

APPENDIX

P.2

HERITAGE ASSESSMENT AND STATEMENT OF HERITAGE IMPACT



Snowy 2.0 Main Works
Heritage Assessment and Statement of Heritage Impact

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Local Government Areas: Snowy Valleys and Snowy Monaro Regional



Snowy 2.0 Main Works
Heritage Assessment and Statement of Heritage Impact



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EXECUTIVE SUMMARY

Snowy Hydro Limited (Snowy Hydro) is proposing to build and operate Snowy 2.0, a project that will increase the pumped hydroelectric capacity within the existing Snowy Scheme by linking the Tantangara and Talbingo reservoirs with tunnels feeding a new underground power station.

Snowy 2.0 Main Works covers the major elements of Snowy 2.0, including the underground power station, access tunnels and access, power supply and communications infrastructure, as well as supporting infrastructure to enable construction. It also includes the operation of Snowy 2.0.

Snowy 2.0 is a Pumped Hydro Energy Storage (PHES) project that will increase the generation capacity of the Snowy Scheme by up to 50 per cent, with an additional 2,000 megawatts of generation. Snowy 2.0 has been declared State Significant Infrastructure and Critical State Significant Infrastructure (CSSI).

An Environmental Impact Statement (EIS) is being prepared to support an application seeking approval for the Main Project.

New South Wales Archaeology Pty Ltd has been engaged by Snowy Hydro Limited (Snowy Hydro) to conduct a Heritage Assessment and Statement of Heritage Impact for inclusion in the EIS.

The area in which the activity would be undertaken is described as the Mains Works project area (project area) and is located in the Kosciuszko National Park (KNP). New South Wales Archaeology Pty Ltd conducted the assessment of the Early Works, some areas of which are located within the Main Works project area.

This document describes the historic heritage assessment process, the statutory listed heritage and potential historic items and features in the project area, and the proposed impacts and harm. It sets out a series of management and mitigation measures for the consideration of the NSW Department of Planning Industry and Environment (DPIE).

The assessment of historic heritage and statement of heritage impact (HA&SOHI) of has been undertaken in accordance with the principles of the Australia ICOMOS Burra Charter (Australia ICOMOS 2013a) and its relevant Practice Notes (Australia ICOMOS 2013b, 2013c, 2017). It also complies with the Historical Archaeology Code of Practice (Heritage Council of NSW 2006) and the NSW Heritage Manual (1996) and its various updates and other guidelines published by the NSW Heritage Office (1996, 2001, 2009).

The assessment has included a review and synthesis of the historical context of the area. This has been based on primary and secondary sources, including historical maps and various published and unpublished sources (e.g. academic theses and consultant reports).

Historic Context

The Snowy Mountains has a rich history beginning with the early explorer-settlers in the 1820s, the establishment of pastoralism and summer grazing in the 1830s, the gold rush at Kiandra in 1859-60 and early scientific exploration. Thereafter, throughout the twentieth century the Snowy Mountains Scheme was built, scientific research developed further, and tourism and recreation promoted. Other lesser known activities in the high country include timber harvesting and milling, and Eucalyptus oil distilling.

Lobs Hole¹ (also known as Ravine) has been used since the early 1800s as a thoroughfare for the movement of stock, prospecting, grazing, horse breeding, settlement, refuge from the winters of Kiandra, horticulture, gardening and agriculture, copper mining and processing, recreation and so on. Lobs Hole was a popular recreational destination for Snowy Scheme workers, during and after the scheme's construction. Gold mining at Kiandra and surrounds continued into the 1900s. Gooandra and Tantangara have a long history of summer grazing and pastoralism.

Desktop research has included a review of all statutory and non-statutory heritage listings in and around the project area, as outlined below.

Statutory Heritage Listings

A search of the Australian Heritage Database (AHD) has been undertaken. Sixteen places are listed within the search area. Of these, two are Listed Places on a statutory register: *The Australian Alps National Parks and Reserves*; and the *Snowy Mountains Scheme*, both of which are on the National Heritage List (NHL) and, therefore, Matters of National Environmental Significance (MNES) to be addressed for the Main Works.

The remainder of places relate to Register of the National Estate (RNE) listings, of which four are Indicative Places for which a decision on listing was not made prior to closing the RNE, and nine are Registered Places. There are no places within the search area that are listed on the World Heritage List (WHL) or Commonwealth Heritage List (CHL).

¹ In this report the contemporary spelling *Lobs Hole* is used except for when a specific older name is referred to, such as for example, *Lobbs Hole Copper Mine*, when the original spelling is used.

A search has been made of the State Heritage Register. Three items on the State Heritage Register are near but outside the development footprint: Lake Eucumbene, Homestead, the Kiandra Courthouse/Chalet and Matthews Cottage (Kiandra).

