covenant area as outlined in previous sections. As a first principle, suitable projects should include sites, areas or landscapes that contain similar features and site complexes proposed for removal as part of the BOGP. These include areas displaying mid to late-nineteenth century ground sluicing technology such as sluice faces, tailing and mullock deposits, miner's residences and water management systems such as water races and reservoirs.

Funding should also be focused on sites that are more easily accessible to the public than those in the Rise and Shine valley, and sites in the local landscape are preferable to those further afield so that visitors can view examples of the different mining technologies and methods used in the Bendigo area without having to travel long distances.

MGL will also be funding and assisting with the stabilisation of a stone retaining wall associated with the refurbished Come-in-Time battery (G41/251). This work will be undertaken alongside the Otago Goldfields Heritage Trust and will be subject to a separate archaeological authority and necessary approval from DOC if required.

The proposed BOGP works will result in the current main access track to the Come-in-Time battery being cut off. At present, the track begins on Thomsons Gorge Road and heads down the valley to the battery site. MGL will invest in improving an access route that follows Clearwater Creek from the west, passing through the Bendigo Reserve. This route has been planned to avoid impacting known heritage sites. Interpretation panels are also proposed to be installed along the path to provide visitors with a better understanding of the heritage landscape. Placement and installation of these signs will be undertaken under the supervision of an archaeologist to avoid impacts to heritage sites.

10.3.5 Post-Investigation Analysis, Interpretation and Reporting

Following the completion of the archaeological and heritage site recording, one report should be produced that includes all periods of heritage to satisfy the conditions of both the HNZPTA 2014 and the RMA 1993. All pre-1900 artefacts collected during the works must be analysed as outlined in the archaeological management plan and full results and interpretation of this analysis included in the final report. NZHP recommends that a Resource Consent includes a condition requiring all periods of heritage to be included in the final report and any twentieth century artefacts should be retained and made available for analysis.

Following the completion of the archaeological investigations, any artefacts should be offered to Cromwell Museum. Digital 3D models of the huts, hut sites, culverts, revetments and dams, as well as detailed maps of the other sites, should also be provided to the museum and/or made publicly available. Spatial information regarding sites recorded across the project area in the form of a shapefile should also be made available. This will ensure that a digital record of the landscape survives and is able to be experienced by members of the public without the associated hazards of allowing them into an area of active mining. Following the completion of mining in the area there is also the potential for this digital information to be incorporated into on-site interpretation, allowing visitors to understand the various phases of landscape transformation in the Rise and Shine and surrounding valleys. The paths of the water races G41/584 and G41/586 should be sympathetically marked on the landscape to bridge the gap in these features created by the proposed works following the end of mining activity.

10.4 Summary of Effects on Heritage Values

The proposed works will have an overall **major** impact on the heritage and archaeological values of the project area, seeing an almost total loss of heritage values within the footprint of the mining operation. In addition, the works will have a **moderate** impact on the heritage values of the Bendigo Quartz Reefs Historic Area and a **moderate** impact on the Bendigo Conservation Covenant area heritage values. However, the areas of highest heritage values of both the Bendigo Covenant area and the Bendigo Quartz Reef Historic Area fall outside the BOGP footprint and will not be impacted by the proposed works. Comparable examples of all sites affected by the proposed works can be found elsewhere in the Bendigo Covenant area, the Bendigo Quartz Reef Historic Area and nearby historic reserves, and are generally better maintained, more accessible and visited more regularly by the public than those proposed for removal. NZHP supports the proposed modifications to sites within the project area on the condition that the mitigative measures described above are undertaken to preserve a detailed digital record of the landscape that can be used for future public interpretation.

11 Conclusions and Recommendations

This archaeological and heritage assessment has identified five distinct but interconnected heritage complexes within the BOGP disturbance footprint (McLean's pre-emptive rights complex, the Rise and Shine workings, Come-in-Time workings, Shepherds Creek valley and the Matakanui-Bendigo Road). These site complexes comprise 17 previously recorded and twelve new heritage sites, and all but two sites will be modified by the proposed BOGP (Table 11-1). There is further potential for the works to encounter additional unrecorded sites relating to the occupation and use of the project area by manawhenua, pastoralists, and gold miners. Part of the project area falls within the Bendigo Quartz Reefs Historic Area and another partially overlapping portion is covered by the Bendigo Conservation Covenant in recognition of the Rise and Shine Valley's high archaeological and heritage values. The proposed works will have a major impact on the values of the project area and a moderate impact on the values of the Bendigo Quartz Reefs Historic Area and the Bendigo Conservation Covenant area. However, areas of highest heritage values of both the Bendigo Covenant area and the Bendigo Quartz Reef Historic Area fall outside the BOGP footprint and will not be impacted by the proposed works. Comparable examples of all sites affected by the proposed works can be found elsewhere in the Bendigo Covenant area and the Bendigo Quartz Reef Historic Area, and are generally better maintained, more accessible and visited more regularly by the public than those proposed for removal.

On the basis of this assessment, NZHP makes the following recommendations for an application to **uplift part of the Bendigo Conservation Covenant**:

3. Mitigation for partial uplift of the Covenant must be commensurate with the impact to the values identified in this assessment, and should be project based.
    a. Appropriate projects should be agreed upon between MGL and DOC.
4. All sites within the uplifted area but outside the BOGP disturbance footprint must be protected during the life of the mine.
    a. Provisions for protection of these sites are outlined in the Archaeological and Heritage Management Plan (AHMP).

NZHP makes the following recommendations for an **archaeological authority under the HNZPTA 2014**:

13. **Authority Application:** As the proposed works described in Section 1.2 will affect the sites summarised in Table 11-1, an archaeological authority under Section 44 of the HNZPTA 2014 must be obtained from HNZPT prior to any modification of the sites.
    a. If development plans are altered from those reviewed for this assessment then HNZPT and NZHP must be alerted, as any changes may alter the assessment of effects or invalidate the authority.

14. **Protection of sites/features:** As a first principle, every practical effort must be made to avoid damage to any heritage site, whether known, or discovered during any redevelopment of the site.
    a. Site G41/4 (Rabbiter's Hut) must be protected during works and any modifications for its future adaptive re-use may require a separate archaeological authority.
    b. No works will take place within the fenced boundary around site G41/5.
    c. No earthworks are to take place outside the project area as shown in Figure 1-1 and no topsoil or other overburden is to be stored within 10m of any previously recorded heritage site or those additional POI identified by NZHP.
    d. The points at which the Rise and Shine race (G41/584), Come-in-Time race (G41/586), race G41/6 and newly recorded G41/790 water race enter the project area must be marked by semi-permanent timber survey pegs and avoided.

15. **Management Plan**: All works must be carried out in accordance with the archaeological and heritage management plan (AHMP). Any amendments to the management plan will require prior written approval from HNZPT and CODC.

16. **Contractor Briefing:** All contractors working on the project must be briefed by the s45 approved person (or person nominated on their behalf) on the possibility of encountering archaeological evidence, how to identify possible archaeological sites/features during works, the archaeological work required by the conditions of the authority, and contractors' responsibilities with regard to notification of the discovery of archaeological evidence to ensure that the authority conditions are complied with.

17. **Recording of Water Races:** The affected portions of the Rise and Shine (G41/584) and Come-in-Time (G41/586) water races are to be recorded to a Level II standard as defined in HNZPT's guide, *Investigation and Recording of Buildings and Standing Structures* (HNZPT, 2018), and the full extent of each race digitally mapped. Affected portions of water races G41/6 and G41/790 are to be recorded to a Level III standard. Details of the recommended recording are provided in the AMP.

18. **Recording of Stone Huts and Dams:** The stone huts (G41/265, G41/266, G41/267, G41/273 and G41/606) and dam (G41/269) are to be recorded to a Level II standard as defined in HNZPT's guide, *Investigation and Recording of Buildings and Standing Structures* (HNZPT, 2018). Details of the recommended recording are provided in the AMP.

19. **Recording of Stone Culverts and Revetments:** The stone culverts and revetments (G41/589 and G41/782) are to be recorded to a Level II standard as defined in HNZPT's guide, *Investigation and Recording of Buildings and Standing Structures* (HNZPT, 2018). Details of the recommended recording are provided in the AMP.

20. **Archaeological Monitoring:** All earthworks that may affect an archaeological site must be monitored by the s45 approved person (or person nominated on their behalf) in accordance with the management plan.
    a. An archaeologist must monitor all earthworks within recorded archaeological sites until virgin ground is encountered.
    b. Any archaeological features and material encountered shall be recorded, analysed, and interpreted in accordance with current archaeological practice and as outlined in the management plan.
    c. Works outside the extent of recorded sites can proceed under On-Call Protocols.

21. **Archaeology of Māori origin:** If archaeological material of Māori origin is discovered at any stage, all work must stop within 20m of the find. NZHP will assist the authority holder in contacting all relevant parties including takata whenua via Aukaha and HNZPT and in accordance with the AMP.
    a. Any taoka tūturu are *prima facie* the property of the Crown who will be notified of the find. Taoka tūturu will be registered with the Ministry for Culture and Heritage. NZHP, in collaboration with manawhenua, shall notify the Ministry of Culture Heritage and establish the most appropriate temporary storage, management and care for taoka tūturu, until such time as traditional or actual ownership is determined, with an appropriate institution or kaitiaki.

22. **Kōiwi (human remains):** Should kōiwi be encountered, all work must stop within 20m of the find. NZHP will assist the authority holder in contacting all affected parties as soon as practicable, including takata whenua via Aukaha, HNZPT, and the police. The Ngāi Tahu policy for kōiwi takata shall also be followed (Te Rūnanga o Ngāi Tahu, 2019).

23. **Public Outreach:** The results of the archaeological investigations, including reports, photographic records of the features and sites, and any digital 3D models should be made available to the public via the Cromwell Museum.

24. **Reporting:**

a. Within 20 working days of the completion of on-site archaeological work, the site record forms must be updated or submitted to ArchSite.
b. Within 12 months of the completion of on-site archaeological work, a final report on any archaeological material that is found must be prepared in accordance with *ASG12 Archaeological Report Guideline* (HNZPT, 2023) and submitted to HNZPT for inclusion in the digital library, to Cromwell Museum and the NZAA Central Filekeeper.

In addition, NZHP recommends that the following conditions be included in a **Resource Consent under the RMA 1991**:

7. **Recording of Twentieth Century Heritage:** Features within sites identified in this report that post-date 1900 should be recorded following the procedures outlined for comparable archaeological sites and features described above. The results of these investigations should be included in the same report as the archaeological results.

8. **Management Plan**: All works must be carried out in accordance with the archaeological and heritage management plan (AHMP). Any amendments to the management plan will require prior written approval from HNZPT and CODC.

9. **Reporting:** MGL must ensure the final report on the heritage investigations is made publicly available.

10. **Artefacts:** All archaeological and twentieth century artefacts collected during the proposed works should be retained and offered to the Cromwell Museum.

11. **Re-use of materials**: Stone from the stone huts, dam, culverts and revetments should be repurposed for landscaping or other purposes where it will be visible to future visitors to the project area or offered to Cromwell Museum or other local heritage organisations for re-use. Prior to their re-use, all stone should be kept in a secure storage location, with material from each site stored discretely to preserve the provenance.

12. **Post-Mining Interpretation:** As part of the remediation plans following the end of the mine's life, the results of the heritage site recording should be used to inform interpretive signage within publicly accessible areas of the project area:
    a. The paths of water races G41/584 and G41/586 should be marked on the landscape through trail posts or interactive signage at the entry and exit points of the races to the mining footprint.

Table 11-1. Summary of effects on heritage sites within the proposed Bendigo-Ophir Gold Project area. Sites are colour coded to show their association to the site complexes identified by NZHP, with Mclean's pre-emptive rights area in orange, Rise and Shine in blue, Come-in-Time in green, and Shepherds Creek in grey.

Historical Background					Heritage and Archaeological Protection		Assessment of Effects on Archaeological Values		Assessment of Effects on Archaeology	
Arch Site	Site Name	Site Type	Date Range	Known Associations	Heritage Protection Status	HNZPT Act 2014	Significance	Magnitude of Impact	Effect on Structure(s)	Effect on Subsurface Archaeology
G41/4	Rabbiter's Hut	Pastoral/ agricultural	c.1860s	Morven Hills Station	-	Yes	Medium-High	No Impact	N/A	N/A
G41/5		Pastoral/ agricultural	c.1860s	Morven Hills Station	-	Yes	Medium-High	No Impact	N/A	N/A
G41/6		Mining-gold	Pre-1900	-	-	Yes	Low	Major	Partial removal	Partial removal
G41/251	Come-in-Time Battery	Mining-gold	1880s-1930s	Come-in-Time and Alta Syndicates, David Betts	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area (outside of current project area)	Yes	Medium-High	Minor	N/A	Partial removal
G41/256		Mining-gold	Pre-1900	-	Bendigo Conservation Covenant	Yes	Low	Minor	N/A	Partial removal
G41/264	Rise and Shine Gold Workings	Mining-gold	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	N/A	Full removal
G41/265		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/266		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/267		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/269	Rise and Shine Dam	Mining-gold	1870s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Major	Full removal	Full removal
G41/273		Historic-domestic	Potentially Pre-1900	-	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Potentially	Low	Major	Full removal	Full removal
G41/277	Rise and Shine Mine and Battery	Mining-gold	1870s-1940s	Rise and Shine, Eureka, Jubilee, Bendigo Rise and Shine, and Shine Again Syndicates	Bendigo Conservation Covenant	Yes	Medium	Major	N/A	Full removal
G41/584	Rise and Shine Water Race	Mining-gold	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Medium	Minor	Partial removal	Partial removal
G41/586	Come-in-Time Water Race	Mining-gold	1870s-1900s	Come-in-Time Syndicate	Bendigo Conservation Covenant	Yes	Medium	Minor	Partial removal	Partial removal
G41/589		Transport-communication	Potentially Pre-1900	-	Bendigo Conservation Covenant	Potentially	Low	Major	Full removal	Full removal
G41/604		Mining-gold	Potentially 1880s-1910s	Alta Syndicate, potentially Come-in-Time syndicate	Bendigo Conservation Covenant	Yes	Medium	Major	N/A	Full removal
G41/605		Mining-gold	Potentially 1880s-1910s	Alta Syndicate, potentially Come-in-Time syndicate	Bendigo Conservation Covenant	Yes	Medium	Major	N/A	Full removal
G41/606		Historic-domestic	Potentially Pre-1900	-	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Potentially	Low	Major	Full removal	Full removal
G41/658		Historic-domestic	1860s-1890s	Rise and Shine Syndicate	Bendigo Conservation Covenant, Bendigo Quartz Reefs Historic Area	Yes	Low-Medium	Major	Full removal	Full removal
G41/678		Historic-domestic	Potentially Pre-1900		-	Potentially	Low	Major	Full removal	Full removal
G41/782	Matakanui-Bendigo Road	Transport-communication	1898+	-	-	Yes	Low	Major	Partial removal	Full removal
G41/783		Transport-communication	Unknown	-	-	Potentially	Low	Major	N/A	Full removal
G41/784		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Minor	N/A	Partial removal
G41/785		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/786		Historic-domestic	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/787		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/788		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/789		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	N/A	Full removal
G41/790		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Major	Partial removal	Partial removal
G41/792		Mining-gold	Potentially Pre-1900	-	-	Potentially	Low	Minor-moderate	Partial removal	Partial removal

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Appendix A Land Parcels in the Project Area

Table A-1. Affected land parcels and landowners within the BOGP area.

Appellation	Covenant or Reserve status	Landowner
Section 11 SO 24641	Bendigo Conservation Covenant	Bendigo Station Limited (Leaseholder)
Section 12 SO 24641	Bendigo Conservation Covenant	Bendigo Station Limited (Leaseholder)
Section 14 SO 24641	Bendigo Conservation Covenant	Bendigo Station Limited
Section 15 SO 24641	Bendigo Conservation Covenant	Bendigo Station Limited (Leaseholder)
Section 16 SO 24641	Bendigo Conservation Covenant	Bendigo Station Limited (Leaseholder)
Section 18 SO 24641	Bendigo Conservation Covenant	Bruce D S Jolly, Linda M Jolly (Leaseholder)
Lot 4 DP 525495		Bendigo Station Limited (Leaseholder)
Lot 5 DP 517385		Bendigo Station Limited
Lot 6 DP 517385		Bendigo Station Limited
Part Lot 10 DP 391334		Bendigo Station Limited
Lot 2 DP 316124		Bendigo Station Limited
Lot 1 DP 525588		Bruce D S Jolly, Linda M Jolly
Lot 11 DP 525588		Bruce D S Jolly, Linda M Jolly
Lot 2 DP 505064		Bruce D S Jolly, Linda M Jolly (Leaseholder)
Lot 1 DP 505064		Tarras Farm Limited Partnership
Lot 1 DP 509332		Tarras Farm Limited Partnership
Lot 5 DP 548903		Prunus Orchards Limited
Section 10 SO 554095		Prunus Orchards Limited
Lot 14 DP 548903		Prunus Orchards Limited
Section 1 Block IX Lauder SD		Nicola J Milne, Ralph G Milne (Leaseholder)
RUN 238N		Matakanui Station Limited (Leaseholder)
Section 3 SO 435480	Road Reserve	CODC
Section 1 SO 401685	Historic Reserve	Crown Land
Section 1 SO 24604	Conservation Reserve	Crown Land
Section 1 SO 300797	Road Reserve	CODC
Section 3 SO 300797	Road Reserve	CODC
Section 4 SO 300797	Road Reserve	CODC
Section 5 SO 300797	Road Reserve	CODC
Lot 17 DP 548903	Road Reserve	CODC
Section 21 SO 554095	Road Reserve	CODC
Section 22 SO 554095	Road Reserve	CODC
Section 5 SO 554095	Road Reserve	CODC
Thomson Gorge Road Reserve	Road Reserve	CODC
Matakanui-Bendigo Road Reserve	Road Reserve	CODC
Matilda Rise Road Reserve	Road Reserve	CODC

Appendix B Site Record Forms

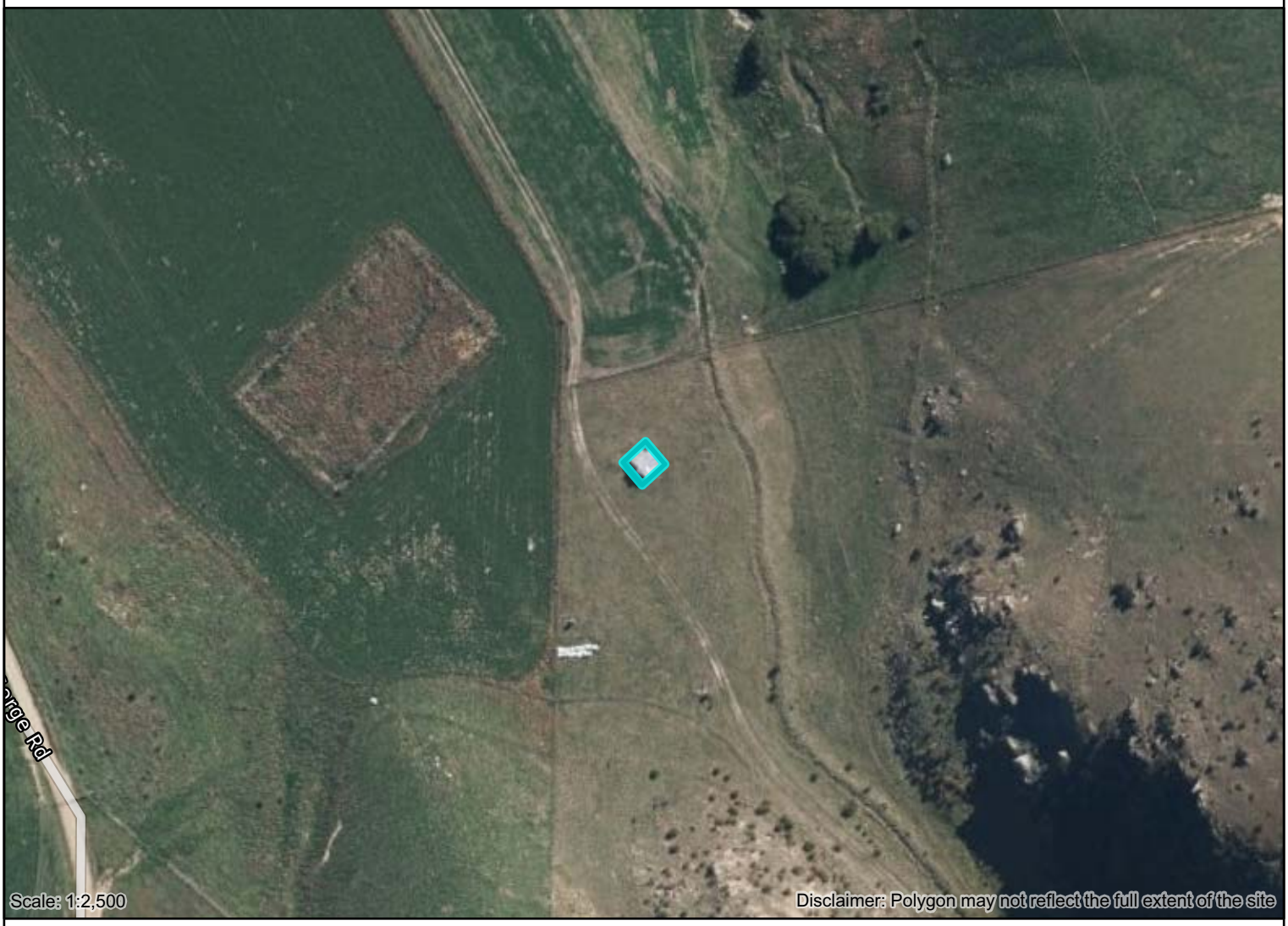
List of site record forms attached for sites that will be affected by the proposed works.

NZAA Site Id	Site Name	Brief Description
G41/4	Rabbiter's Hut	Stone Hut
G41/5		Stone stockyards
G41/6		Water Race
G41/251	Come-in-Time Battery	Come-in-Time battery – 10-stamper battery, two adits, mullock, track, wall, and possible ore bin
G41/256		Gold workings
G41/264	Rise and Shine Creek	Gold workings, water race, dam, adit, breastwork, tailings, terrace and sluice faces
G41/265	Rise and Shine Creek	Stone hut
G41/266	Rise and Shine Creek	Stone hut
G41/267	Rise and Shine Creek	Stone hut with chimney
G41/269	Rise and Shine Dam	Dam 10 m wide
G41/273		Stone hut
G41/277	Rise and Shine Mine and Battery	Rise and Shine mine and battery – Mine and battery site, adits, sluicing face, spoil, machine foundations, dam, stone faced terrace (possible dam)
G41/584	Rise and Shine Water Race	Water race
G41/586	Come-in-Time Water Race	Water race
G41/589		Revetted road
G41/604		Turbine and battery
G41/605		Mine
G41/606		Stone hut
G41/658		Hut terrace
G41/678		Stone hut
G41/782	Matakanui-Bendigo Road	Road
G41/783		Track
G41/784		Hut Terrace
G41/785		Hut site
G41/786		Hut site
G41/787		Tailings
G41/788		Tailings
G41/789		Sluicing
G41/790		Water race
G41/792		Water race

Site Record Form

ARCHSITE archaeological site recording scheme

NZAA Site Number:	G41/4	**Site Coordinates (NZTM)**	
Imperial Site Number:	S124/44	**Easting:**	1315455
Site Type:	Historic - domestic	**Northing:**	5019381
Site Name(s):	Rabbiter's Hut	**Source:**	Shapefile



Finding Aids to the Location of the Site:

Next to G4/5 stone sheep yards

Brief Description:

Hut constructed of split schist, corrugated iron roof

Condition of Site when last visited:

Good

Site Periods:

Colonial 1840-1900

Ethnicity:

Non Maori

Site Features:

Building - hut

Associated Sites:

G41/5

Description:

Updated 27/02/2025 (Field Visit), submitted by: NZHP_NaomiWoods_ArchSite, visited 04/12/2024 by Woods, Naomi

Site G41/4 is known to locals as Rabbiter's Hut, though it was originally built as a shepherd's cottage in the mid-nineteenth century, and first appears in an 1866 pre-emptive rights plan. This hut was visited in 2024 and has been modified since it was last described by Hamel (1993- "Rich Fields of Bendigo"). Though we do not have previous photographs of this hut, the footprint can be seen to have been extended when compared with Hamel's sketch plan, with a corrugated iron lean-to added on the south elevation. The glazing has been replaced as well as potentially the roof, the chimney brought down to roof level, and a modern flue installed. These modifications have altered heritage fabric; however, they have preserved the hut as a functioning building, one that is still in use by farm staff today.