The NSW Historic Heritage Information Management System (HHIMS) contains data and documents relating to heritage items on land managed by the NSW National Parks and Wildlife Service. HHIMS is the OEHS Section 170 Heritage and Conservation Register, which under Section 170 of the *NSW Heritage Act 1977* is the resource used for the protection and management of historic heritage within NSW National Parks. Of the 315 items on the HHIMS for KNP, nine are located within or near the project area. Of these, four are located within the project disturbance footprint at Lobs Hole Ravine. Given the location of these four items (all of which are a part of the Lobbs Hole Copper Mine complex) within or immediately adjacent to the Yarrangobilly River, they are unlikely to be impacted.

There are no heritage items listed in the Tumut Shire, Cooma Monaro Shire and Snowy River Shire Local Environment Plans (LEPs) in the disturbance footprint.

Non-Statutory Heritage Listings

Several historic sites listed in the Australian Heritage Database on the Register of the National Estate (Non-statutory archive) are in or near the project area. They are:

- Kiandra Courthouse/Chalet;
- Kiandra Mining Area;
- Kosciuszko National Park (1981 boundary);
- Snowy Mountains Scheme;
- Washington Hotel Ruin (Lobs Hole); *and*
- Lobbs Hole Copper Mine.

In addition to the items listed within KNP on the HHIMS, there are various other sites and potential historic items that are listed on an informal OEHS database, some of which occur within the project area.

A search of the National Trust of Australia (NSW) has been conducted. No items are within the project area.

The Kosciuszko Huts Association (KHA) provides the most comprehensive mapping currently available for potential heritage items and places of heritage interest in KNP and many occur in the project area.

Field survey, assessment and results

The project area has been divided into 28 survey areas for ease of assessment and presentation. The total assessment area measures 8,185.8 hectares. Some 564

historic items and potential historic items (inclusive of previous listed items) have been recorded during a comprehensive field assessment of these 28 survey areas. The survey areas include the current development footprint and areas of previous layout options.

The assessment of significance of the potential items and archaeological sites and potential relics has been undertaken in accordance with the NSW Heritage Criteria as set out in *Assessing Significance for Historical Archaeological Sites and Relics* (2009: 3). The thrust of the assessment has been to:

- implement a hierarchy of significance/contributory significance to encapsulate how items that don't meet the threshold individually do have value at a more holistic level;
- make sure any landscapes such as the Lobs Hole and Tantangara valleys are addressed within terms of overall impacts to the landscape as well as impacts to individual items.

Impact Assessment

As a result of refinements and changes to the development footprint, the majority of the potential heritage items and archaeological sites are now outside the project area. Of the 563 items recorded, 178 are located within the Main Project footprint.

Site specific management measures have been ascribed to each historic item or potential historic item located within or near to the project area. Where impacts are unavoidable, measures are outlined which will provide an appropriate level of impact mitigation, whether it be via detailed archival recording and further historic research and/or salvage excavations, if relevant.

The historic items recorded during the assessment are a part of various complexes ie the Lobs Hole complex, Kiandra mining complex and so on. On their own, many of the elements do not satisfy archaeological significance criteria. However, these combine to make up the historic landscapes which are place of local or greater significance for their historical, technological, social and research values.

Overall, it is anticipated that the project will have a generally low negative effect on the historical heritage significance of the pastoral and mining character of the region. However, within the development footprint itself a moderately negative effect would occur both to some individual historic items and, at Lobs Hole, to the historic landscape itself. Historic landscapes elsewhere would suffer temporary and reversible impacts.

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1. INTRODUCTION

1.1 THE PROJECT

Snowy Hydro Limited (Snowy Hydro) proposes to develop Snowy 2.0, a large-scale pumped hydro-electric storage and generation project which would increase hydro-electric capacity within the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme). Snowy 2.0 is the largest committed renewable energy project in Australia and is critical to underpinning system security and reliability as Australia transitions to a decarbonised economy. Snowy 2.0 will link the existing Tantangara and Talbingo reservoirs within the Snowy Scheme through a series of underground tunnels and a new hydro-electric power station will be built underground.

Snowy 2.0 has been declared to be State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) by the former NSW Minister for Planning under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and is defined in clause 9 of Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). CSSI is infrastructure that is deemed by the NSW Minister to be essential for the State for economic, environmental or social reasons. An application for CSSI must be accompanied by an environmental impact statement (EIS).

Separate applications are being submitted by Snowy Hydro for different phases of Snowy 2.0 under Part 5, Division 5.2 of the EP&A Act, including Exploratory Works for Snowy 2.0 (the Exploratory Works) and Main Works for Snowy 2.0 (the Main Works). In addition, an application under Part 5, Division 5.2 of the EP&A Act is also being submitted by Snowy Hydro for a segment factory that will make tunnel segments for both the Exploratory Works and Main Works phases of Snowy 2.0.

The first phase of Snowy 2.0, the Exploratory Works, includes an exploratory tunnel and portal and other exploratory and construction activities primarily in the Lobs Hole area of the Kosciuszko National Park (KNP). The Exploratory Works were approved by the former NSW Minister for Planning on 7 February 2019 as a separate project application to DPIE (SSI 9208).

This historical heritage assessment and statement of heritage impact (HA&SOHI) has been prepared to accompany an application and supporting EIS for the second phase of Snowy 2.0, which is to be known as the *Snowy 2.0 Main Works*. As the title suggests, this phase of the project covers the major construction elements of Snowy 2.0, including permanent infrastructure (such as the underground power station, power waterways, access tunnels, chambers and shafts), temporary construction infrastructure (such as construction adits, construction compounds and accommodation), management and storage of extracted rock material and

establishing supporting infrastructure (such as road upgrades and extensions, water and sewage treatment infrastructure, and the provision of construction power). Snowy 2.0 Main Works also includes the operation of Snowy 2.0.

Snowy 2.0 Main Works is shown in Figure 1. If approved, the Snowy 2.0 Main Works would commence before completion of Exploratory Works.

The Snowy 2.0 Main Works do not include the transmission works proposed by TransGrid (TransGrid 2018) that provide connection between the cableyard and the NEM. These transmission works will provide the ability for Snowy 2.0 to efficiently and reliably transmit additional renewable energy to major load centres during periods of peak demand, as well as enable a supply of renewable energy to pump water from Talbingo Reservoir to Tantangara Reservoir during periods of low demand. While the upgrade works to the wider transmission network and connection between the cableyard and the network form part of the CSSI declaration for Snowy 2.0 and Transmission Project, they do not form part of this application and will be subject to separate application and approval processes. This project is known as the HumeLink and is part of AEMO's Integrated System Plan.

With respect to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), Snowy Hydro referred Snowy 2.0 Main Works to the Commonwealth Minister for the Environment and Energy (DoEE) and, on a precautionary basis, nominated that Snowy 2.0 Main Works has potential to have a significant impact on MNES and the environment generally.

On 5 December 2018, Snowy 2.0 Main Works were deemed a controlled action by the Commonwealth Department of Environment and Energy (DoEE). It was also determined that potential impacts of the project will be assessed by accredited assessment under Division 5.2 of the EP&A Act. This accredited process will enable DPIE to manage the assessment of Snowy 2.0 Main Works, including the issuing of the assessment requirements for the EIS.

1.2 PROJECT LOCATION

Snowy 2.0 Main Works are within the Australian Alps, in southern NSW, about mid-way between Canberra and Albury. Snowy 2.0 Main Works is within both the Snowy Valleys and Snowy Monaro Regional local government areas (LGAs).

The nearest large towns to Snowy 2.0 Main Works are Cooma and Tumut. Cooma is located about 50 kilometres (km) south east of the project area (or 70 km by road from Providence Portal at the southern edge of the project area), and Tumut is located about 35 km north west of the project areas (or 45 km by road from Tumut 3 power station at the northern edge of the project area). Other townships near the project area include Talbingo, Cabramurra, Adaminaby and Tumbarumba. Talbingo

and Cabramurra were built for the original Snowy Scheme workers and their families, while Adaminaby was relocated in 1957 to make way for the establishment of Lake Eucumbene.

The location of Snowy 2.0 Main Works with respect to the region is shown in Figure 1.

The pumped hydro-electric scheme elements of Snowy 2.0 Main Works are mostly underground between the southern ends of Tantangara and Talbingo reservoirs, a straight-line distance of 27 km. Surface works will also occur at locations on and between the two reservoirs. Key locations for surface works include:

- *Tantangara Reservoir* - at a full supply level (FSL) of about 1,229 metres (m) to Australian Height Datum (AHD), Tantangara Reservoir will be the upper reservoir for the pumped hydro project and include the headrace tunnel and intake structure. The site will also be used for a temporary construction compound, accommodation camp and other temporary ancillary activities;
- *Marica* - this site will be used primarily for construction (including construction of vertical shafts to the underground power station (ventilation shaft) and headrace tunnel (surge shaft), and a temporary accommodation camp);
- *Lobs Hole* - the site will be used primarily for construction but will also become the main entrance to the power station during operation. Lobs Hole will provide access to the Exploratory Works tunnel, which will be refitted to become the main access tunnel (MAT), as well as the location of the emergency egress, cable and ventilation tunnel (ECVT), portal and associated services; *and*
- *Talbingo Reservoir* - at a FSL of about 546 m AHD, Talbingo Reservoir provides the lower reservoir for the pumped hydro-electric project and will include the tailrace tunnel and water intake structure. The site will also be used for temporary construction compounds and other temporary ancillary activities.

Works will also be required within the two reservoirs for the placement of extracted rock. Supporting infrastructure will include establishing or upgrading access tracks and roads and electricity connections to construction sites.

Most of the proposed pumped hydro-electric and temporary construction elements and most of the supporting infrastructure for Snowy 2.0 Main Works are located within the boundaries of KNP, although the disturbance footprint for the project during construction is less than 0.25% of KNP. Some of the supporting infrastructure (including sections of road upgrade, power and communications infrastructure) extends beyond the national park boundaries. These sections of infrastructure are primarily located to the east and south of Tantangara Reservoir. One temporary

construction site is located beyond the national park along the Snowy Mountains Highway about three kilometres east of Providence Portal (referred to as Rock Forest).