Condition Notes:

Updated 27/02/2025 (Field Visit), submitted by: NZHP_NaomiWoods_ArchSite, visited 04/12/2024 by Woods, Naomi

Has been extended and modified but remains in good condition and is still in use.

Images for Site G41/4

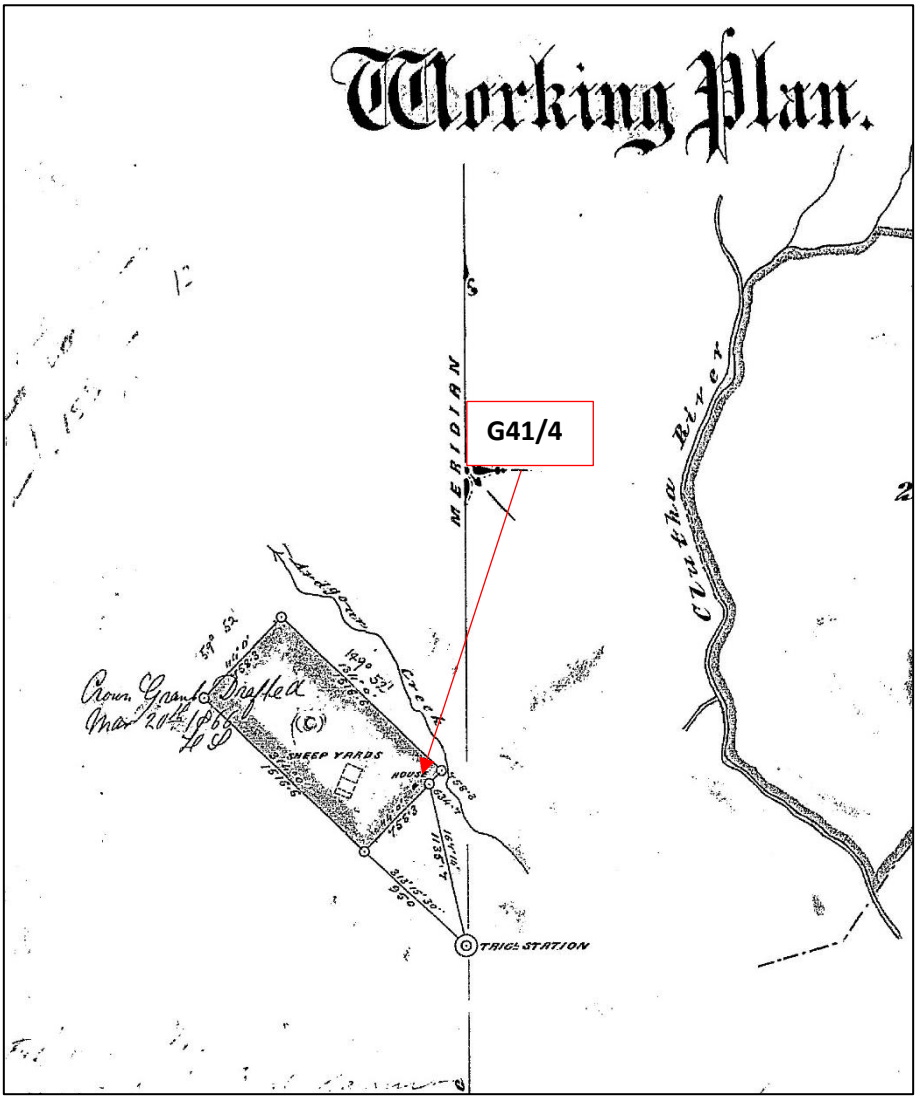


Figure 1. **Detail of SO 16291, showing area of John Mclean's pre-emptive right and associated structures. Note: Shepherds Creek is labelled as Ardgour Creek in this plan.**

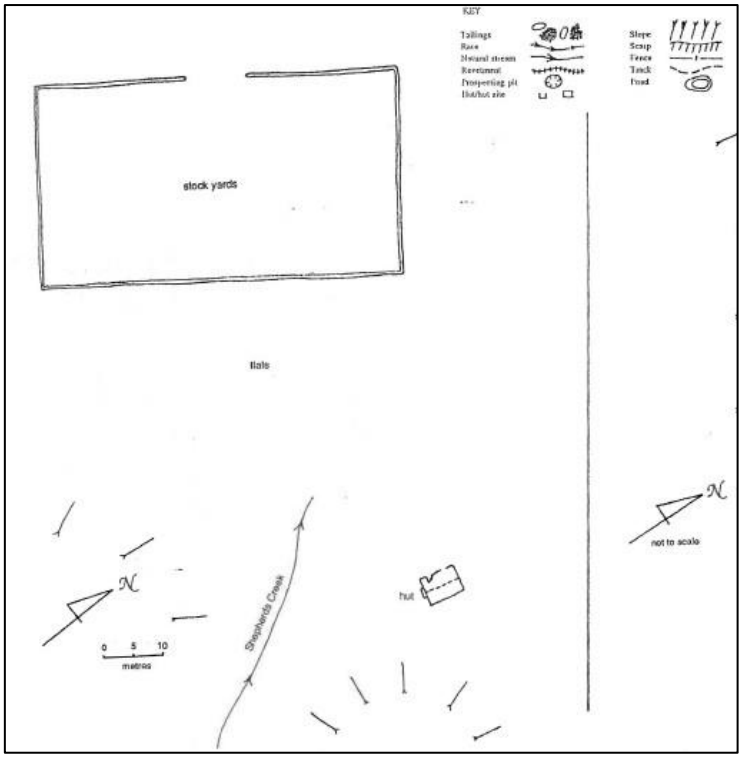


Figure 2. **Sketch map of G41/4 (bottom centre) in context with G41/5 stock yards (Hamel, 1993).**

Figure 3. Site G41/4 in 2024, looking east.

Figure 4. Site G41/4 in 2024, looking north.

ES BE AC AA AA HP

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM

Map number S124
Map name Cardrona
Map edition 1st
Grid Reference 183854

SITE NUMBER S124/44

SITE NAME: MAORI / OTHER

SITE TYPE Stone hut

1. Aids to relocation of site E318300 N385400

From Ardgour Rd take road to Thompsons Gorge up Shepherds Creek. Hut marked on S124.

2. State of site; possibility of damage or destruction

Very good.

3. Description of site *(NOTE: This section is to be completed ONLY if no separate Site Description Form is to be be prepared.)*

Split schist and concrete mortar and corrugated iron roof. Chimney on S.end. Hut was a shepherds cottage on Morven Hills station and is c.100 years old.

4. Owner Mr.A.S.Jolly
Address Ardgour Station
R.D.3
Cromwell

Attitude co-operative

Tenant/Manager
Address

Attitude

5. Methods and equipment used

Photographs taken: Yes/No (Describe on Photograph Record Form)
Date recorded 24.11.77

6. Aerial photograph or mosaic No.

Site shows:
Clearly/badly/not at all

7. Reported by M.Newman and P.Croad
Address MWD
Cromwell

Date 26.11.77

Filekeeper G. S. PARK

Date ~~15 FEB 1978~~ 15 FEB 1978

Site Record Form

ARCHSITE archaeological site recording scheme

NZAA Site Number:	G41/251	**Site Coordinates (NZTM)**	
Imperial Site Number:	S124/380	**Easting:**	1316750
Site Type:	Mining - gold	**Northing:**	5017894
Site Name(s):	Come-in-Time Battery	**Source:**	Shapefile

Finding Aids to the Location of the Site:

Road crosses un-named tributary of Clearwater. Main Red Mine adit is located above the battery. Second adit c. 30 m east of first.

Brief Description:

Mining battery (10-stamper) with features including two adits, mullock, track, wall, incline, possible ore bin. The machine was possibly made up of two smaller ones. Battery is approx. 4.5m high with foundations 3.5x4.25m.

Condition of Site when last visited:

Good

Site Periods:

Colonial 1840-1900

Ethnicity:

Non Maori

Site Features:

Adit, Mullock heap, Stamper battery, Track, Water race

Associated Sites:

Description:

Updated 25/01/2019 (Field visit), submitted by meganlawrence , visited 18/12/2018 by Lewis, Julia; Scrivener, Phoebe; Lawrence, Megan; Jasmine Weston
Grid reference (E1316750 / N5017894)

This site records the Come in Time battery and surrounding features which were in use between 1880 and the early 1900s. The site exists today as cumulatively described in earlier site record form updates and Hamel's (1993) plans of the site, except some of the revetted schist walls of the pathways have collapsed. Site revisited as part of archaeological survey of Thomsons Gorge area.

Updated: 17/09/2013 - Refer also to: 'Middlemiss, Anita. November 2011. Report to complete archaeological authority 2006/54: Restoration works, Come-in-Time battery, Rise and Shine Creek'. Updated by: Molloy, Nicola.

Condition Notes:

Updated 25/01/2019 (Field visit), submitted by meganlawrence , visited 18/12/2018 by Lewis, Julia; Scrivener, Phoebe; Lawrence, Megan; Jasmine Weston

Overgrown in grass and shrub. Some sections of the schist revetments of the pathways have collapsed.

One of the 3 camshaft bearings is missing as is the large A frame bearing support structure. The battery itself is almost intact. Other features such as walling are in good condition. Refer to DOC - being upgraded, authority 2006/54 recently issued.

Additional Information for Site G41/251

Figure 1 Photograph looking southeast at the Come in Time Battery recorded as G41/251. Photograph taken by Megan Lawrence on 18/12/18.

Figure 2 Photograph looking north at the main adit of the Red Mine recorded as part of G41/251. Photograph taken by Megan Lawrence on 18/12/18.

Figure 3 Photograph looking northeast at platform above the battery recorded as G41/251. Photograph taken by Megan Lawrence on 18/12/18.

Figure 4 Photograph looking southwest at the schist channelling at the end of the Come in Time water race recorded as part of G41/251. Photograph taken by Megan Lawrence on 18/12/18.

Figure 5 Photograph looking north at the partially collapsed stone revetment recorded as part of G41/251. Photograph taken by Megan Lawrence on 18/12/18.

Figure 6 Approximate extent of the Come in Time battery recorded as G41/251 showing the Come in Time race head southeast towards the Rise and Shine mine and battery (G41/277). Approximate site extent based on recorded archaeological features, pedestrian survey, aerial photographs and LiDAR Data.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS260)

NZMS 260 map number
NZMS 260 map name
NZMS 260 map edition

NZAA METRIC SITE NUMBER G41/251
DATE VISITED 30 July 2010
SITE TYPE Mining - Gold
SITE NAME: MAORI
OTHER Come-in-Time Battery, Rise and Shine Creek

Grid Reference NZTM Easting 1316750 Northing 5017894

1. Aids to relocation of site *(attach a sketch map)*

A Department of Conservation track is marked and signed from Thomson Gorge Road, approximately 9km from the intersection with SH8.

2. State of site and possible future damage

Restoration works were undertaken on the battery (2005) and adjacent stone wall (2010) in recent times and the site remains in good condition.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Battery
Remedial works undertaken on the battery are described in *"Come in time battery, remedial work specification"* Peter Mason, 2001, Unpublished report for Department of Conservation, Central Otago Area Office. Plans 1-7 within the document itemise the components replaced and are attached to this updated site record form. Works were funded by the Otago Goldfields Heritage Trust (OHGT)and undertaken by John Symons Ltd.

Rotten timber components removed from the battery are stored onsite on the northern side of the stonewall that surrounds the battery.

Cultural material excavated during the works are recorded in the report for NZHPT authority report 2006/54.

The original pelton wheel has been lost from the site. A pelton wheel, on long term loan to OGHT, was installed within the original pelton wheel foundation to enable people to better appreciate how the battery site worked. The replacement pelton wheel was donated by Lex McLean, Alexandra. Its origin was in the Upper Nevis Valley where it was used to power an electricity generator on the McLean Claim.

Rebuilt section of wall
A 4.5 metre long section of dry stone wall north of the pelton wheel foundations was rebuilt because it had collapsed. Works were undertaken by Keith Hinds (stonemason), Otago Goldfield Trust volunteers and Department of Conservation staff.

4. Owner The Crown
Address

Tenant/Manager Department of Conservation
Address Central Otago Area Office
PO Box 176
ALEXANDRA 9340

5. Nature of information *(hearsay, brief or extended visit, etc.)* Site visit, Department of Conservation records

Photographs *(reference numbers and where they are held)* Photographs taken and held by Department of Conservation
Aerial photographs *(reference numbers and clarity of site)*

6. Reported by Anita Middlemiss
Programme Manager - Visitor/Historic Assets
Address Department of Conservation
Central Otago Area Office

Filekeeper
Date

7. Key words

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

Latitude S	Longitude E
⌊⌊⌊ Type of site	⌊⌊⌊ Present condition & future danger of destruction
⌊⌊⌊ Local environment today	⌊⌊⌊ Security code
⌊⌊⌊ Land classification	⌊⌊⌊ Local body

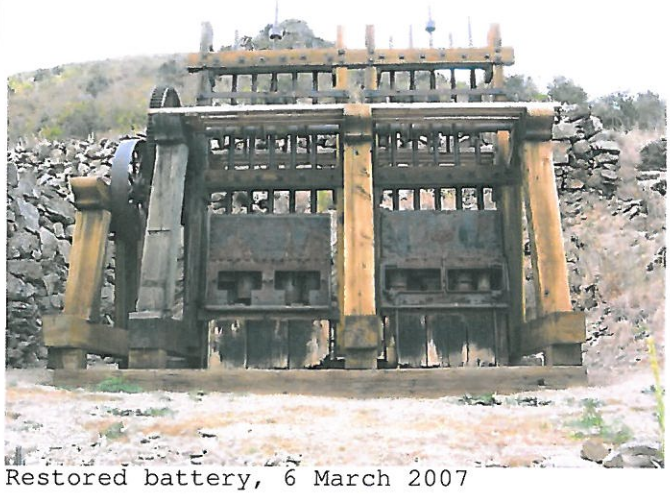
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION

NZMS 260 map number
NZMS 260 map name
NZMS 260 map edition

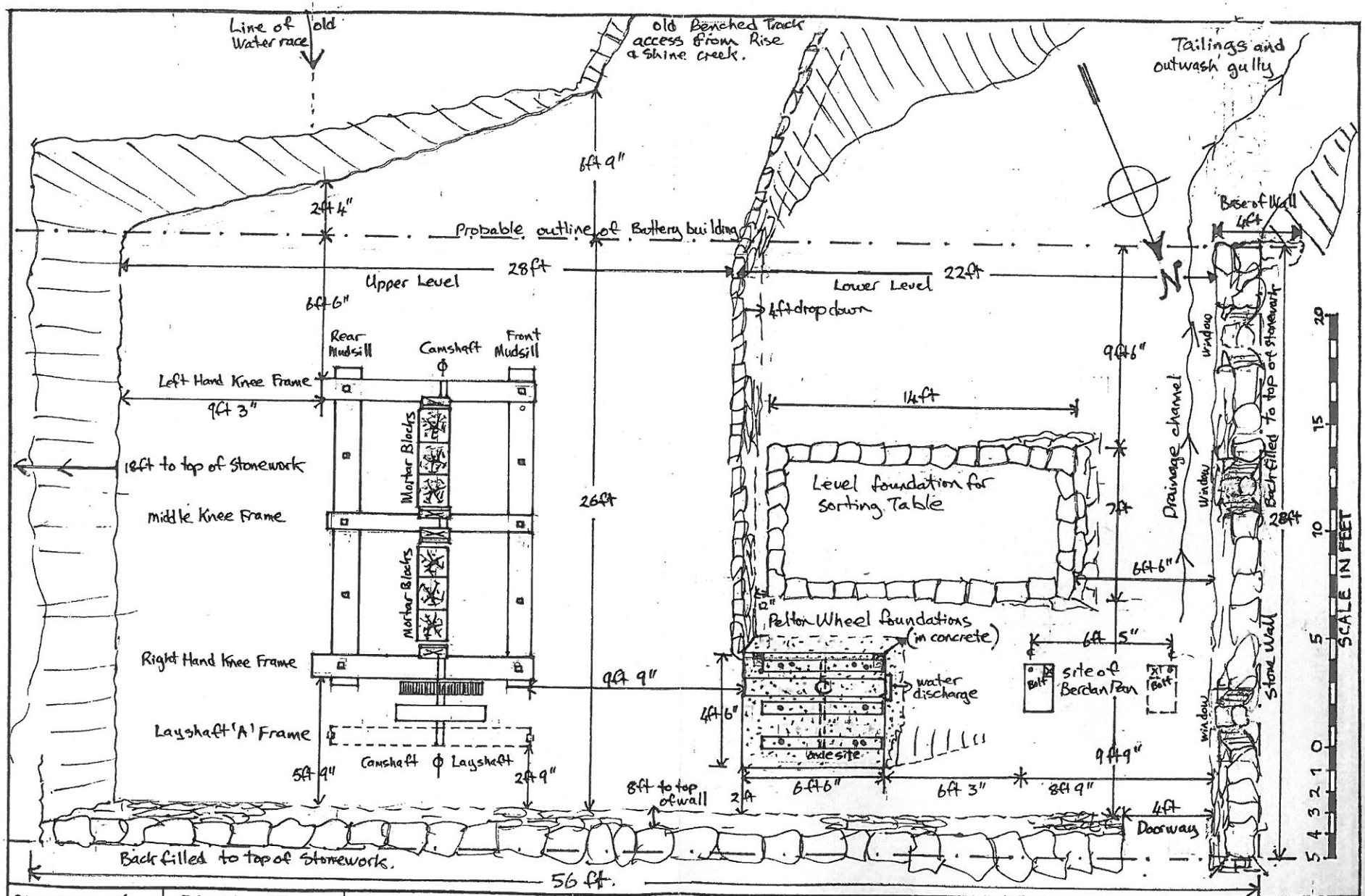
NZAA METRIC SITE NUMBER G41/251
DATE VISITED 30 July 2010
SITE TYPE Mining - gold
SITE NAME: MAORI
OTHER Come-in-time battery

Battery site 6 June 2005 before restoration



Restored battery, 6 March 2007

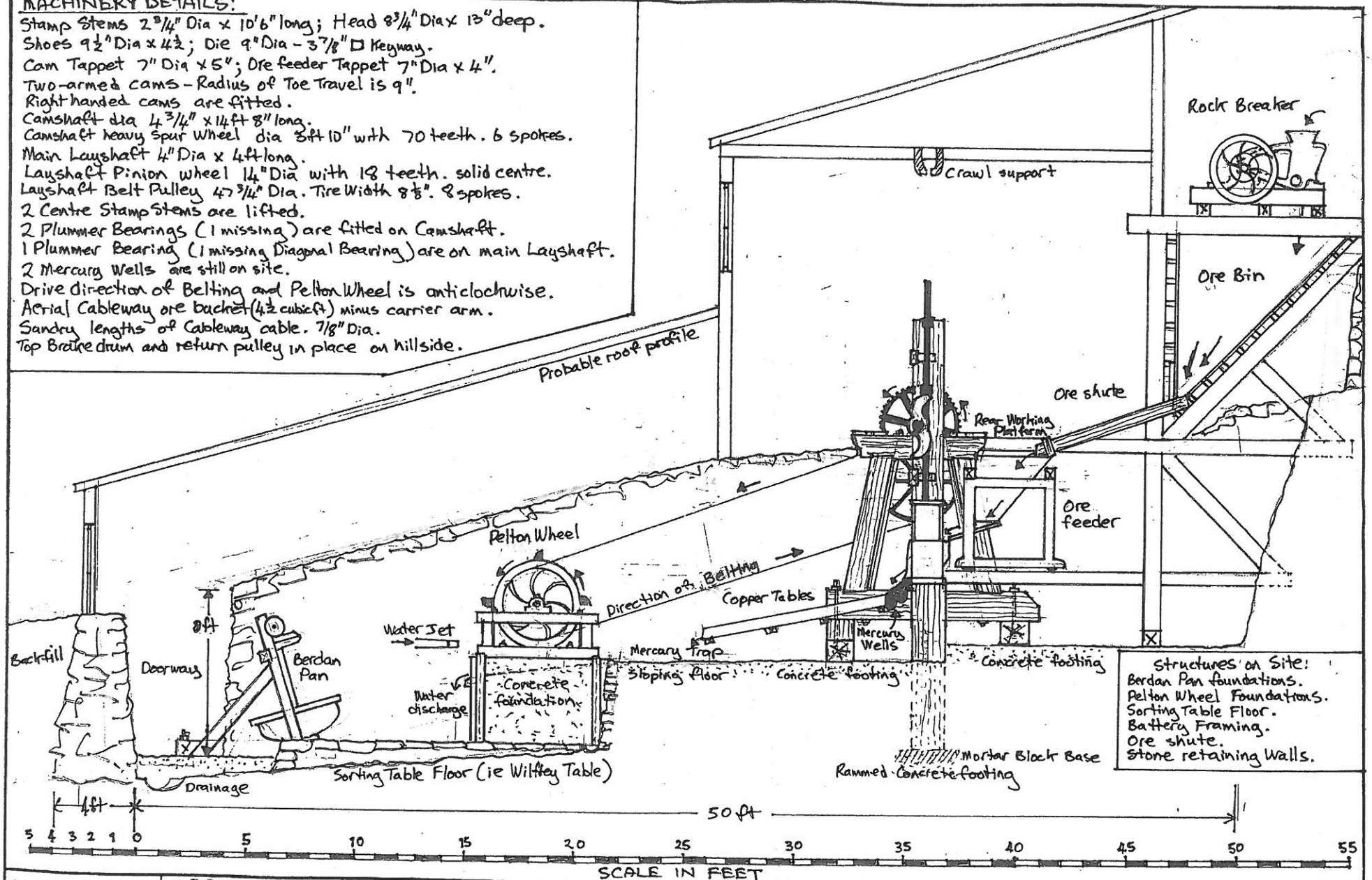
Rebuilt section of wall indicated by red arrow and borrowed pelton wheel, 30 July 2010



PLAN No: 1	PLAN OF SITE	COME IN TIME BATTERY – RISE & SHINE CREEK BENDIGO	PJM ENTERPRISES LTD.	DATE DRAWN 11/5/2001
SCALE: ¼" to 1 foot				SIGNED PA Thomson