The project is described in more detail in Section 2.

1.3 PROJECT AREA

A project area for Snowy 2.0 Main Works has been identified that includes the elements of the project, including all construction and operational elements. The project area is shown on Figures 1 and 2. Key features of the project area are:

- the water bodies of Tantangara and Talbingo reservoirs, covering areas of 19.4 square kilometres (km²) and 21.2 km² respectively. The reservoirs provide the water to be utilised in the pumped hydro-electric scheme;
- major watercourses including the Yarrangobilly, Eucumbene and Murrumbidgee rivers and some of their tributaries;
- KNP, within which the majority of the project area is located. Within the project area, KNP is characterised by two key zones: upper slopes and inverted tree lines in the west of the project area (referred to as the 'ravine') and associated subalpine treeless flats and valleys in the east of the project area (referred to as the 'Plateau'); and
- farmland southeast of KNP at Rock Forest.

The project area is interspersed with built infrastructure including recreational sites and facilities, main roads as well as unsealed access tracks, hiking trails, farmland, electricity infrastructure, and infrastructure associated with the Snowy Scheme.

1.4 PROPONENT

Snowy Hydro is the proponent for Snowy 2.0. Snowy Hydro is an integrated energy business generating energy, providing price risk management products for wholesale customers and delivering energy to homes and businesses. Snowy Hydro is the fourth largest energy retailer in the NEM and is Australia's leading provider of peak, renewable energy.

1.5 PURPOSE OF THIS REPORT

This HA&SOHI supports the EIS for the Snowy 2.0 Main Works. It documents the heritage assessment methods and results, the initiatives built into the project design to avoid and minimise impacts, and the mitigation and management measures proposed to address any residual impacts not able to be avoided.

The specific objects of this assessment are to:

- to record all items of historic heritage value that exist within the development footprint;
- to assess the significance of historic heritage items in the project area;
- to assess the potential impacts of the project on historic heritage in the project area; and
- to formulate management measures for the protection of historic heritage items in the development footprint.

The project has been conducted and managed by Dr Julie Dibden (ANU: BA honours; PhD). The research and assessment have been undertaken by Julie Dibden, Dr Rebecca Parkes (ANU: BA honours; PhD), Tom Knight (ANU: BA honours, Masters) and Andrew Pearce (UNE: Bachelor of Archaeology and Paleoanthropology).

1.6 ASSESSMENT GUIDELINES AND REQUIREMENTS

This HA&SOHI has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for the Main Project, issued on 1 August 2019, as well as relevant governmental assessment requirements, guidelines and policies, and in consultation with the relevant government agencies.

To inform preparation of the SEARs, DPIE invited other government agencies to recommend matters to be addressed in the EIS. These matters were taken into account by the Secretary for DPIE when preparing the SEARs. Copies of government agency advice to DPIE were attached to the SEARs. The NSW Heritage Office provided advice that there were no heritage concerns identified for the project. Table 1 lists the matters in the SEARs relevant to this assessment and where they are addressed.

Table 1 The SEARs requirements for heritage.

Requirement	Section addressed
An assessment of the cultural and heritage impacts of the project, including impacts on:	
The listed heritage values of the Australian Alps National Parks and Reserves National Heritage Place;	Section 11 of this report and the Aboriginal

Requirement	Section addressed
	Cultural Heritage Assessment
The listed heritage values of the Snowy Mountains Scheme National Heritage Place;	Section 11 of this report
The cultural values of Kosciuszko National Park;	This report and the Aboriginal Cultural Heritage Assessment
Aboriginal and historic heritage items.	This report and the Aboriginal Cultural Heritage Assessment

1.7 RELATIONSHIP TO EXPLORATORY WORKS AND TRANSMISSION CONNECTION

The Exploratory Works includes an exploratory tunnel and portal, temporary construction compound, accommodation camp and temporary excavated rock stockpiles, all located in Lobs Hole, as well as barge access at the northern and southern end of Talbingo Reservoir and the construction and upgrade of road infrastructure. The primary purpose of the Exploratory Works is to gain an understanding of the rock conditions at the proposed location of the underground power station for Snowy 2.0. An exploratory tunnel is the key element proposed to gain this information.

The Exploratory Works is excluded from the scope of this historic heritage assessment as it was a separate assessment as part of the approval process for those works. Also excluded from the scope of this assessment are the transmission works proposed by TransGrid that provide connection between the cableyard (proposed to be located adjacent to the ECVT and the transmission network) and the NEM. All upgrade works to the wider transmission network and connection between the cableyard and the network do not form part of this application and are detailed in separate applications and approvals by TransGrid.

The impacts identified in this historic heritage assessment relate only to the Main Works phase of Snowy 2.0, not the Exploratory Works or Transmission Connection projects. However, where relevant, cumulative impacts with these separate projects have been considered and documented.

1.8 OTHER RELEVANT REPORTS

This historic heritage assessment has been prepared with reference to other technical reports that were prepared as part of the Snowy 2.0 Main Works EIS. The other relevant report referenced in this historic heritage assessment is listed below.

- Aboriginal cultural heritage assessment (NSW Archaeology 2019); and

- Landscape character and visual assessment (Spackman Mossop and Michaels 2019).

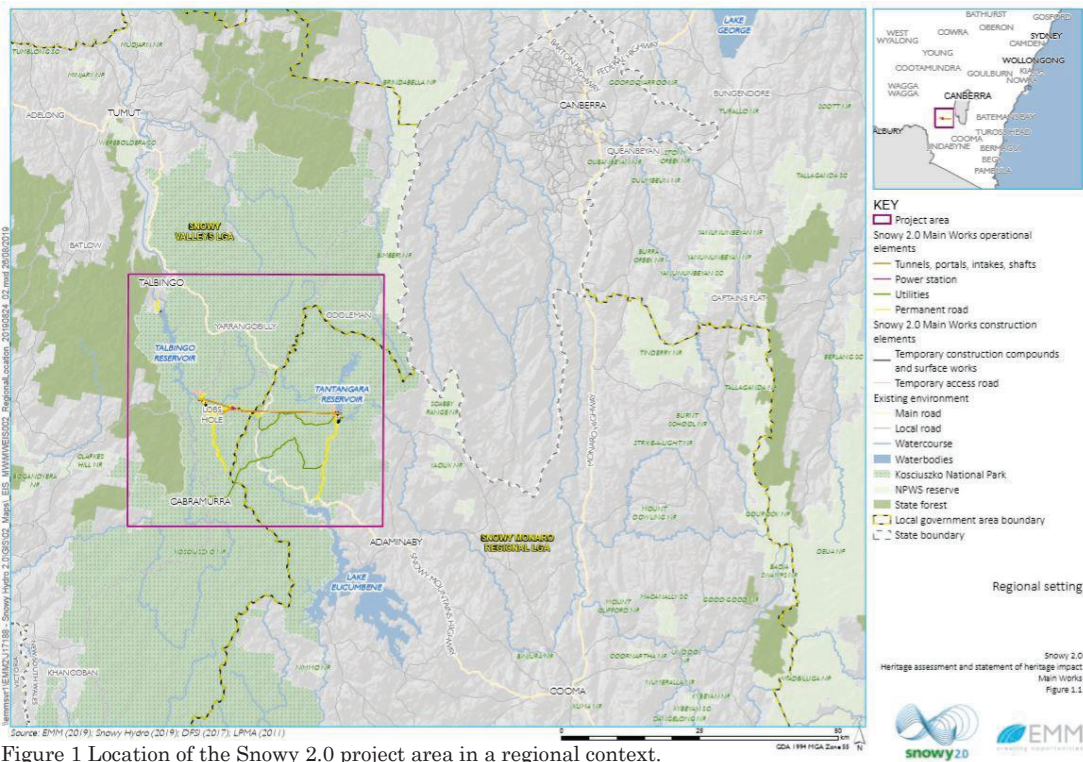


Figure 1 Location of the Snowy 2.0 project area in a regional context.

2. PROJECT DESCRIPTION – SNOWY 2.0

This chapter provides a summary of the Snowy 2.0 Main Works project. It outlines the functional infrastructure required to operate Snowy 2.0, as well as the key construction elements and activities required to build it. A more comprehensive detailed description of the project is provided in Chapter 3 (Project description) of the EIS, which has been relied upon for the basis of this technical assessment.

2.1 OVERVIEW OF SNOWY 2.0

Snowy 2.0 will link the existing Tantangara and Talbingo Reservoirs within the Snowy Scheme through a series of underground tunnels and a new hydro-electric power station will be built underground. An overview of Snowy 2.0 is shown on Figure 2, and the key project elements of Snowy 2.0 are summarised in Table 3.

Table 2 Overview of Snowy 2.0 Main Works.

Project element	Summary of the project
Project area	The project area is the broader region within which Snowy 2.0 will be built and operated, and the extent of which direct impacts from Snowy 2.0 Main Works are anticipated.
Permanent infrastructure	<p>Snowy 2.0 infrastructure to be built and operated for the life of the assets include the:</p> <ul style="list-style-type: none"> • intake, gate shafts and control buildings at Tantangara and Talbingo Reservoirs; • power waterway tunnels primarily comprising the headrace and tailrace tunnels and surge structure, inclined pressure shaft, penstock manifold and tailrace tunnel; • underground power station complex and vent shaft; • access tunnels (and tunnel portals) to the underground power station comprising the Main Access Tunnel (MAT) and Emergency egress, communication, and ventilation tunnel (ECVT); • establishment of a portal building and helipad at the MAT portal; • communication and power supply including continued use of the Lobs Hole substation; • cable yard adjacent to the ECVT portal to connect Snowy 2.0 to the NEM; • access roads and permanent bridge structures needed for operation and maintenance of Snowy 2.0 infrastructure; and • fish control structures on Tantangara Creek and near Tantangara Reservoir wall.