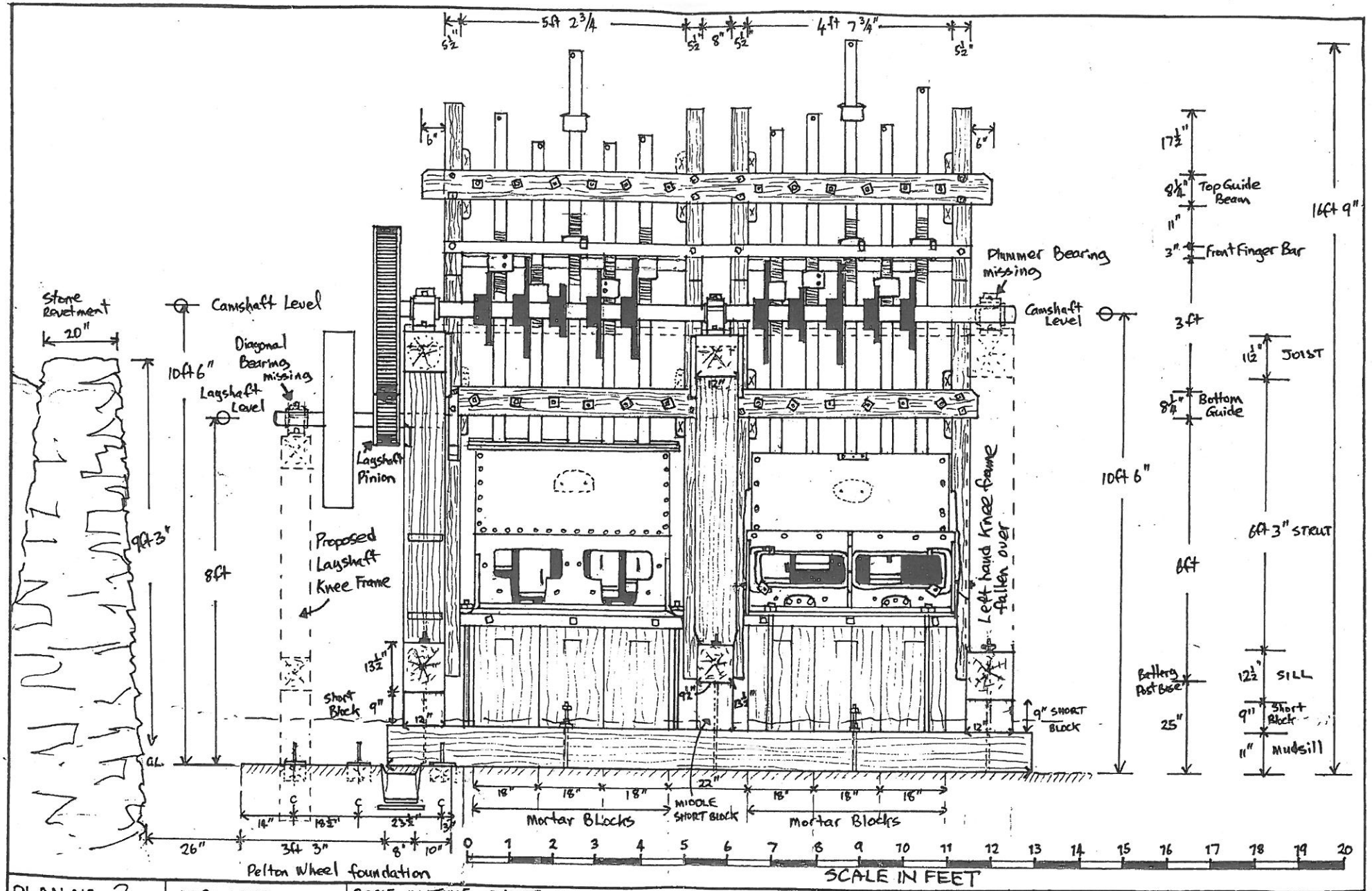
MACHINERY DETAILS:

Stamp Stems 2 3/4" Dia x 10'6" long; Head 8 3/4" Dia x 13" deep.
Shoes 9 1/2" Dia x 4 1/2"; Die 9" Dia - 3 7/8" □ Keyway.
Cam Tappet 7" Dia x 5"; Ore feeder Tappet 7" Dia x 4".
Two-armed cams - Radius of Toe Travel is 9".
Right handed cams are fitted.
Camshaft dia 4 3/4" x 14ft 8" long.
Camshaft heavy Spur Wheel dia 8ft 10" with 70 teeth. 6 spokes.
Main Layshaft 4" Dia x 4ft long.
Layshaft Pinion wheel 14" Dia with 18 teeth. solid centre.
Layshaft Belt Pulley 47 3/4" Dia. Tire Width 8 1/8". 8 spokes.
2 Centre Stamp Stems are lifted.
2 Plummer Bearings (1 missing) are fitted on Camshaft.
1 Plummer Bearing (1 missing Diagonal Bearing) are on main Layshaft.
2 Mercury Wells are still on site.
Drive direction of Belting and Pelton Wheel is anticlockwise.
Aerial Cableway ore bucket (4 1/2 cubic ft) minus carrier arm.
Sandry lengths of Cableway cable. 7/8" Dia.
Top Brake drum and return pulley in place on hillside.

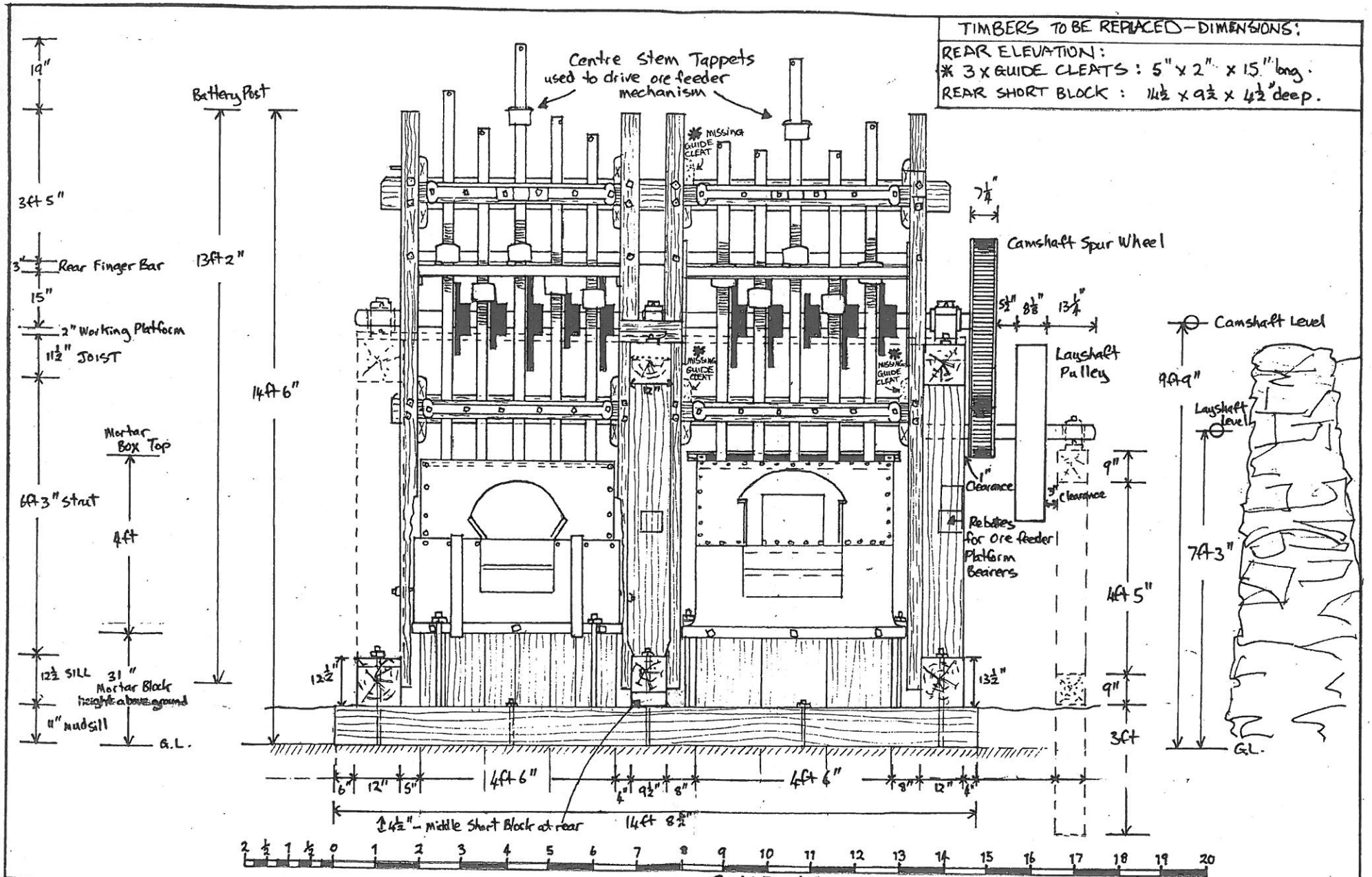


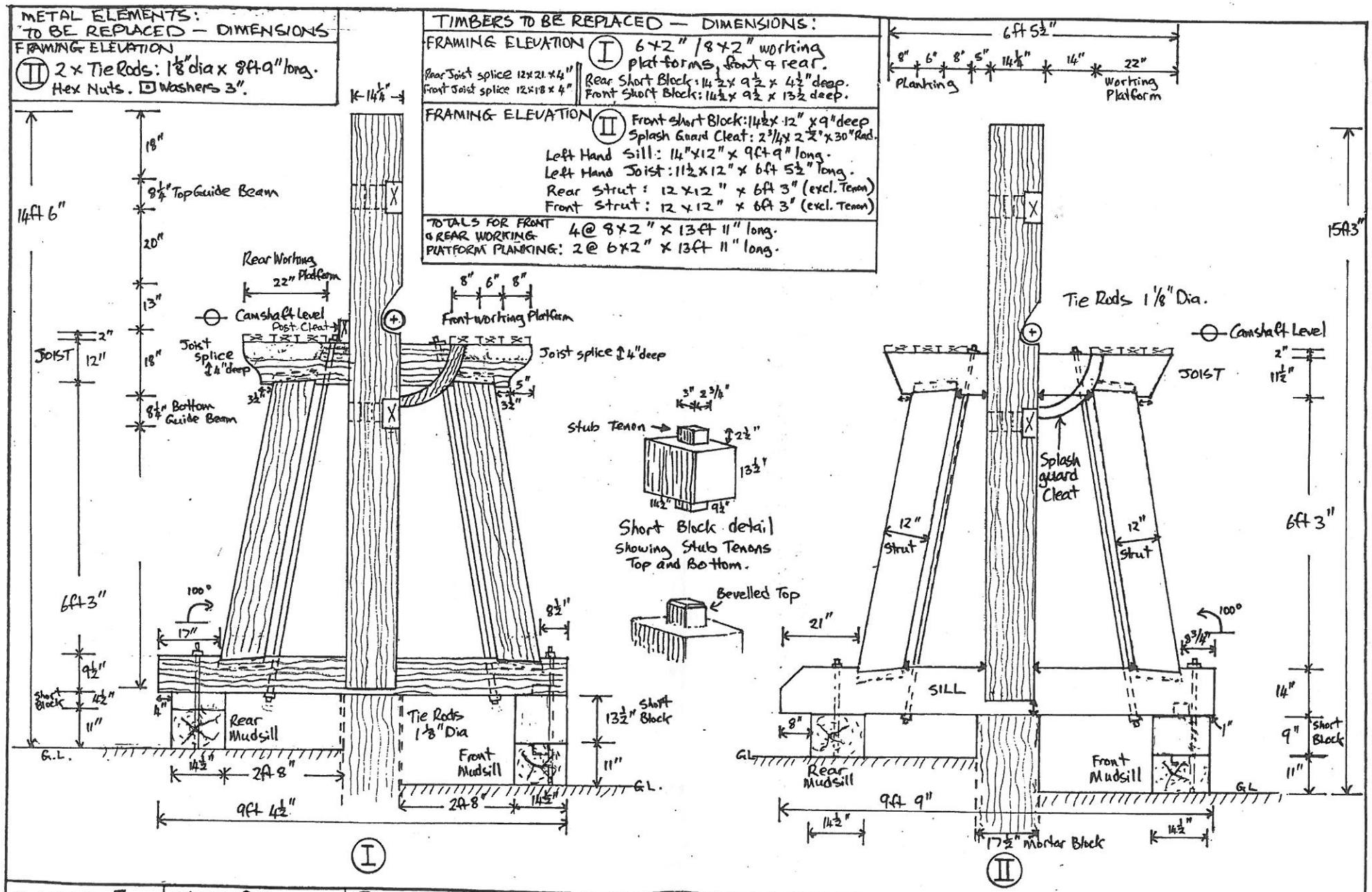
Structures on Site:
Berdan Pan foundations.
Pelton Wheel Foundations.
Sorting Table Floor.
Battery Framing.
Ore shute.
Stone retaining Walls.

PLAN Nº 2	CROSS SECTION	COME IN TIME BATTERY - RISE & SHINE CREEK - BENDIGO	JM ENTERPRISES LTD.	DATE DRAWN 11/5/2001
SCALE: 1/4" to 1 foot	OF SITE	ILLUSTRATING PROBABLE PROCESSING ORE TRAIN INSIDE THE BATTERY		SIGNED: P J Mason



PLAN No: 3	FRONT ELEVATION	COME IN TIME BATTERY - RISE & SHINE CREEK - BENDIGO, CENTRAL OTAGO.	PJM ENTERPRISES LTD.	DATE DRAWN 21/5/2001
SCALE: ½" to 1 foot				SIGNED: P.J. Mason


TIMBERS TO BE REPLACED – DIMENSIONS:
REAR ELEVATION:
* 3 x GUIDE CLEATS : 5" x 2" x 15" long.
REAR SHORT BLOCK : 14½ x 9½ x 4½" deep.
Centre Stem Tappets used to drive ore feeder mechanism
Battery Post
19"
3ft 5"
3" Rear Finger Bar
15"
2" Working Platform
11½" JOIST
6ft 3" strut
Mortar Box Top
4ft
12½ SILL
31" Mortar Block height above ground
11" Mudsill
G.L.
13ft 2"
14ft 6"
* missing GUIDE CLEAT
MISSING GUIDE CLEAT
12"
7¼"
Camshaft Spur Wheel
5½" 8½" 13¼"
Layshaft Pulley
1" Clearance
3" Clearance
Rebates for ore feeder Platform Bearers
12½"
13½"
9"
4ft 5"
9"
3ft
Camshaft Level
9ft 9"
Layshaft level
7ft 3"
G.L.
6" 12" 5" 4ft 6" ¼" 9½" 8" 4ft 6" 8" 12" ¼"
↕4½" – middle Short Block at rear
14ft 8½"
2 ½ 1 ½ 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
SCALE IN FEET
PLAN No: 4
SCALE: ½" to 1 foot
REAR ELEVATION
COME IN TIME BATTERY – RISE & SHINE CREEK – BENDIGO.
PJM ENTERPRISES LTD.
DATE DRAWN 21/5/2000
SIGNED: P A Mason



PLAN No: 5	BATTERY FRAMING ELEVATIONS	I MIDDLE KNEE FRAME	II LEFT HAND KNEE FRAME	PJM ENTERPRISES LTD.	DATE DRAWN 22/5/2001
SCALE: ½" to 1 foot		COME IN TIME BATTERY – RISE & SHINE CREEK – BENDIGO			SIGNED: P J Mason

METAL ELEMENTS:
TO BE REPLACED — DIMENSIONS

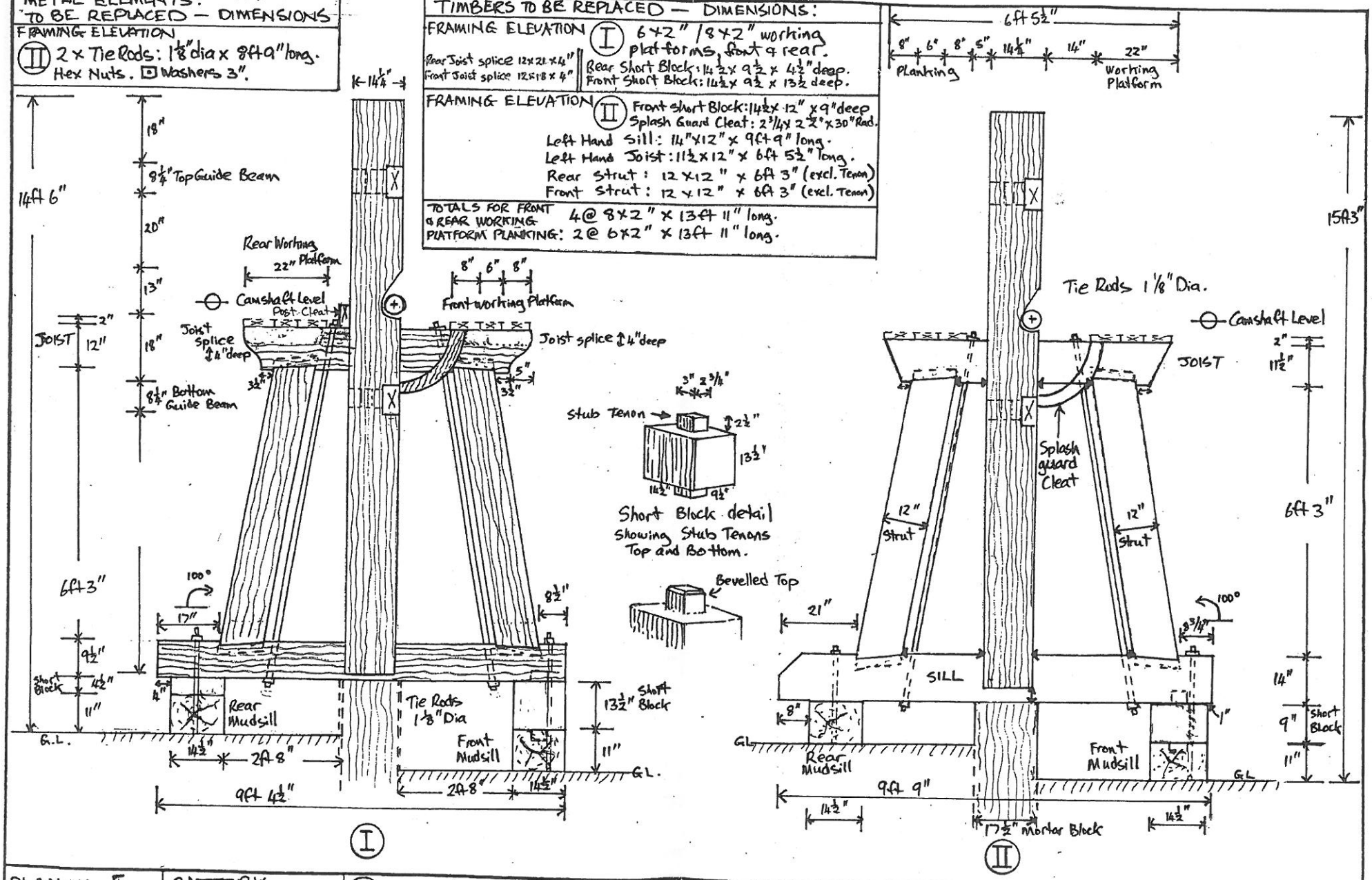
FRAMING ELEVATION
(II) 2 x Tie Rods: 1⅛" dia x 8ft 9" long.
Hex Nuts. ▣ Washers 3".

TIMBERS TO BE REPLACED — DIMENSIONS:

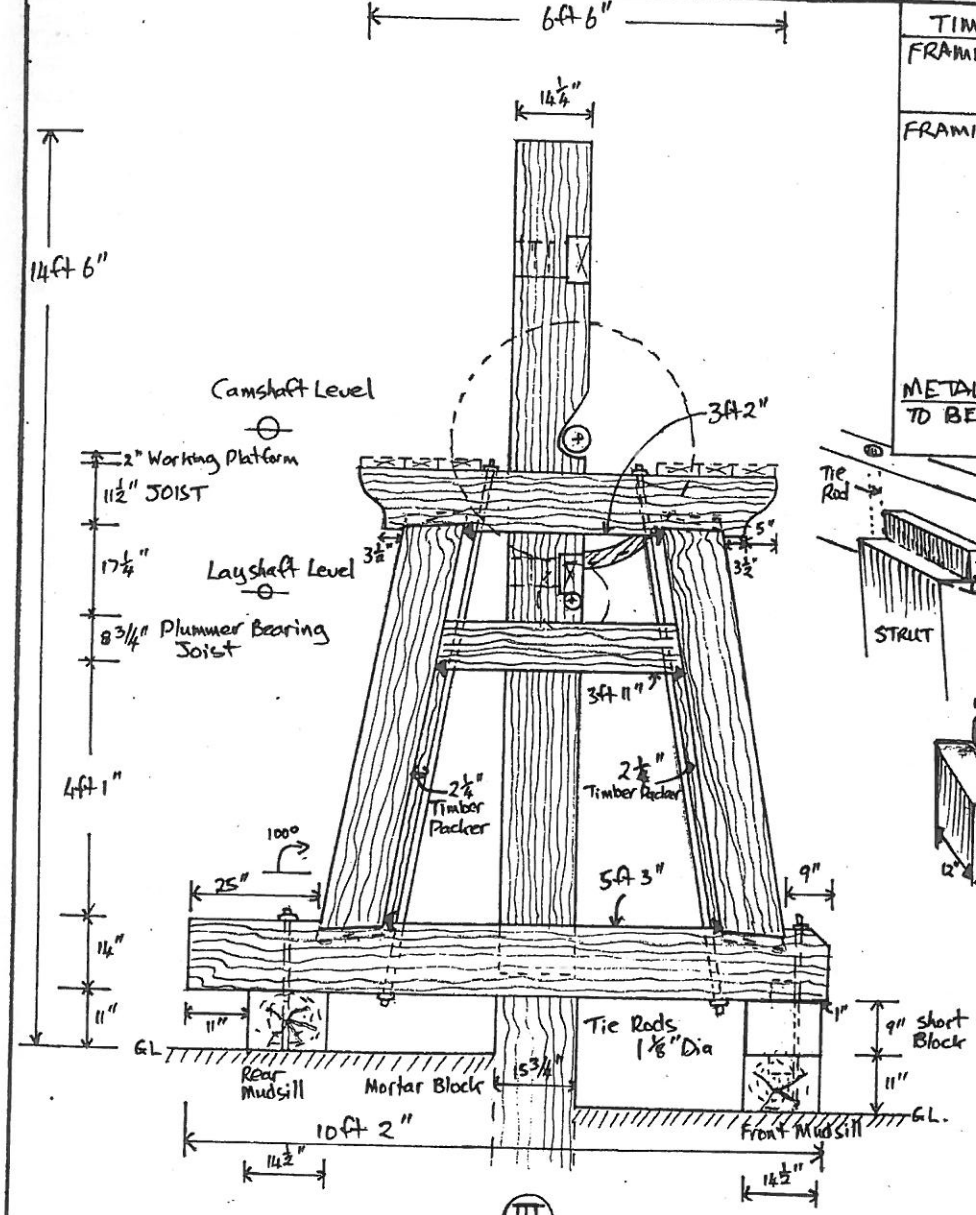
FRAMING ELEVATION (I) 6x2" / 8x2" working platforms, front & rear.
Rear Joist splice 12x2½x4"
Front Joist splice 12x1⅝x4"
Rear Short Block: 14½ x 9½ x 4½" deep.
Front Short Block: 14½ x 9½ x 13½ deep.

FRAMING ELEVATION (II) Front short Block: 14½ x 12" x 9" deep
Splash Guard Cleat: 2¾ x 2½" x 30" Rad.
Left Hand Sill: 14" x 12" x 9ft 9" long.
Left Hand Joist: 11½ x 12" x 6ft 5½" long.
Rear Strut: 12 x 12" x 6ft 3" (excl. Tenon)
Front Strut: 12 x 12" x 6ft 3" (excl. Tenon)

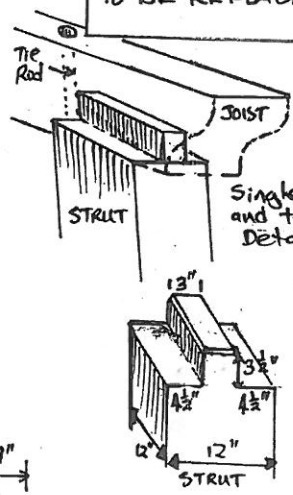
TOTALS FOR FRONT & REAR WORKING PLATFORM PLANKING: 4@ 8x2" x 13ft 11" long.
2@ 6x2" x 13ft 11" long.



PLAN No: 5	BATTERY FRAMING ELEVATIONS	(I) MIDDLE KNEE FRAME	(II) LEFT HAND KNEE FRAME	PJM ENTERPRISES LTD.	DATE DRAWN 22/5/2001
SCALE: ½" to 1 foot		COME IN TIME BATTERY — RISE & SHINE CREEK — BENDIGO			SIGNED: P J Madon



III



Single abutment and tenon joint Detail.

TIMBERS TO BE REPLACED — DIMENSIONS:

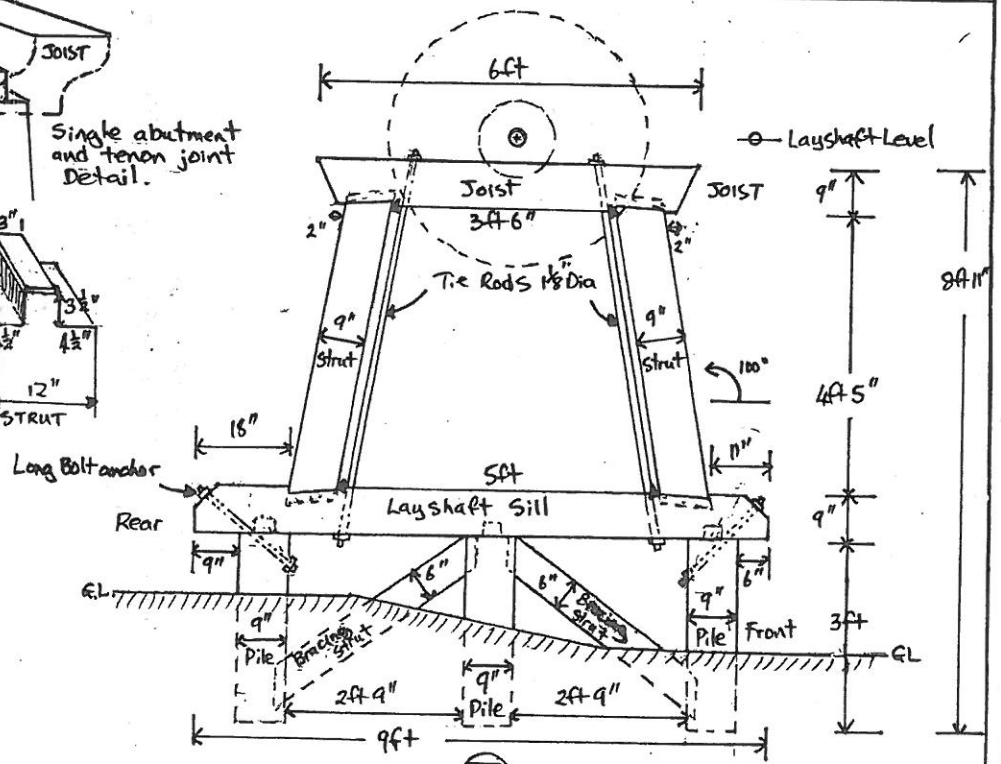
FRAMING ELEVATION (III) Front Short Block 14½ x 12" x 9" deep. (excl. Tenon)

FRAMING ELEVATION (IV)

Layshaft Joist:	9"x9" x 6ft long.
Layshaft Sill :	9"x9" x 9ft long.
Rear Strut :	9 x 9" x 4ft 5" long (excluding Tenon).
Front Strut :	9 x 9" x 4ft 5" long (excluding Tenon).
Rear Pile :	9x 9" x 3ft long (excl. Tenon).
Middle Pile :	
Front Pile :	9x 9" x 3ft long (excl. Tenon).
Rear Bracing Strut:	6 x 6" x 3ft 6" long (excl. Tenon).
Front Bracing Strut:	6 x 6" x 3ft 6" long (excl. Tenon).

METAL ELEMENTS TO BE REPLACED:

TWO Tie Rods : 1⅛"dia x 6ft 6" long. hex nuts. ◻ Washers 3".
Two Long Bolt anchors : 1"dia x 2ft long. ◻ Nuts. ◻ Washers 2½".



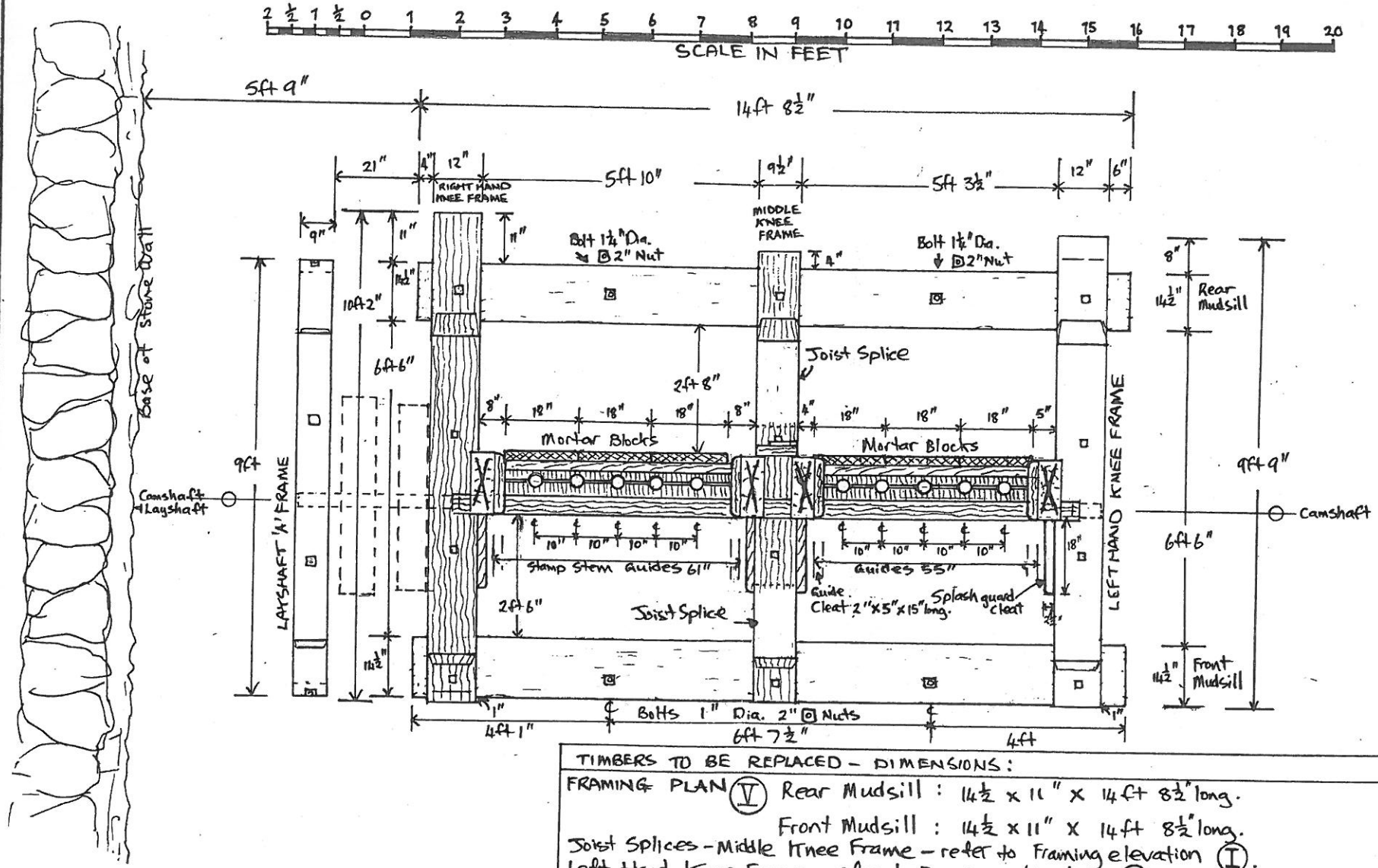
IV

PLAN No: 6	BATTERY FRAMING ELEVATIONS	(III) RIGHT HAND KNEE FRAME	(IV) LAYSHAFT 'A' FRAME (Proposed)
SCALE: ½" to 1 foot		COME IN TIME BATTERY — RISE & SHINE CREEK BENDIGO.	

PJM ENTERPRISES LTD

DATE DRAWN 22/5/2009

SIGNED: DAM



TIMBERS TO BE REPLACED – DIMENSIONS:

FRAMING PLAN (V) Rear Mudsill : 14½ x 11" x 14ft 8½" long.

Front Mudsill : 14½ x 11" x 14ft 8½" long.

Joist Splices – Middle Knee Frame – refer to Framing elevation (I).

Left Hand Knee Frame – refer to Framing elevation (II).

Front short Block – Right Hand Knee Frame – refer to Framing elevation (III).

Layshaft 'A' Frame – refer to Framing elevation (IV).

PLAN N°: 7 SCALE: ½" to 1foot	BATTERY FRAMING PLAN	(V) BATTERY FRAMING PLAN – COME IN TIME BATTERY TIMBER ELEMENTS ONLY RISE AND SHINE CREEK – BENDIGO	PJM ENTERPRISES LTD.	DATE DRAWN 23/5/2001 SIGNED: P.J. Mason

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER G41/251
DATE VISITED 3/III/2005
SITE TYPE Mining battery (Come-in-Time) etc
SITE NAME: MAORI
OTHER Come in Time battery

S124/380

Grid Ref. Easting / / / **2 6 6** / / / Northing / / / **7 9 6** / / /
G.P.S. Easting 2 2 **2 6 6 9 3** Northing 5 5 **7 9 6 1 3**

Note revised Grid Ref on basis of G.P.S. reading; this is for battery proper

2226836 5579697 Main Red Mine adit above C-in-T battery.
Adit about 60 m long and runs at 27° ; little cubby about 5 m in on right (storage for candles etc?)

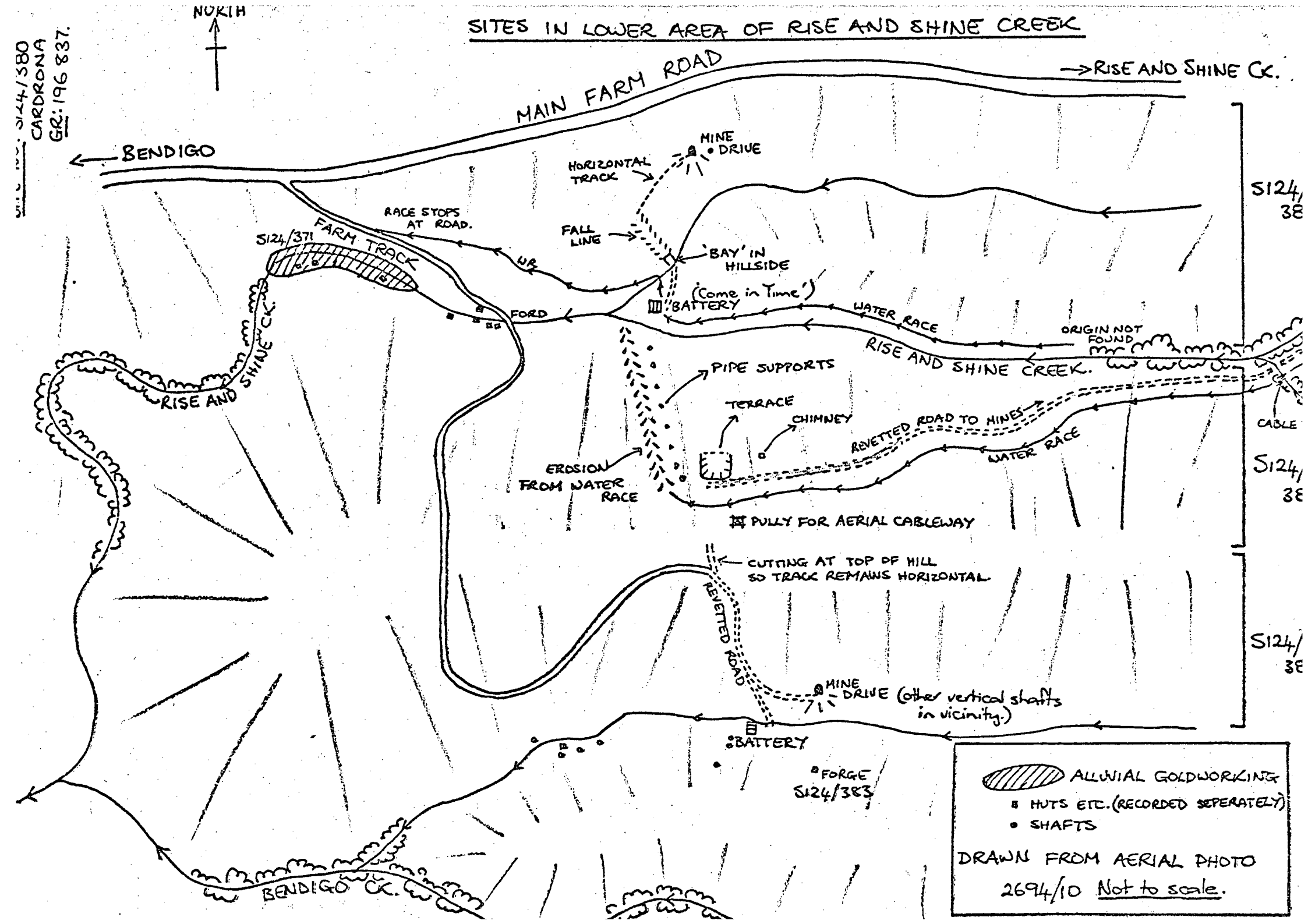
2226850 5579667 Other adit entrance.
Second adit c. 30 m east of first; 2 m wide, 7 m long, entrance 2 m high, collapsing with big rocks; mullock spilling down slope below apron for c. 30m, up to 5 m wide.

2226774 5579684 End of level tram from adit.
2226773 5579676 Timbers on line of incline
2226773 5579658 Top of possible ore bin site.
2226770 5579642 Bottom of bin site by track
Hamel (1993: 26, fig 21) suggests our possible bin site is probably the entrance to a collapsed adit.

2226705 5579595 End upper track behind battery
2226693 5579613 Come-in-Time battery. **(N.B.GPS source)**
Part of frame of ore truck located between battery and race

2226689 5579594 Creek end of terraces above battery.
2226675 5579617 Bottom end of wall opposite battery
2226616 5579630 Road crosses creek (un-named tributary of Clearwater) .
(Original may have crossed upstream)
2226515 5579732 Road to Come-in-Time leaves farm road

R. Nichol, 50 Devon St, Picton

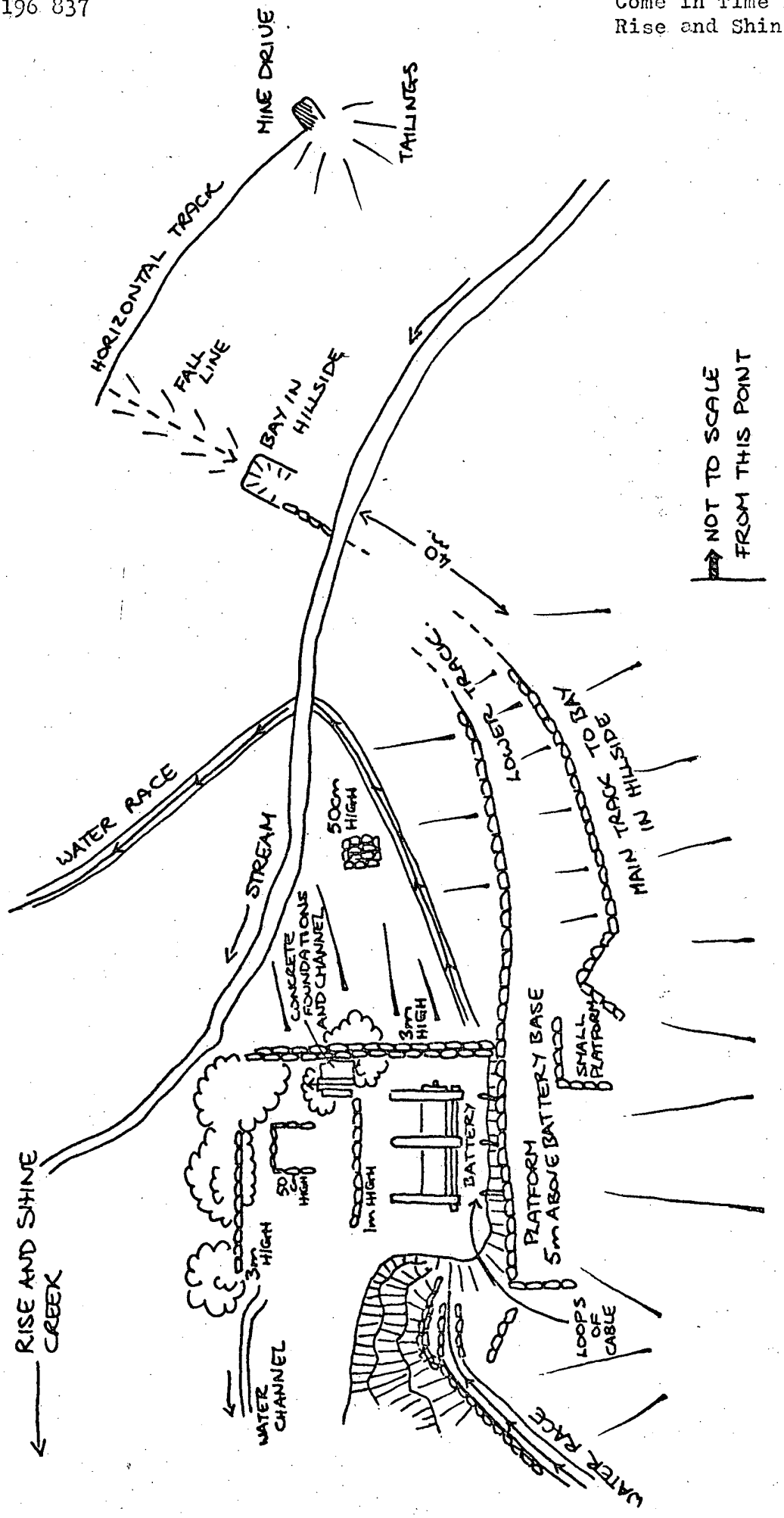

SITES IN LOWER AREA OF RISE AND SHINE CREEK
NORTH
MAIN FARM ROAD
→RISE AND SHINE Ck.
←BENDIGO
MINE
DRIVE
HORIZONTAL TRACK
FALL LINE
RACE STOPS AT ROAD.
FARM TRACK
S124/371
UR
'BAY' IN HILLSIDE
'Come in Time'
BATTERY
FORD
WATER RACE
ORIGIN NOT FOUND
RISE AND SHINE CREEK.
RISE AND SHINE Ck.
PIPE SUPPORTS
TERRACE
CHIMNEY
REVETTED ROAD TO MINES
CABLE
WATER RACE
EROSION FROM WATER RACE
PULLY FOR AERIAL CABLEWAY
CUTTING AT TOP OF HILL SO TRACK REMAINS HORIZONTAL
REVETTED ROAD
MINE
DRIVE (other vertical shafts in vicinity.)
BATTERY
FORGE
S124/383
BENDIGO Ck.
S124/38
S124/38
S124/38
ALLUVIAL GOLDWORKING
HUTS ETC. (RECORDED SEPERATELY)
SHAFTS
DRAWN FROM AERIAL PHOTO
2694/10 Not to scale.

NB3/FN41

S124
Cardrona
1st Ed. 1970
GR: 196 837

S124/380
August 1980
Mining/Battery site

Come in Time Battery
Rise and Shine Creek



NB3/FN41

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM

Map Number	S124
Map Name	Cardrona
Map Edition	1st 1970
Grid Reference	196 837

SITE NUMBER S124/380 SD

SITE NAME: MAORI Come in Time Battery
OTHER Rise and Shine Creek

SITE TYPE Mining and Battery site

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)

Two stone revetted parallel roads lead to battery from about 50m up the gully where there is a 'bay' in the hillside. This was constructed to contain material transported from the mineshaft further up the hill, see diagram. At the battery site a revetted water race from higher up Rise and Shine Creek can be traced entering and leaving the site, the middle section presumably destroyed by the placement of the battery. This race continues down the true right of the creek and is probably associated with alluvial goldworking further down.

The mineshaft noted above is situated about 80m up the gully, clearly visible from the battery site. It is a horizontal drive into the hillside passing beneath the main road. The opening is 1.5m x 1m. Associated tailings spill down the hillside. A small ammount of stone has been excavated from a site 20m upstream and on the same level as the drive.

Ore from working of the Alta Reef on the other side of Rise and Shine Creek was also conveyed to the battery site by means of an aerial cableway, see S124/381. See diagram.

Historical information; see attached sheet.
The mine drive to the north of the Come in Time Battery was known as 'The Red Mine'.

NB3/FN4

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S124
NZMS 1 map name Cardrona
NZMS 1 map edition 1st 1970

NZAA NZMS 1 SITE NUMBER S124/380 380
DATE VISITED August 1980
SITE TYPE Mining/Battery site
SITE NAME: MAORI
OTHER Come in Time Battery
Rise and Shine Creek

Grid Reference Easting 3 1 9 6 0 0 Northing 3 8 3 7 0 0

1. Aids to relocation of site *(attach a sketch map)*

Follow farm road from Bendigo towards Rise and Shine Creek. Take side road to right (leads to creek) about 1.5km before main road ford the creek. Proceed upstream on the true right, you can't miss it.

See diagram following.

2. State of site and possible future damage

Good, the battery itself is almost intact, see below. Other features such as walling etc is also in good condition.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Battery: One of the three camshaft bearings is missing as is the large 'A' frame bearing support structure. The other two such structures remain intact and are both slightly different from the smaller one. The two containers into which the ore is put for stamping are also different suggesting that the machine was made up of two smaller ones. It is a 10 stamper battery. The middle stamper of each group of five is c.0.2m longer than the others and has an extra 'weight' which shows severe evidence of having been pounded. The water supply appears to come from across the valley, via an alignment of stone supports, 500' drop. Battery is approx. 4.5m high with foundations 3.5m x 4.25m. Pulley belt wheel and secondary gear wheel both approx. 1m diameter.
The battery is enclosed on three sides by dry stone walls up to 3m high.

continued...