Project element	Summary of the project
Temporary infrastructure	<p>Temporary infrastructure required during the construction phase of the Snowy 2.0 Main Works are:</p> <ul style="list-style-type: none"> • construction compounds, laydown and ancillary facilities; • accommodation camps for construction workforce; • construction portals and adits to facilitate tunnelling activities • barge launch ramps; • water and wastewater management infrastructure (treatment plants and pipelines); and • temporary access roads.
Disturbance area	<p>The disturbance area is the extent of construction works required to build Snowy 2.0. The maximum disturbance area is about 1,680 hectares (ha), less than 0.25% of KNP. Parts of the disturbance area will be rehabilitated and landformed and other parts will be retained permanently for operation.</p>
Tunnelling method	<p>The primary tunnelling method for the power waterway is by tunnel boring machine (TBM), with portals and adits using drill and blast methods. Excavation for other underground caverns will also be via combinations of drill and blast, blind sink methods and/or raise bore techniques.</p>
Excavated rock management	<p>Excavated rock will be generated as a result of tunnelling activities and earthworks. The material liberated through these activities will be tested, stockpiled and either reused by the contractor (or NPWS), placed permanently within Tantangara or Talbingo reservoirs, used in final land forming and rehabilitation, or transported offsite.</p>
Construction water and wastewater management	<p>Water supply for construction will be from the two existing reservoirs (Talbingo and Tantangara) and reticulated via buried pipelines (within access roads). Raw water will be treated at accommodation camps and used as potable water.</p> <p>Water to be discharged (comprising process water, wastewater and stormwater) will be treated before discharge to the two existing reservoirs (Talbingo and Tantangara) as follows:</p> <ul style="list-style-type: none"> • treated process water will be reused onsite where possible to reduce the amount of discharge to reservoirs, however excess treated water will be discharged to the reservoirs; • collected sewage will be treated at sewage treatment plants to meet the specified discharge limits before discharge; and • stormwater will be captured and reused as much as possible.
Rehabilitation	<p>Rehabilitation of areas disturbed during construction and returning to pre-disturbance condition or as agreed with NPWS. This includes construction areas at Lobs Hole which comprise surplus cut materials that are required for the construction. Areas to be used by Snowy Hydro in the long-term may be re-shaped and rehabilitated to maintain access and operational capabilities (eg intakes and portal entrances)</p>
Construction workforce	<p>The construction workforce for the project is expected to peak at around 2,000 personnel</p>

Project element	Summary of the project
Operational life	The operational life of the Project is estimated to be 100 years
Operational workforce	The operational workforce is expected to be 8 -16 operational and maintenance staff
Hours of operation	Construction of Snowy 2.0 will be 24/7 Operation of Snowy 2.0 will be 24/7
Capital investment value	Estimates to be \$4.6 billion

2.2 CONSTRUCTION OF SNOWY 2.0

A number of construction activities will be carried out concurrently, and across a number of different sites. Specific details on these activities as well as an indicative schedule of construction activities is provided in Chapter 3 (Project description) of the EIS. This section summarises the key construction elements of the project.

Table 4 provides an overview of the construction elements, their purpose and location within the project area.

Table 3 Snowy 2.0 construction elements.

Construction element	Purpose	Location
Construction sites	<p>Due to the remoteness of Snowy 2.0, construction sites are generally needed to:</p> <ul style="list-style-type: none"> • Provide ancillary facilities such as concrete batching plants, mixing plants and on-site manufacturing; • Store machinery, equipment and materials to be used in construction; • Provide access to underground construction sites; and • Provide onsite accommodation for the construction workforce. 	Each construction site needed for Snowy 2.0 is shown on Figures 2 - 8.
Substations and power connection	One substation is required to provide permanent power to Snowy 2.0, at Lobs Hole. This substation is proposed as part of a modification of Exploratory Works with a capacity of 80 mega volt amp (MVA). It will continue to be used for Main Works, however, requires the establishment of further power supply cables to provide power to the work sites and TBM at Tantangara, as well as Talbingo, in particular to power the TBMs via the MAT, ECVT, Talbingo and Tantangara portals.	The supporting high voltage cable route mostly follows access roads to each of the work sites.