4. Owner
Address Bendigo Station

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 2694/10 Battery site, 'bay' in hill side and drive tailings are all clearly visible, also race.

6. Reported by C.Jacomb and S.Easdale
Address Bendigo Survey
C.V.D.
Cromwell

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words

battery mineshaft tailings water race revetted roadways

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

D M Type of site
A K Local environment today

A A Present condition and future danger of destruction
A A Security code

Site Record Form

ARCHSITE archaeological site recording scheme

NZAA Site Number:	G41/256	**Site Coordinates (NZTM)**	
Imperial Site Number:	S124/385	**Easting:**	1315556
Site Type:	Mining - gold	**Northing:**	5018680
Site Name(s):		**Source:**	CINZAS

Finding Aids to the Location of the Site:

Brief Description:
GOLDWORKINGS

Condition of Site when last visited:
No Recent Info

NEW ZEALAND ARCHEOLOGICAL ASSOCIATION INCORPORATED

Site Periods:

Ethnicity:

Site Features:

Associated Sites:

Description:

Condition Notes:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S124
NZMS 1 map name Cardrona
NZMS 1 map edition 1st 1970

NZAA NZMS 1 SITE NUMBER S124/385 385
DATE VISITED August 1980
SITE TYPE Alluvial goldworkings
SITE NAME: MAORI
OTHER

Grid Reference Easting 3 1 8 3 0 0 Northing 3 8 4 7 0 0

1. Aids to relocation of site *(attach a sketch map)*

Follow farm road from Bendigo towards Rise and Shine Creek. Site is in the gully leading south from the third gate (next to small quarry).

2. State of site and possible future damage

Dam damaged by erosin, see below.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Throughout the floor of the gully are monds of tailings (amorphous), resulting from alluvial goldworking. On th saddle which seperates this gully from the next one southwest is an earth dam fed by a water race running along the northfacing hillside. This water race is utilised further back for goldworking in lst gully. Dam contains an area 30m x 25m with an earth wall 1m high and 2m wide.

4. Owner
Address Bendigo Station

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 2694/10 Not visible

6. Reported by C.Jacomb and S.Easdale
Address Bendigo Survey
C.V.D.
Cromwell

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words

alluvial goldworkings, earth dam water race

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

C	T	Type of site
A	G	Local environment today
A	C	Land classification
B	B	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

Site Record Form

NZAA SITE NUMBER: G41/264

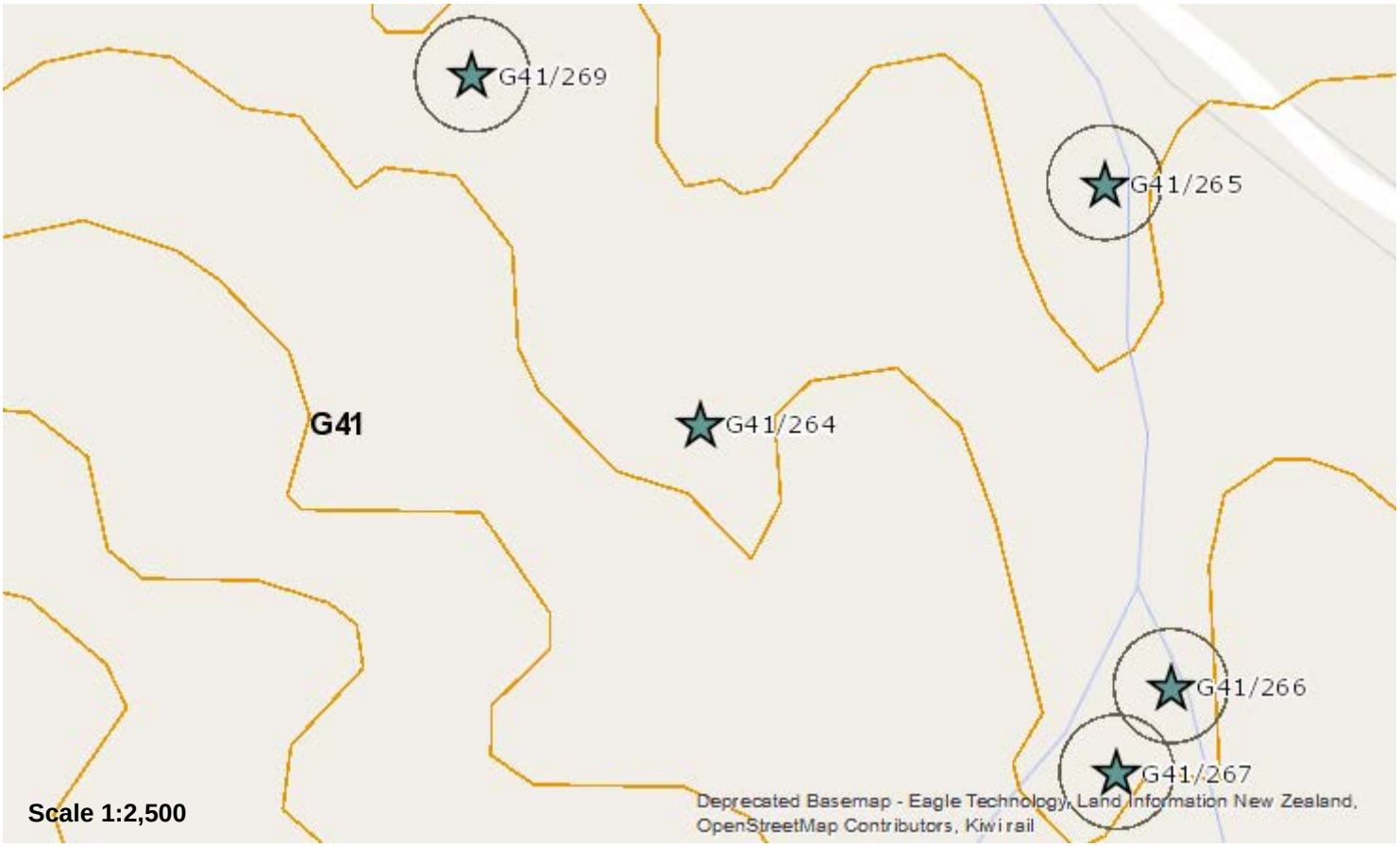
SITE TYPE: Mining - gold

SITE NAME(s): Rise and Shine Creek

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1319112 **Northing:** 5015622 **Source:** Handheld GPS

IMPERIAL SITE NUMBER: S125/29 **METRIC SITE NUMBER:** G41/264



Finding aids to the location of the site

Rise and Shine Creek.

Brief description

Gold workings including water race, dam, at least four sheet-iron barrel hoops, adit, breastwork, tailings, terrace and sluice faces.

Recorded features

Adit, Dam, Sluicings/ sluicing face, Terrace, Water race

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: G41/264

Site description

Updated 25/01/2019 (Field visit), submitted by meganlawrence , visited 20/12/2018 by Lewis, Julia; Scrivener, Phoebe; Jasmine Weston
Grid reference (E1319112 / N5015622)

The lower portion of the site along Thomsons Road was revisited during an archaeological survey of the Thomsons Gorge area. Tailings associated with this site were identified along the valley floor, immediately north of Thomsons Gorge Road spread over an area of 160 m.

Condition of the site

Updated 25/01/2019 (Field visit), submitted by meganlawrence , visited 20/12/2018 by Lewis, Julia; Scrivener, Phoebe; Jasmine Weston

Overgrown in grass and shrub.

Revised coordinates on basis of GPS reading; this is for larger of two dams observed. First dam is about 20m long and 1m high.Second dam is about 15m long and 2m high.Adit almost completely obscured by collapse (2005 update).

Statement of condition

Updated: 24/04/2019, Visited: 20/12/2018 - Good – Majority of visible features are intact, but some minor loss of definition and/or damage

Current land use:

Updated: 24/04/2019, Visited: 20/12/2018 - Grazing

Threats:

Updated: 24/04/2019, Visited: 20/12/2018 - Stock trampling, Farming practices, Erosion, Road/ track formation or maintenance

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/29 29
DATE VISITED August 1980
SITE TYPE Goldworkings
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Reference Easting 3 2 1 6 0 0 Northing 3 8 1 7 0 0

1. Aids to relocation of site *(attach a sketch map)*
Main area of site is located between GR 216 817 and 219 816, the upstream half of the flat valley floor where the road reaches the creek. Access via farm road from Bendigo.

2. State of site and possible future damage
Fair, subject to flood damage.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Alluvial flats have been worked for gold leaving small tailings mounds scattered across them. Several gullies running into the creek from the true left have been extensively sluiced. Water races are visible crossing the hillside on both sides of the creek. Amongst the tailings are some minor pieces of revetted channeling etc. A few hut sites were recorded in this area but most dwellings found in this area of Rise and Shine Creek are situated on the terrace to the right of the road.

Historical information: G.P.Duff 'Sheep may safely graze' p.74.
Duff refers to the working of a sluicing claim at the head of Rise and Shine Creek continuously from the 1860s for a period of 20 years by Christian Hansen and a group of Swedes who constructed a water race leading to the area from Thompsons Creek to the east.

4. Owner
Address Bendigo Station

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* S124/9/C Not visible

6. Reported by C.Jacomb and S.Easdale
Address Bendigo Survey
C.V.D.
Cromwell

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T.)
Oct 1980 CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words
alluvial goldworkings

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

A L	Type of site	B B Present condition and future danger of destruction
A K	Local environment today	A A Security code
A C	Land classification	H P Local body

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER G41/264
DATE VISITED 3/III/2005
SITE TYPE Gold sluicing etc
SITE NAME: MAORI
OTHER Rise and Shine Creek

S125/29

Grid Ref. Easting / / / **2 9 0** / / / Northing / / / **7 7 3** / / /
G.P.S. Easting 2 2 **2 9 0 5 1** Northing 5 5 **7 7 3 4 1**

Note revised Grid Ref on basis of G.P.S. reading; this is for larger of two dams observed. No doubt many other minor features present on the site.

2229111 5577285 Top end of water race running down spur.
2229110 5577315 Bottom end of same section.
2229064 5577294 Dam
Dam is about 15 m long and 2 m high as measured inside, running at 91°, Interior is triangular with apex about 15 m behind middle of breastwork.

2229036 5577391 Hoops from large barrel.
At least four sheet-iron barrel hoops. The three larger hoops are each about 135 mm wide, the largest indicating a barrel of at least 2 m diameter. The smallest hoop, about 110 mm wide, has a very marked "camber", indicating that it could be the end hoop from the same barrel.

2229047 5577346 Adit.
Adit probably originally about 1 m high but almost completely obscured by collapse

2229051 5577341 Dam - **N.B. GPS reading for form is from this feature**..
Breastwork, running at about 55°, is about 20 m long and 1 m high, but the interior may have been infilled by later activities. It appears that the outlet was at the western end, where there are traces of a spillway.

2229209 5577495 Workings at edge of road.*
2229152 5577529 Other side of eastern gully mouth.
2228899 5577682 Top end of tailings between road and creek.
2228849 5577711 Bottom end of tailings between road and creek.
2228836 5577705 Tailing mound between road and sluice faces.*
2228811 5577714 Extremity of sluice faces on hill side of road.*
2228623 5577889 Other extremity of sluice faces on hill side of road.*
2228574 5577905 Terrace remnant, hill side of road.*
2228527 5577922 Bottom end of sluicings, hill side of road.*

- NB: These features show up on map on road or on wrong side of it.
- R. Nichol, 50 Devon St, Picton

Additional Information for Site G41/264

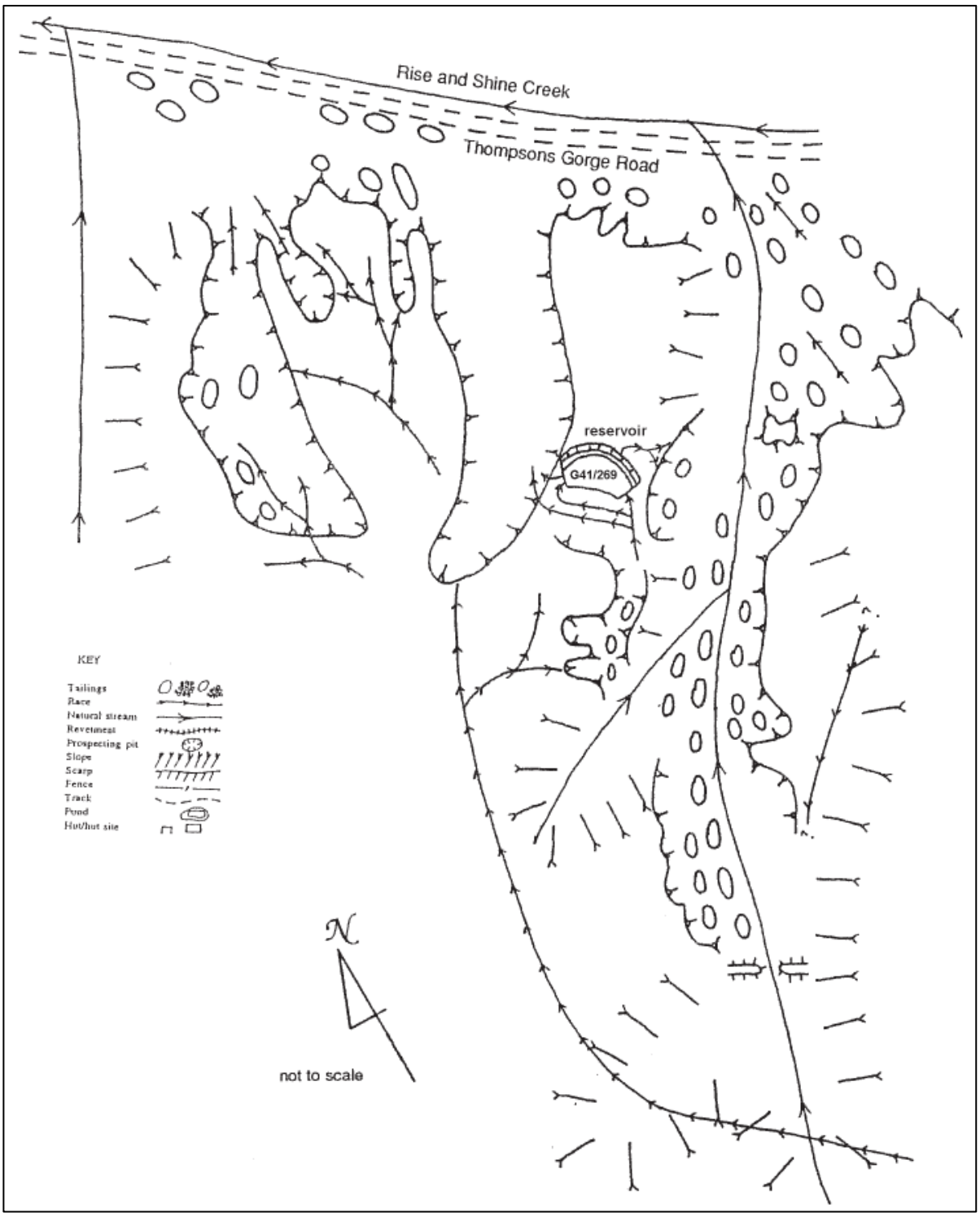


Figure 1 Plan of part of alluvial workings (G41/264) and dam (G41/269) developed from Hamel's (1991: Figure 12 in Nichol and Wright 2006: Figure 10).

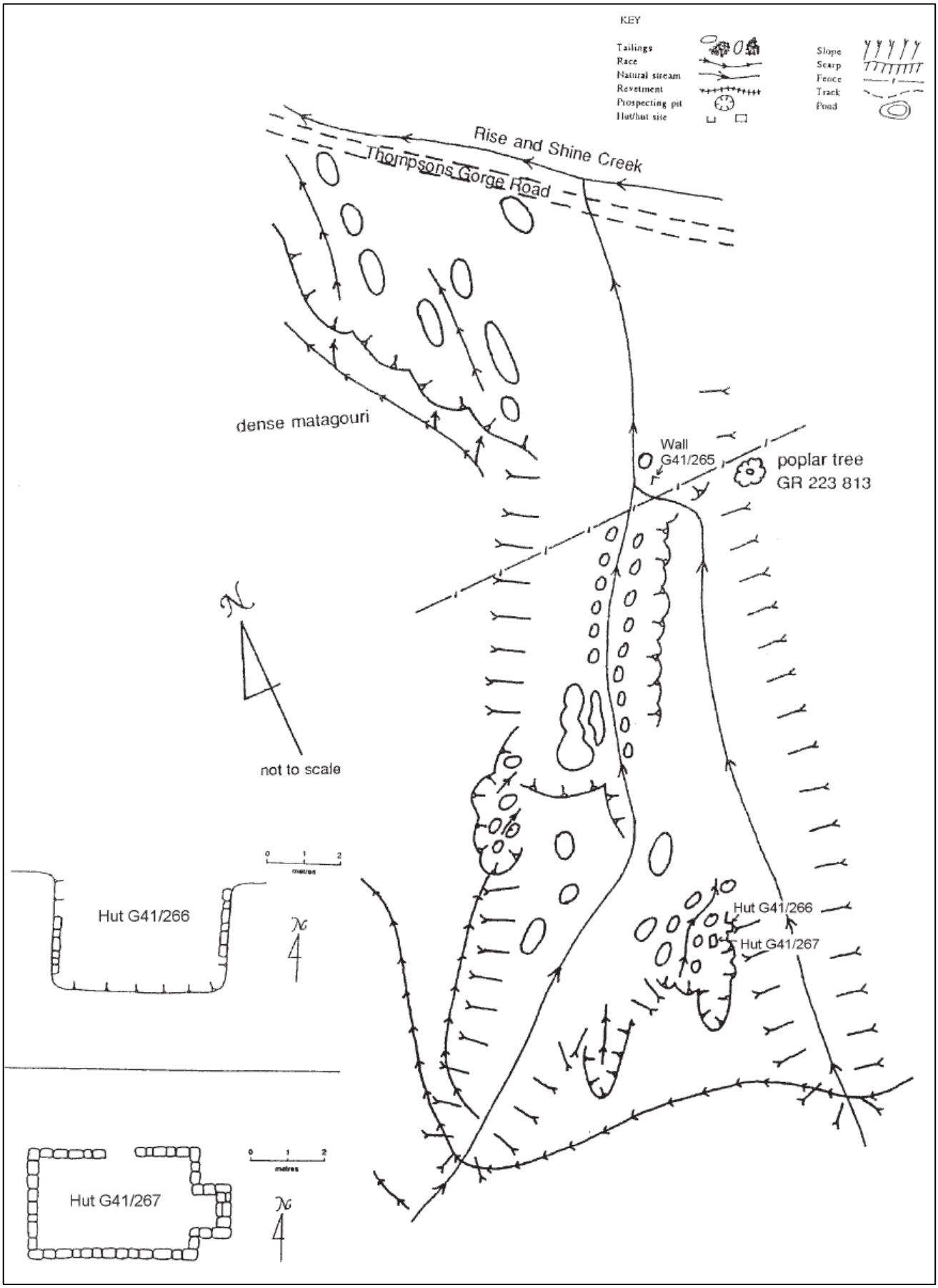


Figure 2 Plan of part of alluvial workings (G41/264) and stone huts (G41/265, G41/266 and G41/267) developed from Hamel's (1991) survey (Nichol and Wright 2006: Figure 10).

Figure 3 Photograph looking southeast at the tailings recorded as part of G41/264. Photograph taken by Phoebe Scrivener on 20/12/18.

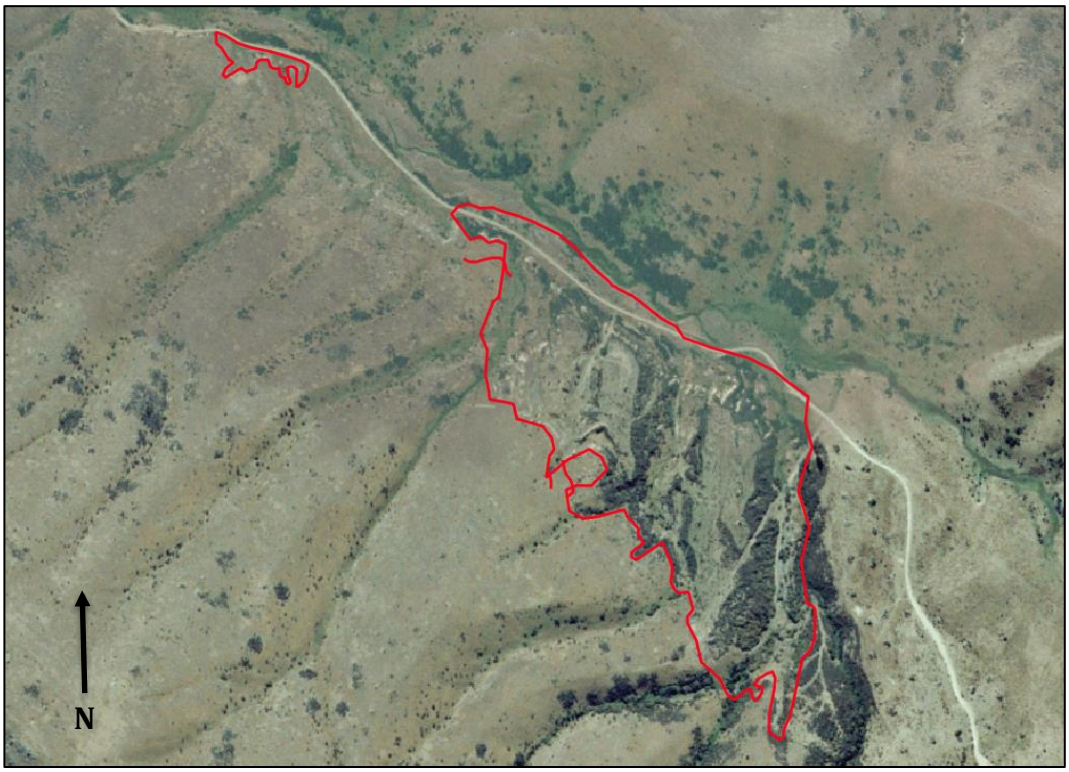


Figure 4 Aerial photograph showing the approximate extent of gold workings recorded as G41/564. Thomsons Gorge Road is shown running through the northern extent of the site. Approximate site extent based on recorded archaeological features, pedestrian survey, aerial photographs and LiDAR.

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: G41/265

SITE TYPE: Historic - domestic

SITE NAME(s): Rise and Shine Creek

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1319254 **Northing:** 5015706 **Source:** Handheld GPS

IMPERIAL SITE NUMBER: S125/30 **METRIC SITE NUMBER:** G41/265

Finding aids to the location of the site

Rise and Shine Creek.

Brief description

Stone hut.

Recorded features

Hut floor/ site

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: G41/265

Site description

Condition of the site

GPS reading is for inside corner of wall remnant (2005).

Statement of condition

Current land use:

Threats:

NB2/FN45
30

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/30
DATE VISITED August 1980
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Reference Easting 3 2 1 9 0 0 Northing 3 8 1 5 0 0

1. Aids to relocation of site *(attach a sketch map)*

Follow farm road from Bendigo to Rise and Shine Creek. Ford Creek and continue along road on true left until reaching the second gate. Followup fenceline to right (awat from creek). Site is 60m up fence line.

2. State of site and possible future damage

Most of hut has been demolished while putting in the fence.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

One corner of the structure remains, built of stacked schist up to 0.6m high. See diagram.

4. Owner Address Bendigo Station
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* S124/9/C Not visible

6. Reported by Address C.Jacomb and S.Easdale
Bendigo Survey
C.V.D.
Cromwell

Filekeeper Date NEVILLE A RITCHIE
ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words

stone hut

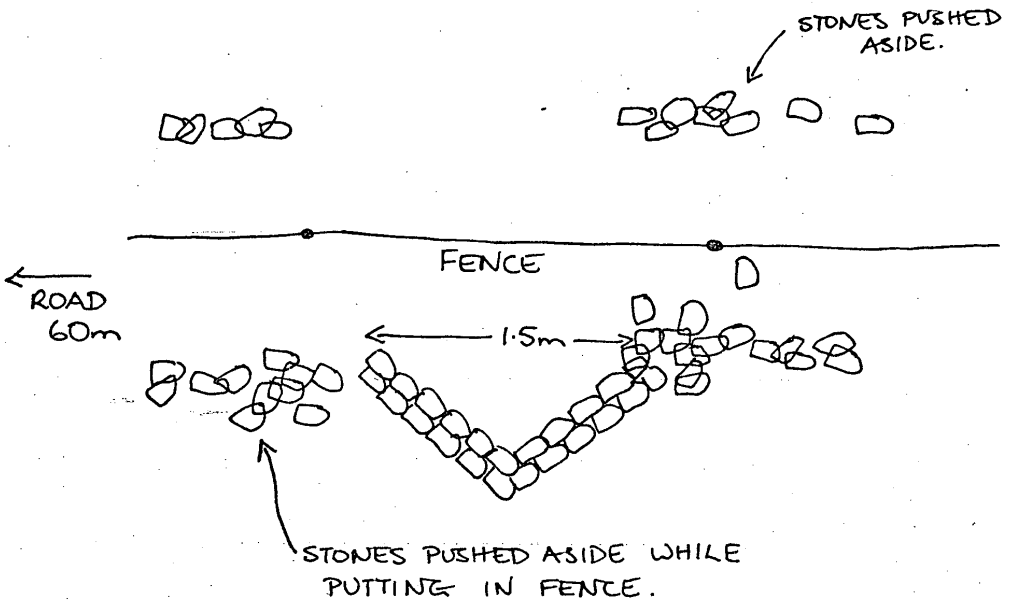
8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

F	K	Type of site
A	K	Local environment today
A	C	Land classification
B	C	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

NB2/FN45

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE DESCRIPTION FORM	SITE NUMBER S125/30
Map Number S125 Map Name St Bathans Map Edition 1st 1969 Grid Reference 219 815	SITE NAME: MAORI / OTHER Rise and Shine Creek
	SITE TYPE Stone hut

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER S41/265
DATE VISITED 3/III/2005
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

S41/265

Grid Ref. Easting / / / **2 9 1** / / / Northing / / / **7 7 4** / / /
G.P.S. Easting 2 2 **2 9 1 9 3** Northing 5 5 **7 7 4 2 5**

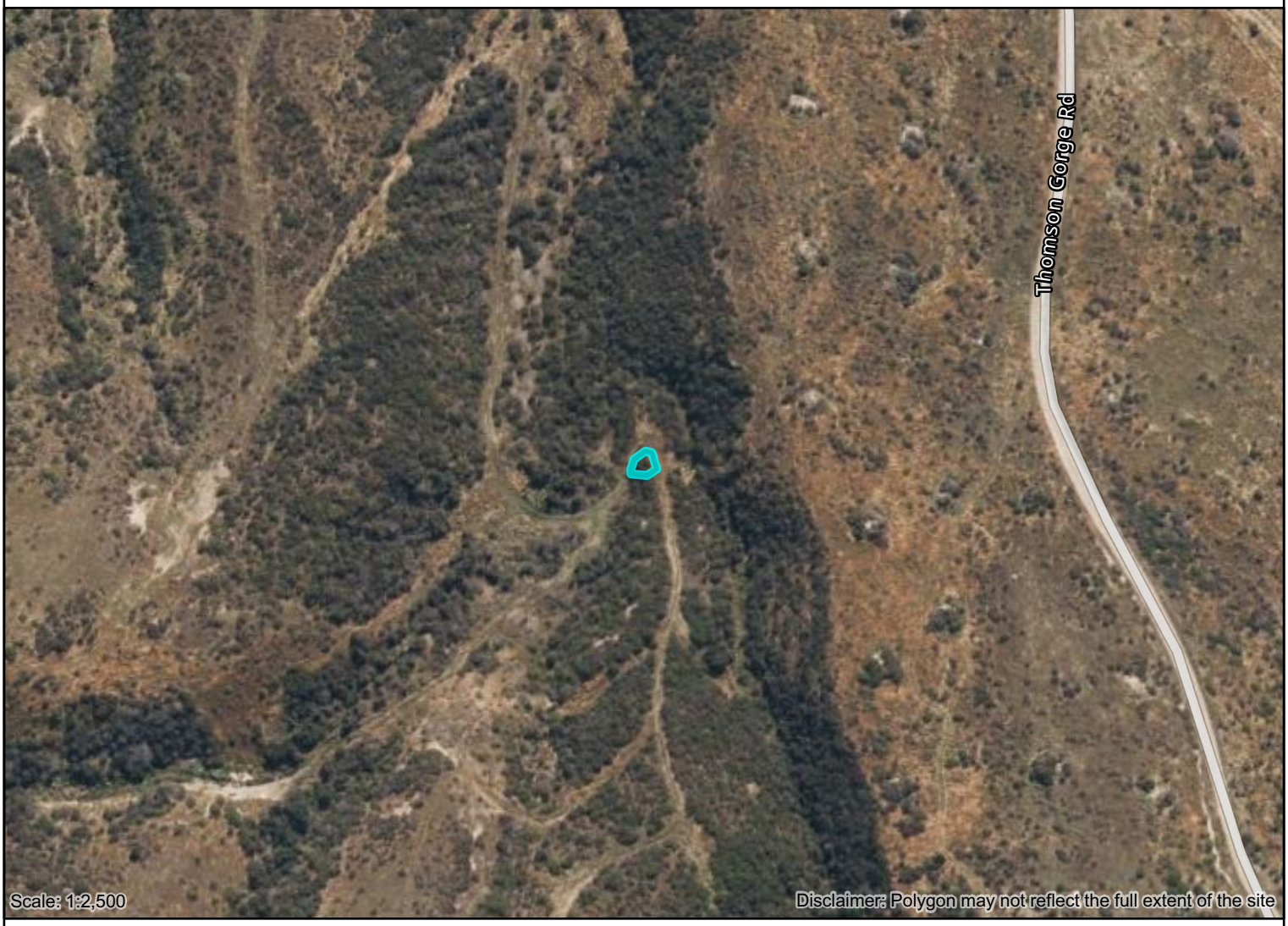
Note revised Grid Ref on basis of G.P.S. reading

G.P.S. reading is for inside corner of wall remnant.

Site Record Form

ARCHSITE archaeological site recording scheme

NZAA Site Number:	G41/266	**Site Coordinates (NZTM)**	
Imperial Site Number:	S125/31	**Easting:**	1319277
Site Type:	Historic - domestic	**Northing:**	5015530
Site Name(s):	Rise and Shine Creek	**Source:**	Shapefile



Finding Aids to the Location of the Site:

Follow farm track south from Thomsons Gorge Road along fence, site is on uphill side of hairpin bend.

Brief Description:

Remains of stone hut

Condition of Site when last visited:

Fair

Site Periods:

Colonial 1840-1900

Ethnicity:

Non Maori

Site Features:

Building - hut, Stone wall

Associated Sites:

G41/264

Description:

Updated 10/01/2025 (Field Visit), submitted by: NZHP_NaomiWoods_ArchSite, visited 13/02/2018 by Woods, Naomi

As of 2018, hut remains in same condition as described in 1980 Site Record Form but now entirely overgrown with briar and matagouri. Still discernible in person but close to impossible to photograph.

Condition Notes:

Updated 10/01/2025 (Field Visit), submitted by: NZHP_NaomiWoods_ArchSite, visited 13/02/2018 by Woods, Naomi

Hut is ruinous but remaining portion is in fair condition. Overgrown.

New GPS reading 2005.

Images for Site G41/266

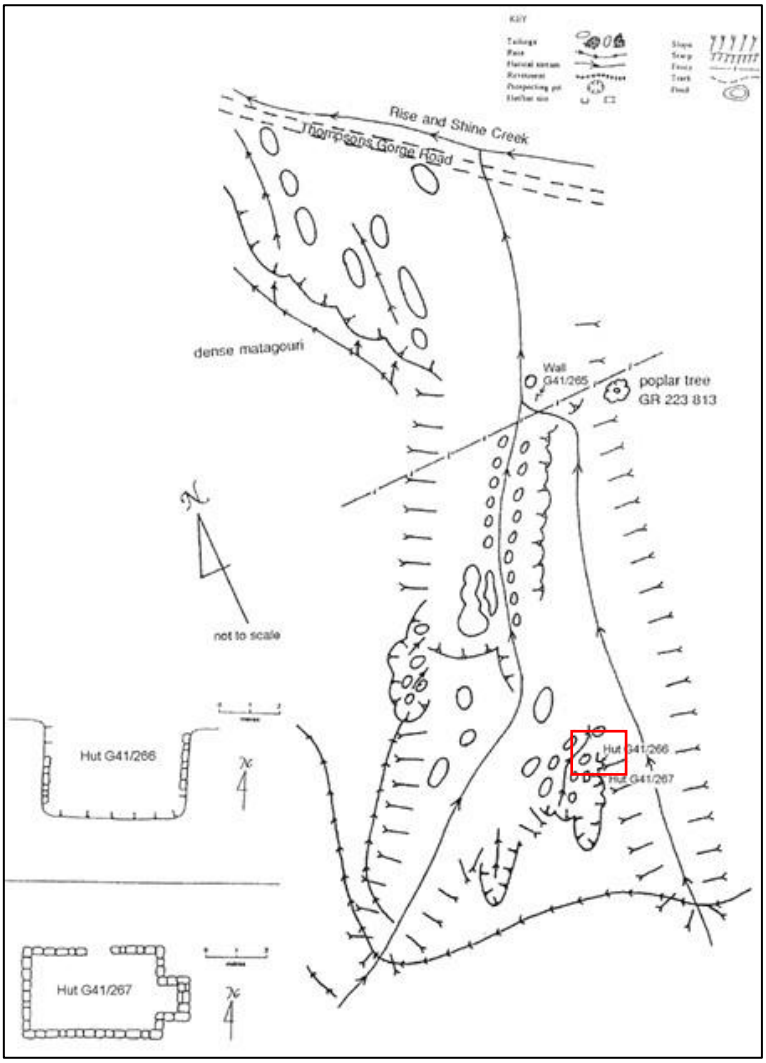


Figure 1. Sketch plan of eastern half of G41/264 and associated sites (G41/266 outlined in red) created following Hamel's (1993) survey and updated with site numbers in 2005 (Nichol & Wright, 2006).

Figure 2. Site G41/266 rear wall in 2005 (Nichol & Wright, 2006).

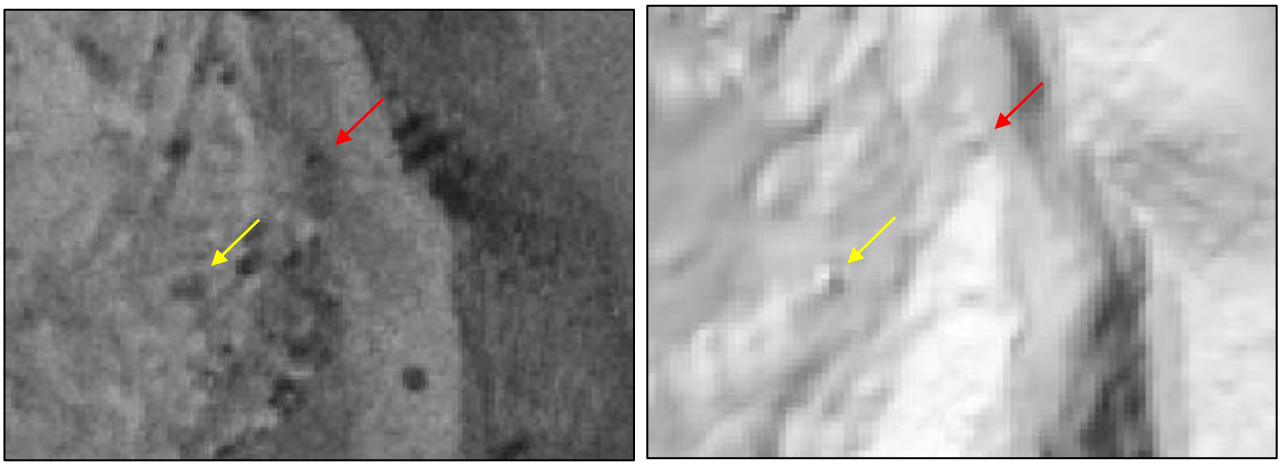


Figure 3. 1958 Aerial photograph (left) and 2018 LiDAR imagery (right) showing anomalies in location of hut G41/266 (red arrow) and G41/267 (yellow arrow).

Figure 4. Looking south towards site G41/266 in 2018, with its approximate location indicated by the red arrow.

References

Hamel, J. (1993). *The rich fields of Bendigo*. Department of Conservation.

Nichol, R., & Wright, L. (2006). *Archaeological Sites on Rise and Shine Creek & Clearwater Creek, Bendigo Goldfield. EP40481*.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

S125/31

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER G41/**266**
DATE VISITED 3/III/2005
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Ref. Easting / / / **2 9 2** / / / Northing / / / **7 7 2** / / /
G.P.S. Easting 2 2 **2 9 2 1 6** Northing 5 5 **7 7 2 4 9**

Note revised Grid Ref on basis of G.P.S. reading

R. Nichol, 50 Devon St, Picton

NB2/FN 47.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM

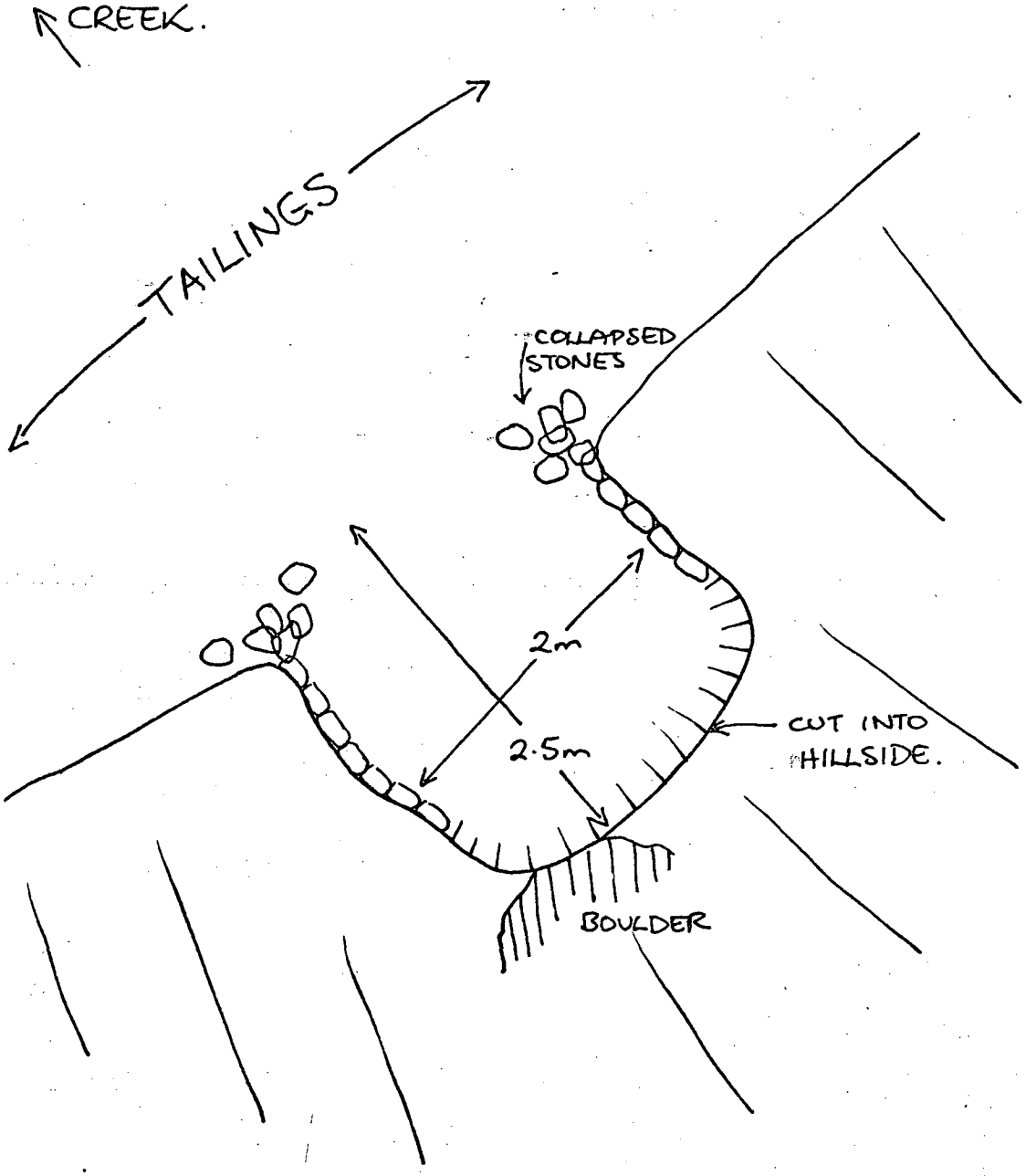
Map Number	S125
Map Name	St Bathans
Map Edition	1st 1969
Grid Reference	218 814

SITE NUMBER S125/31 (31)

SITE NAME: MAORI / OTHER Rise and Shine Creek

SITE TYPE Stone hut (?)

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)



NB2/FN47

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/31 31
DATE VISITED August 1980
SITE TYPE Stone hut (?)
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Reference Easting 3 2 1 8 0 0 Northing 3 8 1 4 0 0

1. Aids to relocation of site *(attach a sketch map)*

Follow farm road from Bendigo to Rise and Shine Creek. Cross creek and continue up true left to 2nd gate. Site is in gully leading south from here, 30m down stream of S125/32 .

2. State of site and possible future damage

If this was a hut the entire front wall is missing and other walling is collapsed and overgrown.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Hut is built into bank utilising bank as entire back wall and part of sides - stonework has been used to retain bank. Walling is up to 1m high. Cutting in bank is 1.7m high.

4. Owner Address Bendigo Station
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* S124/9/C Not visible

6. Reported by Address C.Jacomb and S.Easdale
Bendigo Survey
C.V.D.
Cromwell

Filekeeper Date NEVILLE A RITCHIE
ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words

stone hut

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

F	K	Type of site
A	G	Local environment today
A	C	Land classification

C	A	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: G41/267

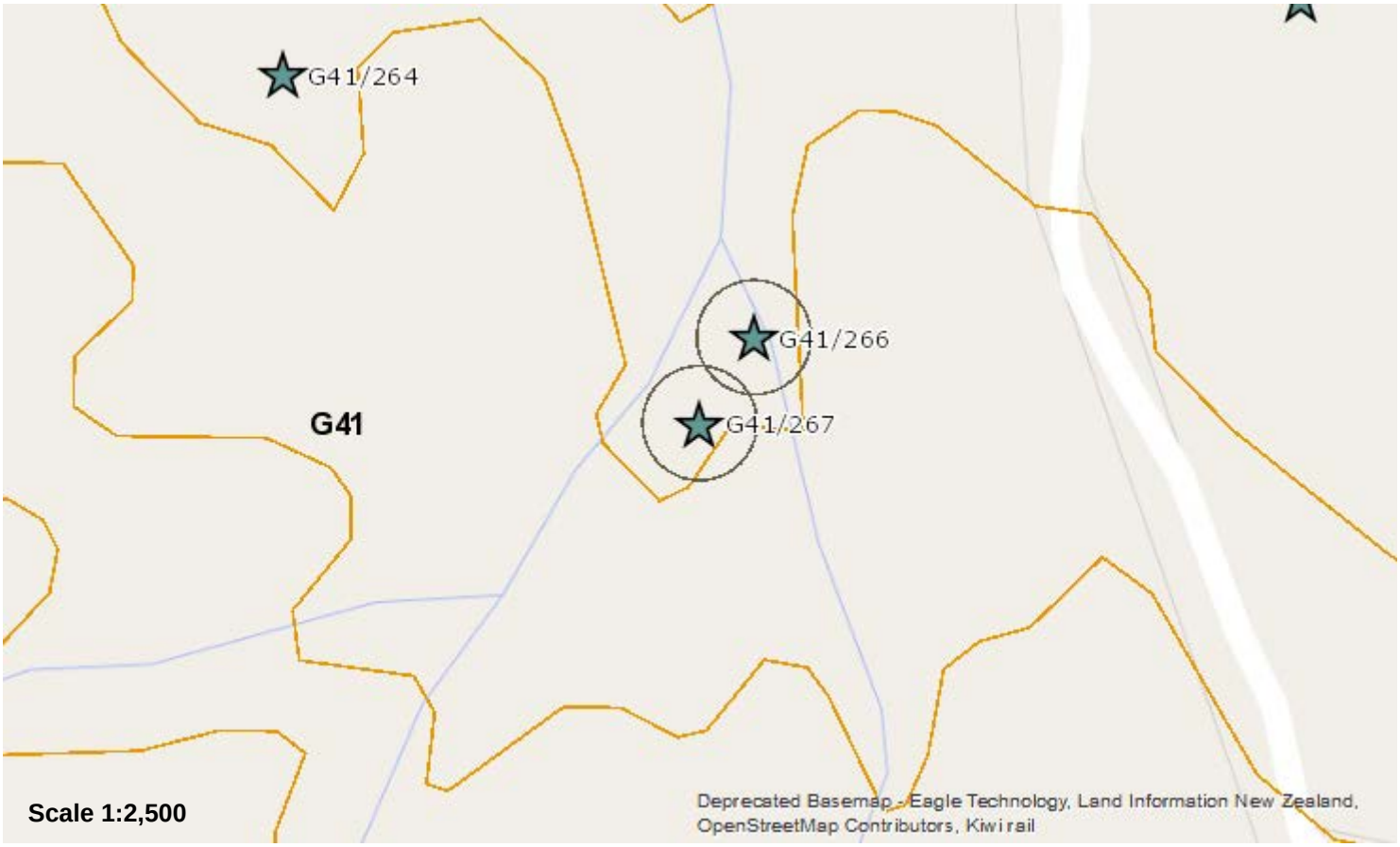
SITE TYPE: Historic - domestic

SITE NAME(s): Rise and Shine Creek

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1319258 **Northing:** 5015500 **Source:** Handheld GPS

IMPERIAL SITE NUMBER: S125/32 **METRIC SITE NUMBER:** G41/267



Finding aids to the location of the site

Rise and Shine Creek.

Brief description

Stone hut with chimney.

Recorded features

Chimney, Hut floor/ site

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: G41/267

Site description

Condition of the site

GPS reading is for corner of wall and chimney (2005).

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/32 32
DATE VISITED August 1980
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Reference Easting 3 2 1 8 0 0 Northing 3 8 1 4 0 0

1. Aids to relocation of site *(attach a sketch map)*
Follow farm road from Bendigo to Rise and Shine Creek, cross creek and continue up true left to 2nd gate. The site is at the top end of the small gully running south (away from creek) at this point.