Construction element	Purpose	Location
Communications system	Communications infrastructure will connect infrastructure at Tantangara and Talbingo reservoirs to the existing communications system at the Tumut 3 power station (via the submarine communications cable in Talbingo Reservoir established during Exploratory Works) and to Snowy Hydro's existing communications infrastructure at Cabramurra.	The cable will be trenched and buried in conduits within access roads. Crossing of watercourses and other environmentally sensitive areas will be carried out in a manner that minimises environmental impacts where possible, such as underboring.
Water and wastewater servicing	Drinking water will be provided via water treatment plants located at accommodation camps. Water for treatment will be sourced from the nearest reservoir. There are three main wastewater streams that require some form of treatment before discharging to the environment, including: <ul style="list-style-type: none"> • Tunnel seepage and construction wastewater (process water); • Domestic sewer (wastewater); and • Construction site stormwater (stormwater). 	Utility pipelines generally follow access roads. Water treatment plants (drinking water) will be needed for the accommodation camps and will be located in proximity. Wastewater treatment plants will similarly be located near accommodation camps. Process water treatment plants will be at construction compounds and adits where needed to manage tunnel seepage and water during construction.
Temporary and permanent access roads	Access works are required to: <ul style="list-style-type: none"> • provide for the transport of excavated material between the tunnel portals and the excavated rock emplacement areas; • accommodate the transport of oversized loads as required; and • facilitate the safe movement of plant, equipment, materials and construction workers into and out of construction sites. The access road upgrades and establishment requirements are shown on Figures 2 to 8. These roads will be used throughout construction including use of deliveries to and from site and the external road network.	The access road upgrades and establishment requirements are shown across the project area. Main access and haulage to site will be via Snowy Mountains Highway, Link Road and Lobs Hole Ravine Road (for access to Lobs Hole), and via Snowy Mountains Highway and Tantangara Road (for access to Tantangara Reservoir) (see Figure 2.

Construction element	Purpose	Location
Excavated rock management	<p>Approximately 9 million m³ (unbulked) of excavated material will be generated by the Main Works construction and require management.</p> <p>The strategy for management of excavated rock will aim to maximise beneficial reuse of materials for construction activities. Beneficial re-use of excavated material may include use for road base, pad establishment, selected fill and tunnel backfill and rock armour as part of site establishment for construction areas.</p> <p>Excess excavated material that cannot be re-used during construction will be disposed of within Talbingo and Tantangara reservoirs, used in permanent rehabilitation of Lobs Hole, or transported out of the National Park for on-land disposal if required.</p>	Placement areas are shown on Figures 4 and 7.
Barge launch facilities	Barge launch facilities on Talbingo Reservoir will have already been established during Exploratory Works for the placement of the submarine communications cable and will continued to be used for Main Works for construction works associated with the Talbingo intake structure. The Main Works will require the establishment of barge launch facilities on Tantangara Reservoir to enable these similar works (removal of the intake plug).	Barge launch sites are shown on Figures 3 and 7.
Construction workforce	The construction workforce will be accommodated entirely on site, with a 20 day on 10 day off FIFO/DIDO roster. No private vehicles will be permitted, and the workforce bused to and from site.	Access to site will be via Snowy Mountains Highway

The key areas of construction are shown on Figures 2 – 8 and can be described across the following locations:

- Talbingo Reservoir – Talbingo Reservoir provides the lower reservoir for the pumped hydro-electric project and will include the tailrace tunnel and water intake structure. The site will also be used for temporary construction compounds and other temporary ancillary activities;
- Lobs Hole – this site will be used primarily for construction (including construction of vertical shafts to the underground power station (ventilation shaft) and headrace tunnel (surge shaft), underground tailrace surge shaft and a temporary accommodation camp);

- Marica – the site will be used primarily for construction. Lobs Hole will provide access to the Exploratory Works tunnel, which will be refitted to become the main access tunnel (MAT), as well as the location of the emergency egress, cable and ventilation tunnel (ECVT), portal and associated services;
- Plateau – the land area between Snowy Mountains Highway and Tantangara Reservoir is referred to as the Plateau. The Plateau will be used to access and construct a utility corridor and construct a fish weir on Tantangara Creek;
- Tantangara Reservoir – Tantangara Reservoir will be the upper reservoir for the pumped hydro project and include the headrace tunnel and intake structure. The site will also be used for a temporary construction compound, accommodation camp and other temporary ancillary activities; and
- Rock Forest – a site to be used temporarily for logistics and staging during construction. It located beyond the national park along the Snowy Mountains Highway about 3 km east of Providence Portal.

During the construction phase, all work sites will be restricted access and closed to the public. This includes existing road access to Lobs Hole via Lobs Hole Ravine Road, and access to Tantangara Reservoir via Tantangara Road. Restrictions to water-based access and activities will also be implemented for public safety and to allow safe construction of the intakes within the reservoirs.

A key construction element for the project is the excavation and tunnelling for underground infrastructure including the power station, power waterway (headrace and tailrace tunnels) and associated shafts. The primary methods of excavation are shown in Figure 9 with further details on construction methods described in Appendix D of the EIS.