2. State of site and possible future damage
Remaining walls are in a state of collapse, gable ends are best preserved. Back of chimney has fallen away.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
Built of stacked mortared schist. Chimney stands 2.5m high. Other walls are up to 2.3m high at gable end. The chimney has been deliberately blocked up with stone.

4. Owner Address Bendigo Station
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo survey
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)* S124/9/C Not visible

6. Reported by Address C.Jacomb and S.Easdale
Bendigo Survey
C.V.D.
Cromwell
Filekeeper Date NEVILLE A RITCHIE
ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words
stone hut

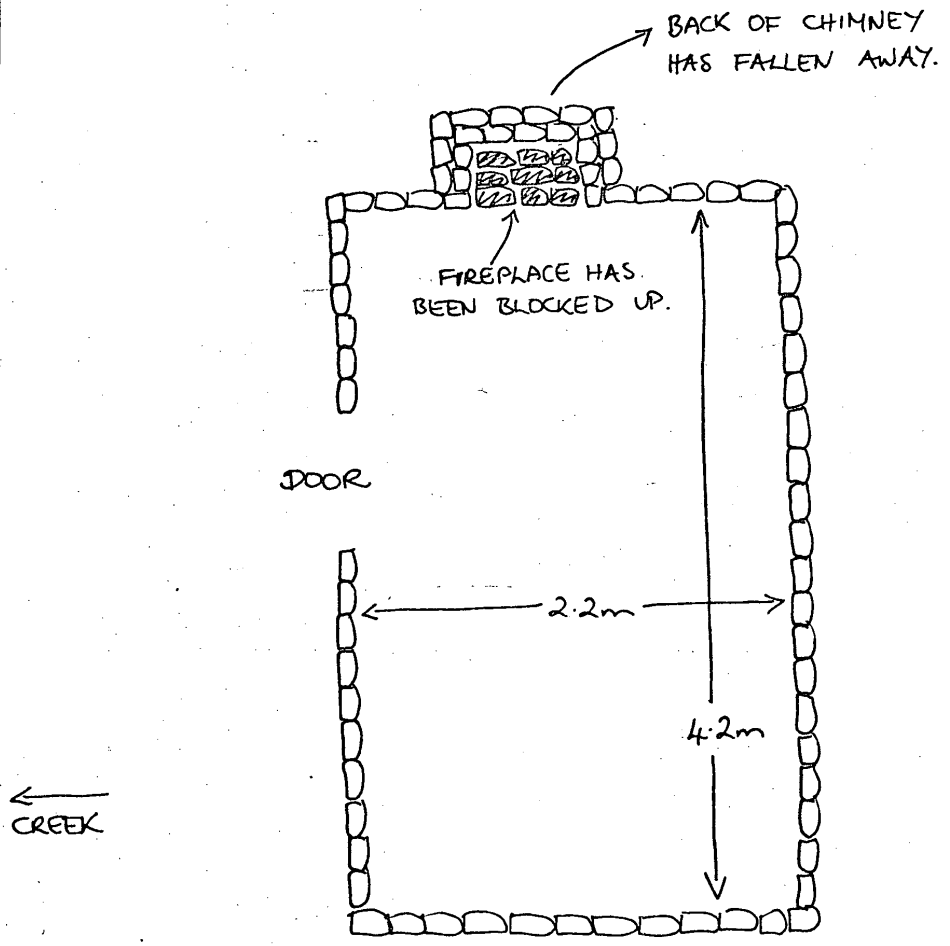
8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

F K	Type of site	B B Present condition and future danger of destruction
A G	Local environment today	A A Security code
A C	Land classification	H P Local body

NBR/FN46

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE DESCRIPTION FORM Map Number S125 Map Name St Bathans Map Edition 1st 1969 Grid Reference 218 814	SITE NUMBER S125/32 (32) SITE NAME: MAORI / OTHER Rise and Shine Creek SITE TYPE Stone hut

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER G41/267
DATE VISITED 3/III/2005
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

S125/32

Grid Ref.	Easting	/	/	/	**2**	**9**	**1**	/	/	/	Northing	/	/	/	**7**	**7**	**2**	/	/	/
G.P.S.	Easting	2	2		**2**	**9**	**1**	**9**	**7**		Northing	5	5		**7**	**7**	**2**	**1**	**9**	

Note revised Grid Ref on basis of G.P.S. reading

G.P.S. reading is for corner of wall and chimney

R. Nichol, 50 Devon St, Picton

Site Record Form

NZAA SITE NUMBER: G41/269

SITE TYPE: Mining - gold

SITE NAME(s): Rise and Shine Creek

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1319033 **Northing:** 5015744 **Source:** Handheld GPS

IMPERIAL SITE NUMBER: S125/34 **METRIC SITE NUMBER:** G41/269

Finding aids to the location of the site

Rise and Shine Creek.

Brief description

Dam. Face of dam curves around an area of high ground to enclose an elongated kidney-shaped interior about 10 m wide. It appears that the dam outlet is a tunnel low on the face located about 7m from the W end of the dam.

Recorded features

Dam

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: G41/269

Site description

Condition of the site

Some of interior is almost filled with tailings. GPS reading is for apex of breastwork (2005).

Statement of condition

Current land use:

Threats:

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/34 (34)
DATE VISITED August 1980
SITE TYPE Dam
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Reference Easting 3 2 1 6 0,0 Northing 3 8 1 6 0,0

1. Aids to relocation of site *(attach a sketch map)*
Follow farm road to Rise and Shine Creek. Cross creek and continue past gate to 2nd gate (by poplar), turn around and pass 2 worked gullies on the left. The dam is between the 2nd and 3rd gullies approx 80m from the road and visible from it. See diagram.

2. State of site and possible future damage
Good, slightly breached in places.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
Crescent shaped, 25 x 15m. 3m deep at deepest point. Revetted wall is 3m thick, see diagram.

4. Owner
Address Bendigo Station

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* S124/9/C Not visible

6. Reported by C.Jacomb and S.Esdale
Address Bendigo Survey
C.V.D.
Cromwell

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words
dam

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

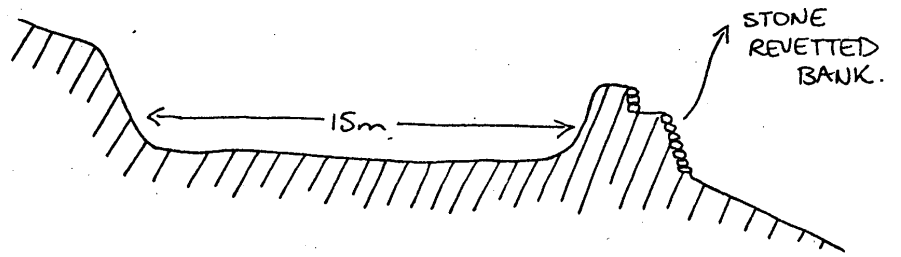
G D	Type of site
A K	Local environment today
A C	Land classification
A B	Present condition and future danger of destruction
A A	Security code
H P	Local body

NB2/FN50

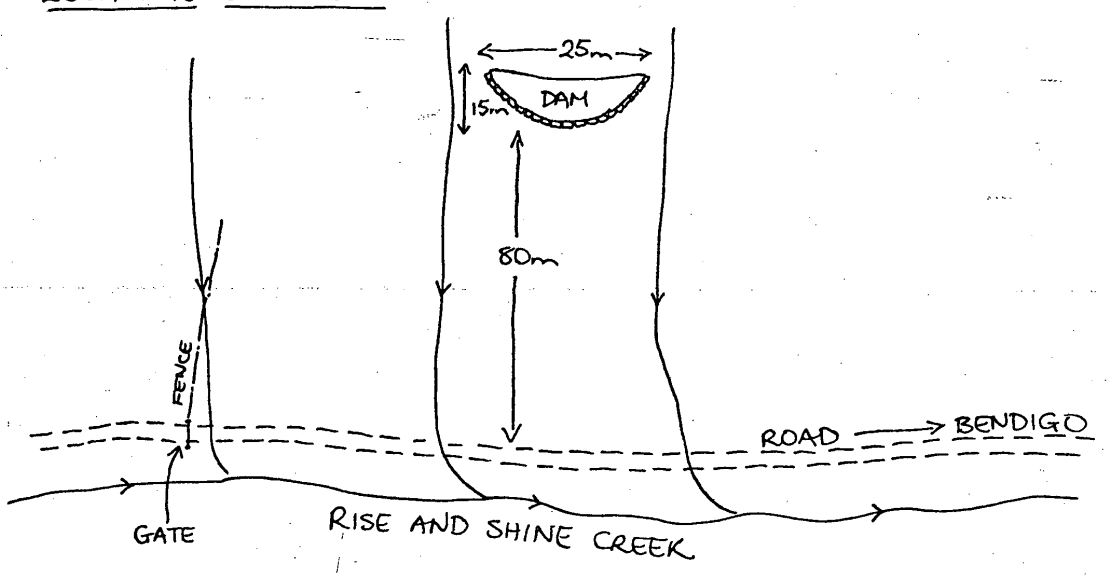
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION SITE DESCRIPTION FORM Map Number S125 Map Name St Bathans Map Edition 1st 1969 Grid Reference 216 816	SITE NUMBER S125/34 (34) SITE NAME: MAORI / OTHER Rise and Shine Creek SITE TYPE Dam

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)

CROSS-SECTION OF DAM



LOCATION DIAGRAM.



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER G41/269
DATE VISITED 3/III/2005
SITE TYPE Dam
SITE NAME: MAORI
OTHER Rise and Shine Creek

S125/34

Grid Ref. Easting / / / **2 8 9** / / / Northing / / / **7 7 4** / / /
G.P.S. Easting 2 2 **2 8 9 7 2** Northing 5 5 **7 7 4 6 3**

Note revised Grid Ref on basis of G.P.S. reading

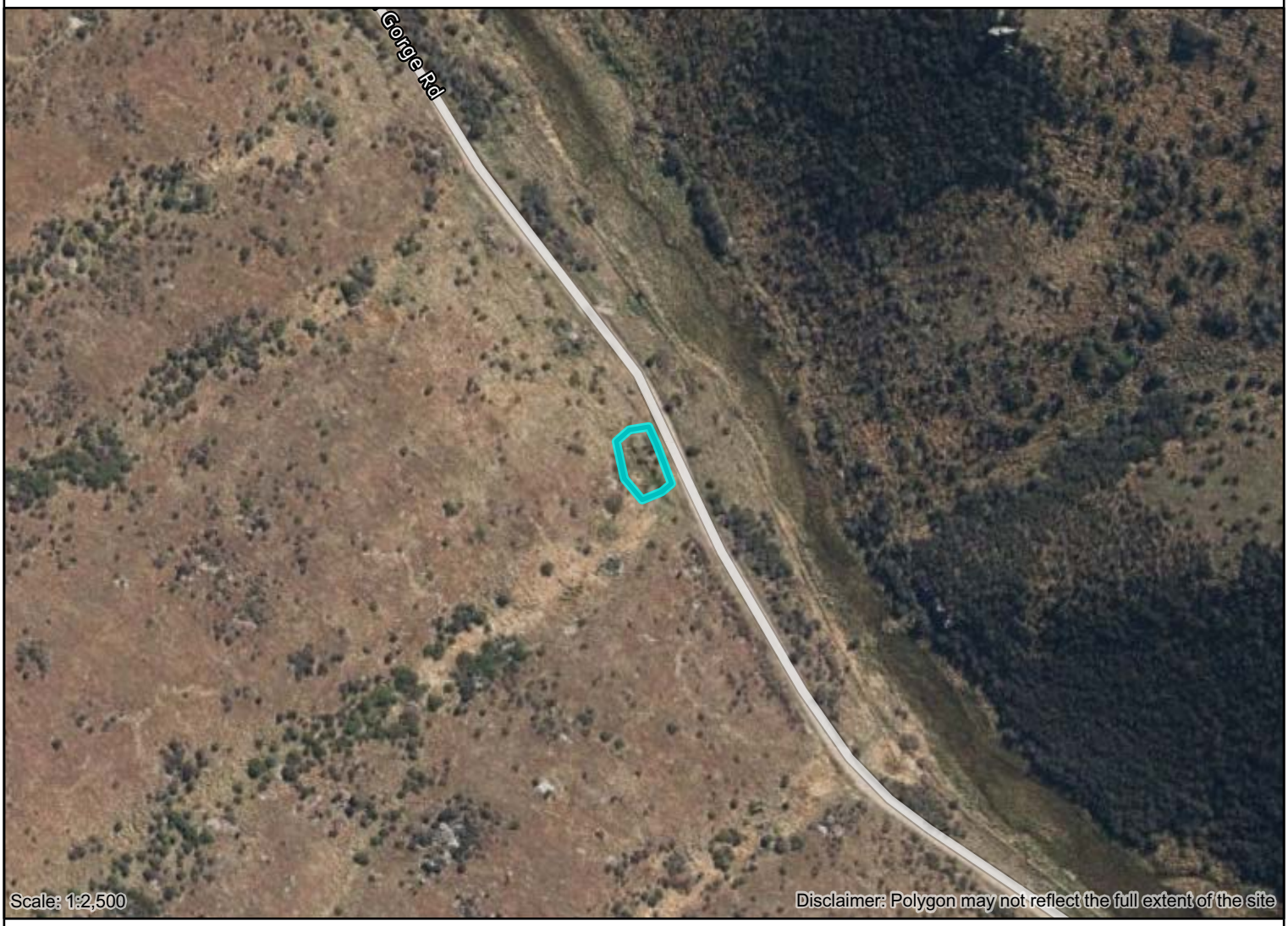
G.P.S. reading is for apex of breastwork

2228937 5577439 Western end of dam breastwork.
2228972 5577463 Apex of breastwork, north side
2228992 5577428 South-eastern end of breastwork..
Face of dam curves around an area of high ground to enclose a curious elongated kidney-shaped interior about 10 m wide. It appears that the dam outlet is a tunnel low on the face located about 7 m from the western end of the dam, and a curving race carries the water across the face of the dam and off to the east. Continuation of breastwork of dam is visible beyond easternmost of the three GPS record sites but interior here is almost filled with tailings.
R. Nichol, 50 Devon St, Picton

Site Record Form

ARCHSITE archaeological site recording scheme

NZAA Site Number:	G41/273	**Site Coordinates (NZTM)**	
Imperial Site Number:	S125/38	**Easting:**	1318232
Site Type:	Historic - domestic	**Northing:**	5016439
Site Name(s):	Rise and Shine Creek	**Source:**	Shapefile



Finding Aids to the Location of the Site:

Rise and Shine Creek. Follow Thomsons Gorge Road southeast from modern farm dam for approximately 700m, site is on south side of road

Brief Description:

Stone walls of hut

Condition of Site when last visited:

Not Visible

Site Periods:

Colonial 1840-1900

Ethnicity:

Non Maori

Site Features:

Building - hut, Stone wall

Associated Sites:

Description:

Updated 10/01/2025 (Other), submitted by: NZHP_NaomiWoods_ArchSite

Hut remains were unable to be relocated on the ground in surveys undertaken by New Zealand Heritage Properties from 2018-2024, but seen on 2018 LiDAR imagery. As per previous SRF, low lying remnants of stacked schist hut, now covered by long grass.

Condition Notes:

Updated 10/01/2025 (Other), submitted by: NZHP_NaomiWoods_ArchSite

Unable to be located in the field, heavily overgrown with long grass.

New GPS reading for site 2005.

Images for Site G41/273

Figure 1. Looking west at site G41/273 (stones just visible in centre of image) (Nichol & Wright, 2006).

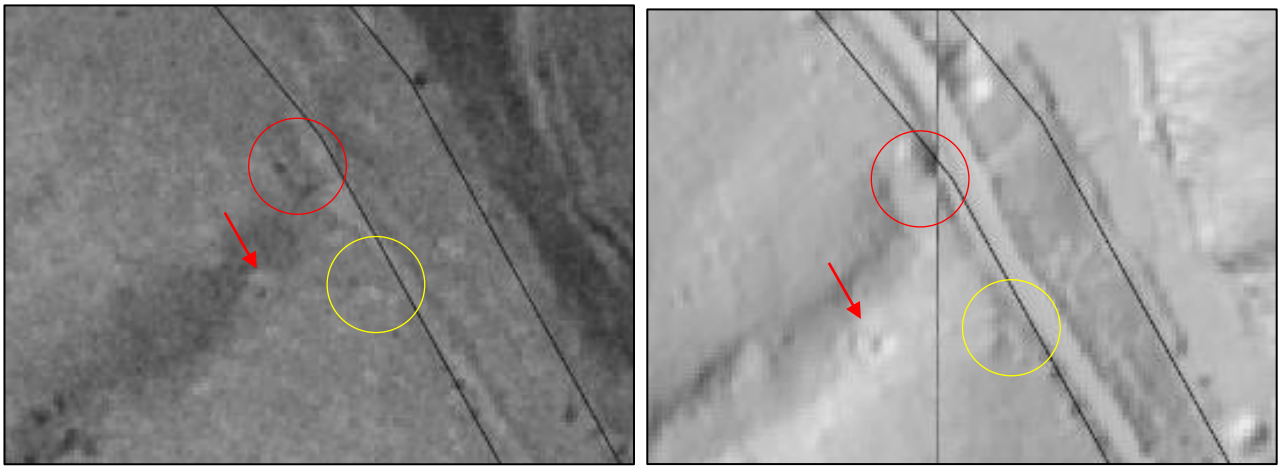


Figure 2. 1958 Aerial photograph (left) and LiDAR imagery (right) showing the location of site G41/273 (circled red) and site G41/606 (circled yellow). The red arrow indicates a more intact hut site (G41/272) that sits outside the project area.

References

Nichol, R., & Wright, L. (2006). *Archaeological Sites on Rise and Shine Creek & Clearwater Creek, Bendigo Goldfield. EP40481*.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER G41/273
DATE VISITED 3/III/2005
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

S125/38

Grid Ref.	Easting	/	/	/	**2**	**8**	**1**	/	/	/	Northing	/	/	/	**7**	**8**	**1**	/	/	/
G.P.S.	Easting	2	2		**2**	**8**	**1**	**7**	**3**		Northing	5	5		**7**	**8**	**1**	**5**	**8**	

Note revised Grid Ref on basis of G.P.S. reading

NB: Feature shows up on map on road or on wrong side of it.

R. Nichol, 50 Devon St, Picton

NB2 /FN45

38

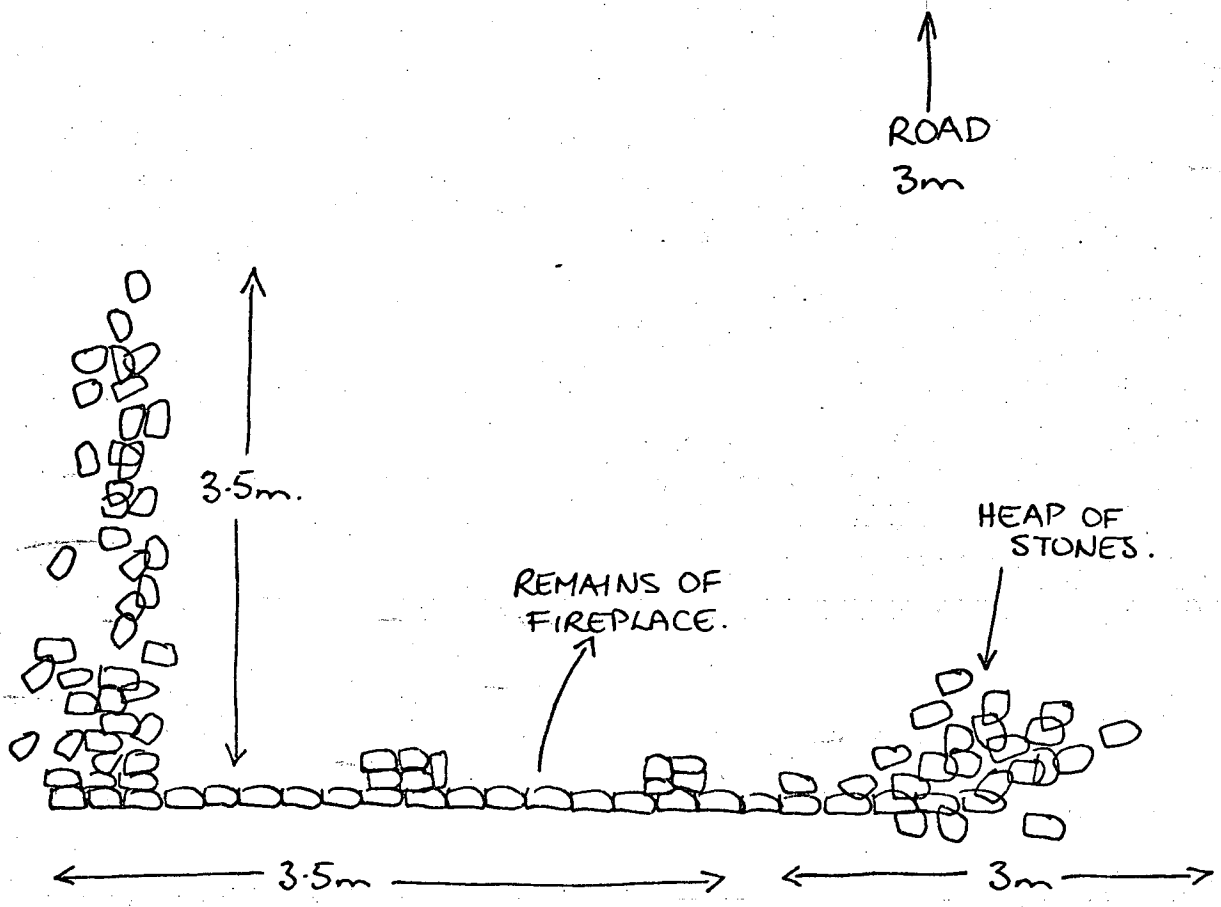
NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM

Map Number	S125
Map Name	St Bathans
Map Edition	1st 1969
Grid Reference	213 820

SITE NUMBER	S125/38
SITE NAME: MAORI / OTHER	Rise and Shine Creek
SITE TYPE	Stone hut

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/38
DATE VISITED August 1980
SITE TYPE Stone hut
SITE NAME: MAORI
OTHER Rise and Shine Creek

Grid Reference Easting 3 2 1 3 0,0 Northing 3 8 2 0 0,0

1. Aids to relocation of site *(attach a sketch map)*
Follow farm road from Bendigo to Rise and Shine Creek, cross and continue up true left for about 600m. Site is 4m from the right of the road, 15m from S125/37.

2. State of site and possible future damage
Badly collapsed and overgrown.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
Situated on a small terrace 3m above the road. Built of stacked schist, mortared. Wall of fireplace is 50cm high, remainder of ouline consists of low rubble mounds.

4. Owner
Address Bendigo Station

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* S124/9/C Not visible

6. Reported by C.Jacomb and S.Easdale
Address Bendigo Survey
C.V.D.
Cromwell

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words stone hut

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

F	K	Type of site
B	D	Local environment today
A	C	Land classification

B	B	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

Site Record Form

ARCHSITE archaeological site recording scheme

NZAA Site Number:	G41/277	**Site Coordinates (NZTM)**	
Imperial Site Number:	S125/42	**Easting:**	1317748
Site Type:	Mining - gold	**Northing:**	5016974
Site Name(s):	Rise and Shine Mine	**Source:**	Shapefile

Finding Aids to the Location of the Site:

Rise and Shine Creek, on south side of road.

Brief Description:

Mine and 1930s battery site. Features include adits, sluice face, spoil, machine foundations, dam, stone faced terrace (possible dam).

Condition of Site when last visited:

Good

Site Periods:

Modern 1900-

Ethnicity:

Non Maori

Site Features:

Adit, Dam, Foundations, Sluicings/ sluicing face, Stamper battery, Terrace - stone faced, Tramway

Associated Sites:

Description:

Updated 25/01/2019 (Field visit), submitted by meganlawrence by Lewis, Julia; Scrivener, Phoebe; Lawrence, Megan; Jasmine Weston
Grid reference (E1317748 / N5016974)

Mine and battery site revisited as part of archaeological survey of the Thomson Gorge area.
The mining complex has been the location of mining operations since 1872. The site is shown in survey plan SO 2086, dating to 1876, as the Eureka Mine. However, this site was used by multiple syndicates in the nineteenth and twentieth centuries, including the Rise and Shine, Jubilee and Bendigo Rise and Shine Syndicates (Carpenter, 2013b). The site exists today as cumulatively described in earlier site record form updates and Hamel's (1993) plans of the site. The revetted roadway or tramway was re-identified during the site survey, the southeast extent of the track was heavily vegetated, and it was not possible to completely view its full extent as identified in the initial site record form.

Condition Notes:

Updated 25/01/2019 (Field visit), submitted by meganlawrence by Lewis, Julia; Scrivener, Phoebe; Lawrence, Megan; Jasmine Weston

Heavily overgrown in long grass and shrub

GPS reading taken on battery proper (2005).

Additional Information for Site G41/277

Figure 1 Photograph looking southwest at concrete machine foundations recorded as part of G41/277. Photograph taken by Megan Lawrence on 17/12/18.

Figure 2 Photograph looking southwest at mine recorded as G41/277, showing adit, stone faced dam and sluice face. Photograph taken by Megan Lawrence on 17/12/18.

Figure 3 Photograph looking northwest of revetted tramway recorded as part of G41/277. Photograph taken by Megan Lawrence on 17/12/18.

Figure 4 Photograph looking north of revetted tramway recorded as part of G41/277. Photograph taken by Megan Lawrence on 17/12/18.

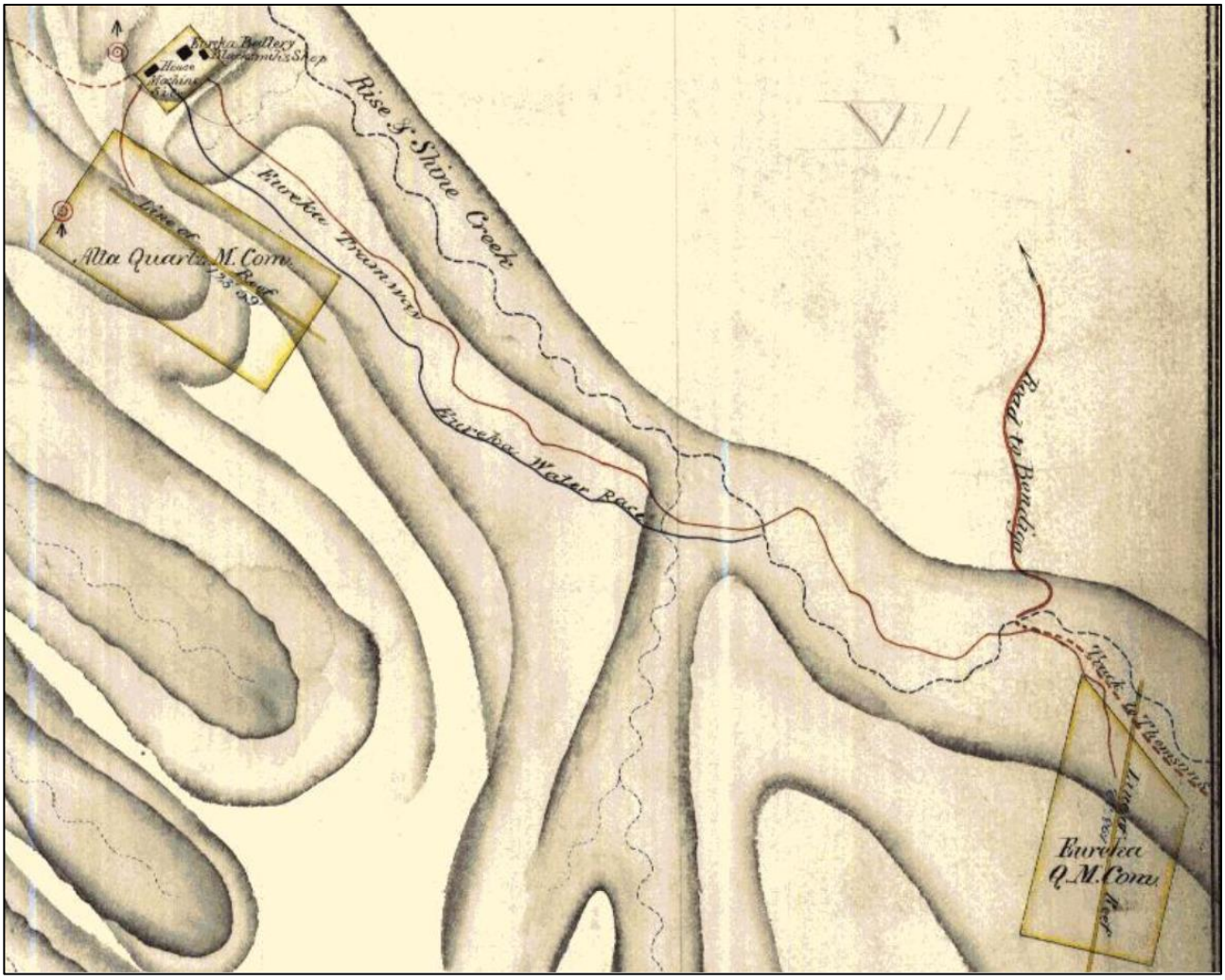


Figure 5 Survey plan SO 2086 (1876) showing the Eureka reef at the location of the Rise and Shine mine and battery site (G41/277), in relation to the Eureka mine and battery site (G41/252) and the Alta reef around the site of the Alta battery site (G41/253). The plan also shows the Eureka Water Race and the Eureka Tramway recorded as part of the Eureka Mine and battery (G41/252) (Source: QuickMaps).

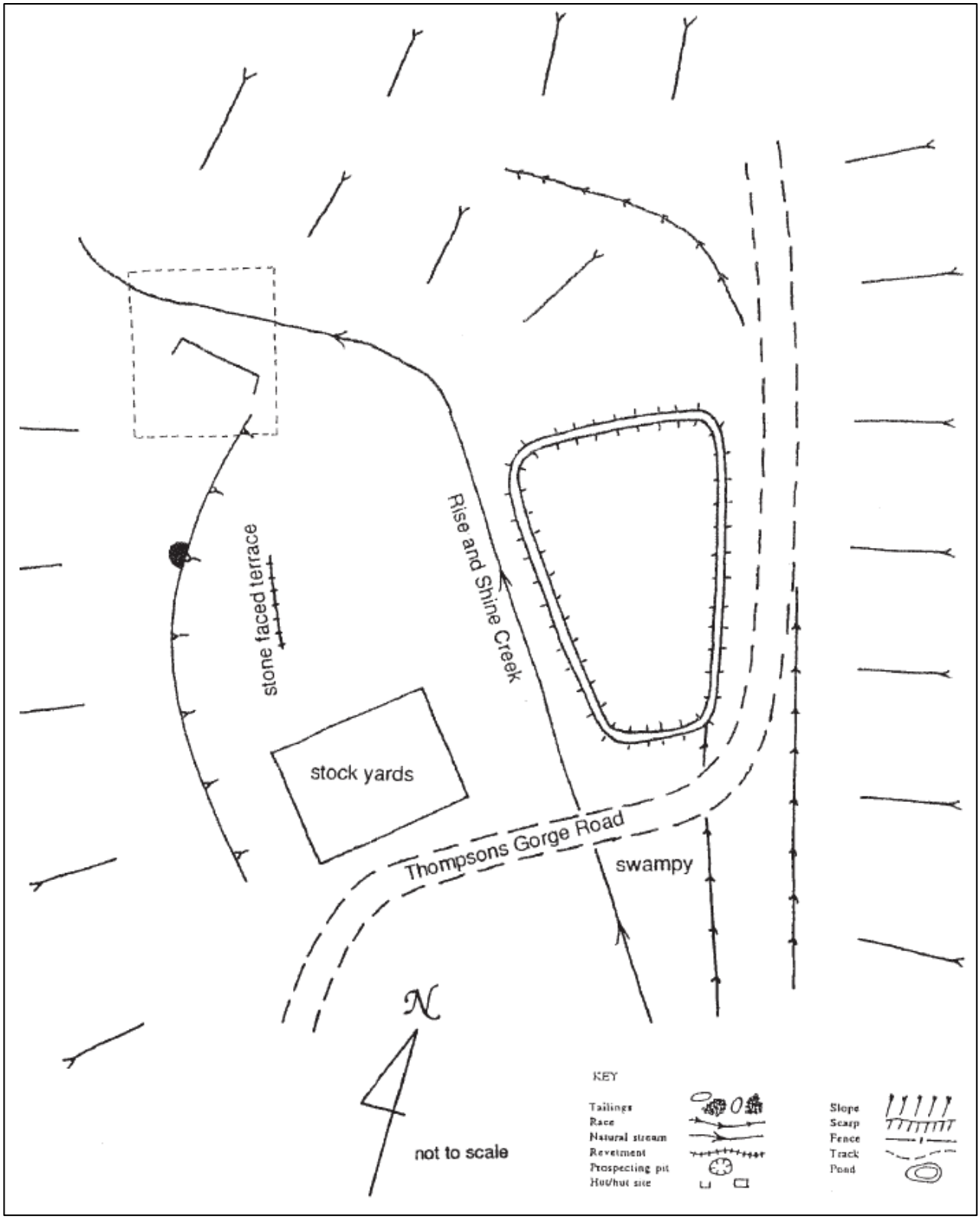


Figure 6 Plan of part Rise and Shine mine and battery (G41/277) (Hamel, 1993: Figure 17).

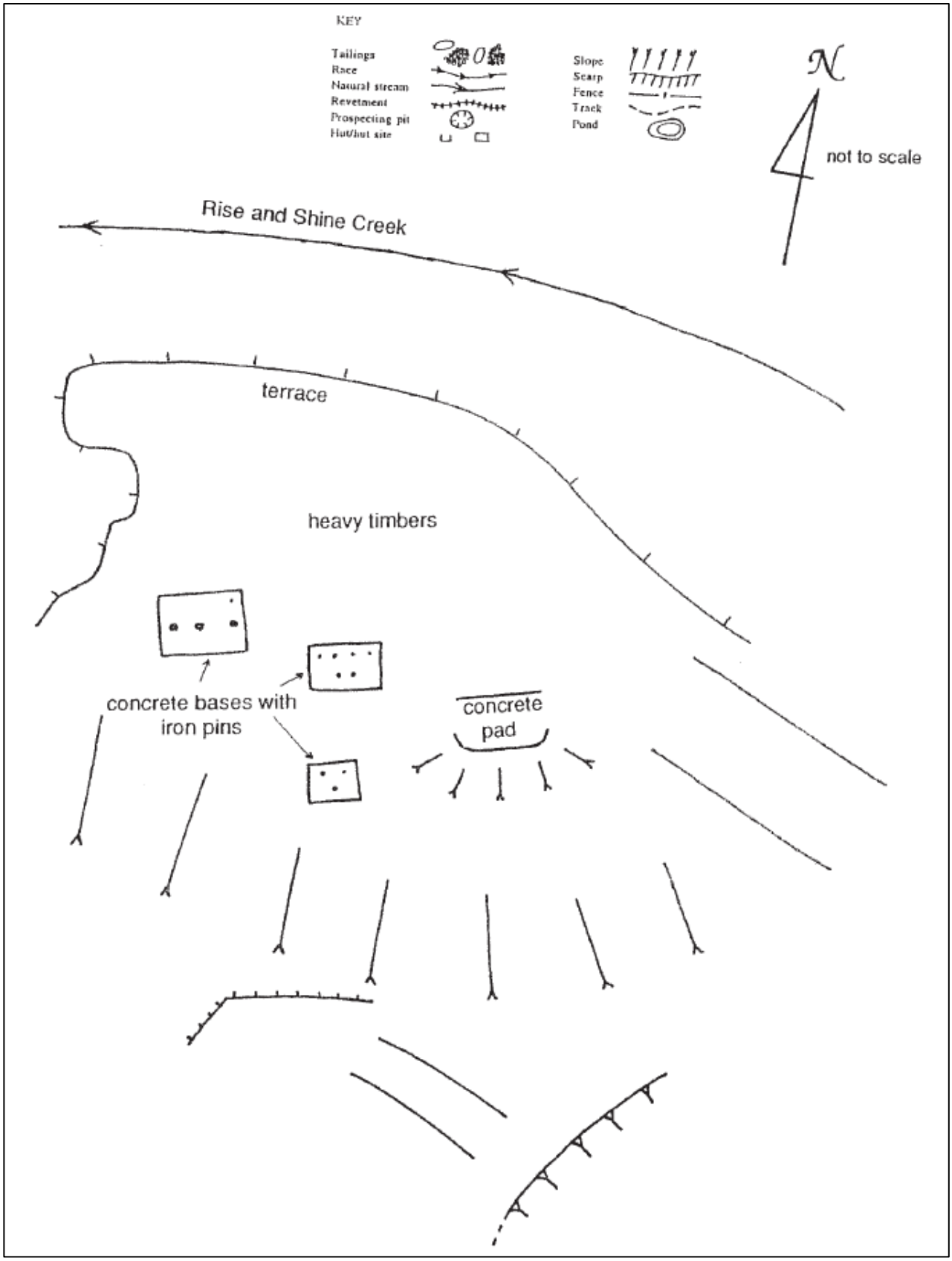


Figure 7 Plan of part Rise and Shine mine and battery (G41/277) (Hamel, 1993: Figure 18).

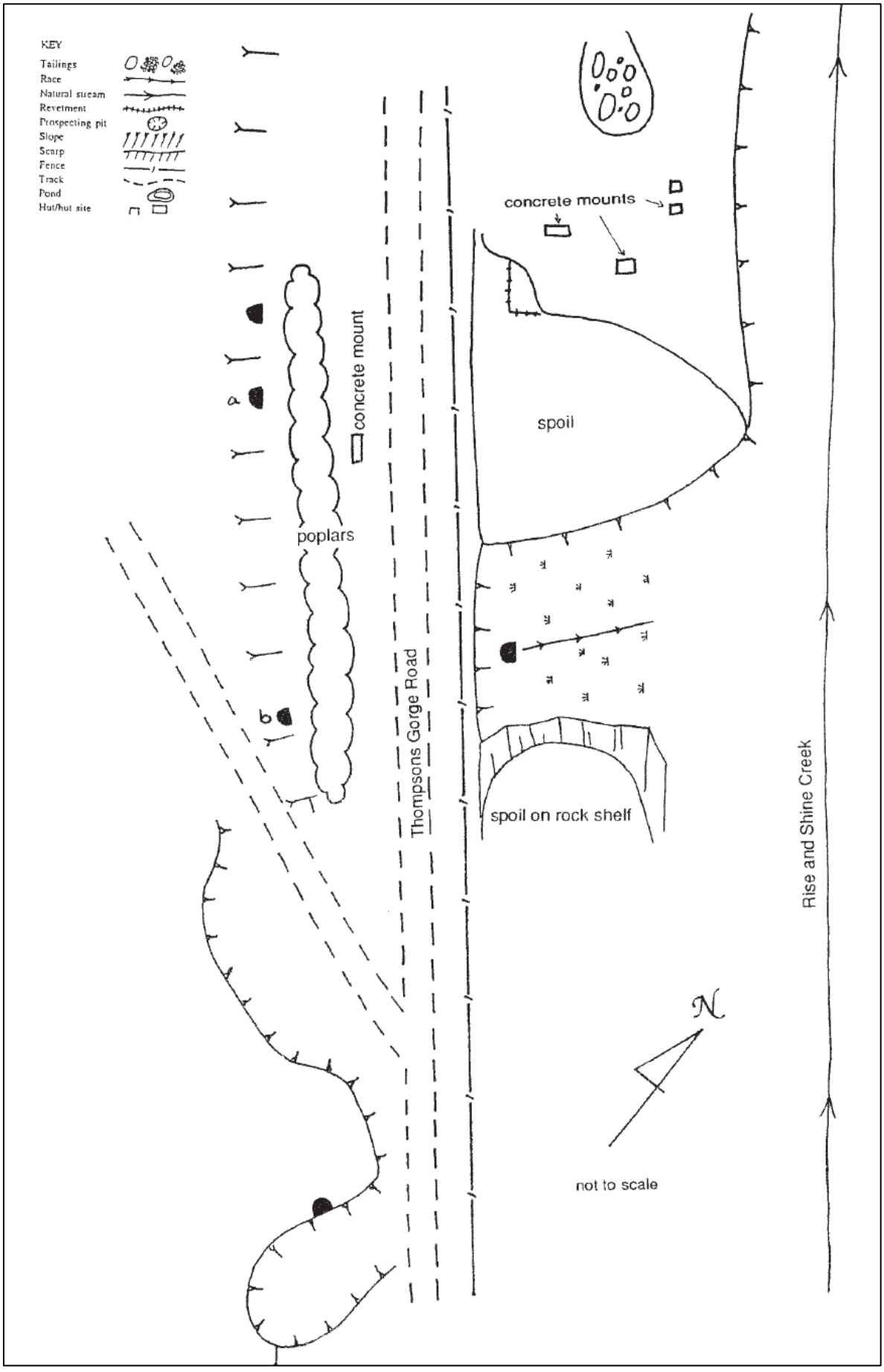


Figure 8 Plan of part Rise and Shine mine and battery (G41/277) (Hamel, 1993: Figure 16).

Figure 9 Aerial photograph showing the approximate extent of the G41/277 including the southeast extent of the Eureka Tramway. Approximate site extent based on recorded archaeological features, pedestrian survey, aerial photographs and LiDAR.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM (METRIC)

Metric map number **G41**
Metric map name Cromwell
Metric map edition 2000

NZAA METRIC SITE NUMBER (J41)/277
DATE VISITED 3/III/2005
SITE TYPE Mine/battery (Rise & Shine)
SITE NAME: MAORI
OTHER Rise and Shine mine & battery

S125/42

Grid Ref. Easting / / / **2 7 6** / / / Northing / / / **7 8 6** / / /
G.P.S. Easting 2 2 **2 7 6 8 9** Northing 5 5 **7 8 6 9 3**

Note revised Grid Ref on basis of G.P.S. reading

G.P.S. reading taken on battery site proper

2227867 5578525 Adit in sluice face
2227853 5578564 On road between adit behind trees & spoil on rock shelf
2227837 5578583 Machine foundation by road*
2227864 5578568 Adit in excavation at R & S
2227824 5578613 Amidst four concrete foundations
2227799 5578670 Top end of dam
2227753 5578728 Corner of dam breastworks
2227734 5578700 Corner of dam breastworks
2227731 5578651 South-eastern end of stone faced terrace (possible dam)
2227713 5578665 Adit c. 3 m deep at other end of stone-faced terrace
2227713 5578677 Adit
2227689 5578693 R & S (1930s) battery site **(N.B. source of GPS reading)**

R. Nichol, 50 Devon St, Picton

NBS/FN36

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S125
NZMS 1 map name St Bathans
NZMS 1 map edition 1st 1969

NZAA NZMS 1 SITE NUMBER S125/42
DATE VISITED August 1980
SITE TYPE Battery site
SITE NAME: MAORI
OTHER Rise and Shine Battery, Rise and Shine Creek.

Grid Reference Easting 3 2 0 7 0 0 Northing 3 8 2 7 0 0

1. Aids to relocation of site *(attach a sketch map)*

Follow farm road from Bendigo to Rise and Shine Creek. The site is on the true left of the creek just after the road crosses the creek.

2. State of site and possible future damage

Stamping battery has been removed.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Two small areas of concrete machinery foundations remain. One is approximately 50m downstream of the creek crossing, the other is 50m upstream.
The downstream concrete foundation consists of four concrete blocks with several large bolts protruding from them, as well as some smaller studs.
The upstream area consists of four concrete blocks in a clump and one a short distance away. Within the tailings at this site and mostly obscured by them is a stone building, 3 - 4m high. The top of the walls can be seen protruding from the tailings heap.
On the opposite side of the creek, downstream of the battery site a revetted roadway leads downstream on the true right. The track is exceedingly overgrown. It was found to finish at a point opposite the termination of another road on the true left which runs upstream from the area of the Come in Time Battery in Rise and Shine Creek. See S124/380.

4. Owner
Address Bendigo Station

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bendigo Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)* 2694/10 Visible

6. Reported by C.Jacomb and S.Easdale
Address Bendigo Survey
C.V.D.
Cromwell

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words

battery revetted road stone building

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

D	M	Type of site
A	K	Local environment today
A	C	Land classification
B	B	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: G41/584

SITE TYPE: Industrial

SITE NAME(s): Rise and Shine Water Race

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1319581 **Northing:** 5015301 **Source:** Handheld GPS

IMPERIAL SITE NUMBER: **METRIC SITE NUMBER:** G41/584

Finding aids to the location of the site

On hillside above southern side of Rise and Shine Creek.

Brief description

The Rise and Shine water race completed in 1865 by the Rise and Shine Syndicate.

Recorded features

Water race

Other sites associated with this site

SITE RECORD HISTORY	NZAA SITE NUMBER: G41/584

Site description

Updated 25/01/2019 (Field visit), submitted by meganlawrence , visited 14/01/2019 by Lewis, Julia; Scrivener, Phoebe; Lawrence, Megan; Jasmine Weston
Grid reference (E1319581 / N5015301)

The Rise and Shine water race was completed in 1865 by the Rise and Shine Syndicate. The lower extent of the race on the hillsides southwest of the Rise and Shine Creek was first recorded by Nichol and Wright (2006) and was revisited as part of an archaeological survey of the Thomsons Gorge area. This segment of the race was followed further east, for approximately 80 m, than initially recorded. Briden and Schmidt (2012) later recorded the upper extent of the water race around Mount Moka. This section, just over 1 m wide, was also revisited. This portion of the race is visible in, survey plan SO 1204, dating to 1909.

Condition of the site

Updated 25/01/2019 (Field visit), submitted by meganlawrence , visited 14/01/2019 by Lewis, Julia; Scrivener, Phoebe; Lawrence, Megan; Jasmine Weston

The lower and upper portions of the race exist in good condition. The upper section is covered in low grass and tussock while the lower section was overgrown in grass and shrub. Once over the Thomsons Saddle, the race has been damaged, likely through erosion, stock trampling, vegetation growth and the installation of Thomsons Gorge Road and the access road to the top of Mount Moka. As such, it was not possible to follow the race between its upper and lower extents

Statement of condition

Updated: 25/04/2019, Visited: 14/01/2019 - Fair - Some intact features, but others may be unclear or damaged

Current land use:

Updated: 25/04/2019, Visited: 14/01/2019 - Grazing, Road reserve

Threats:

Updated: 25/04/2019, Visited: 14/01/2019 - Stock trampling, Farming practices, Erosion, Road/ track formation or maintenance