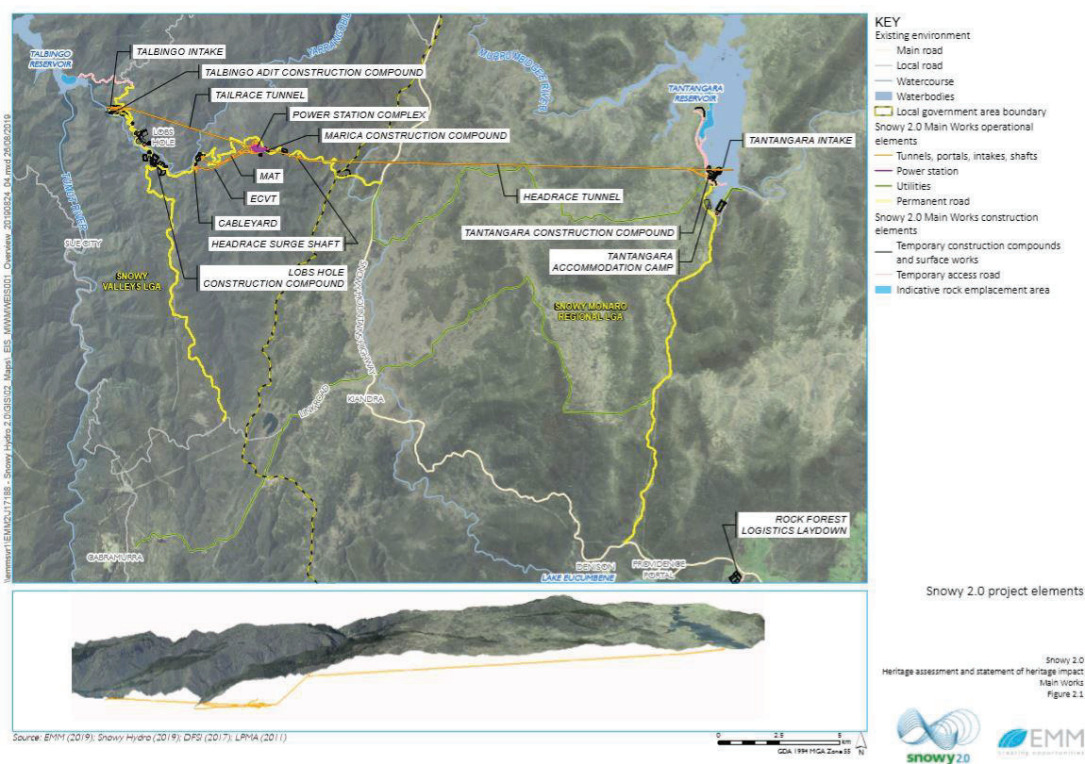


Figure 2 An overview of Snowy 2.0.

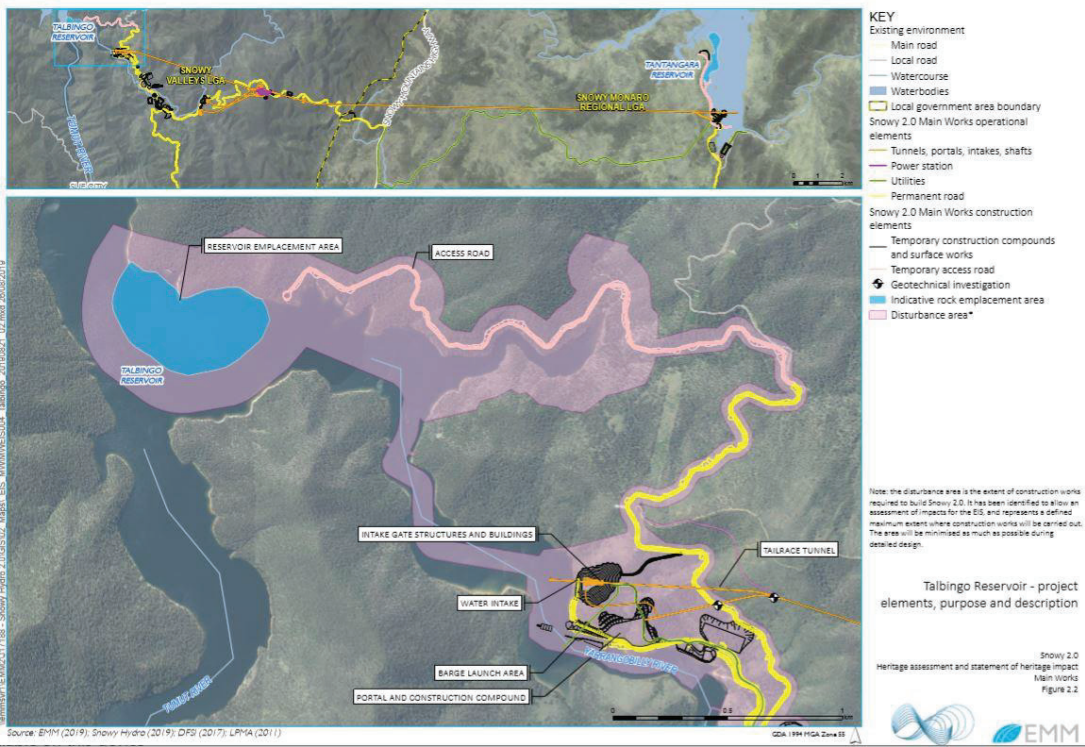


Figure 3 Snowy 2.0 construction areas – Talbingo Reservoir.

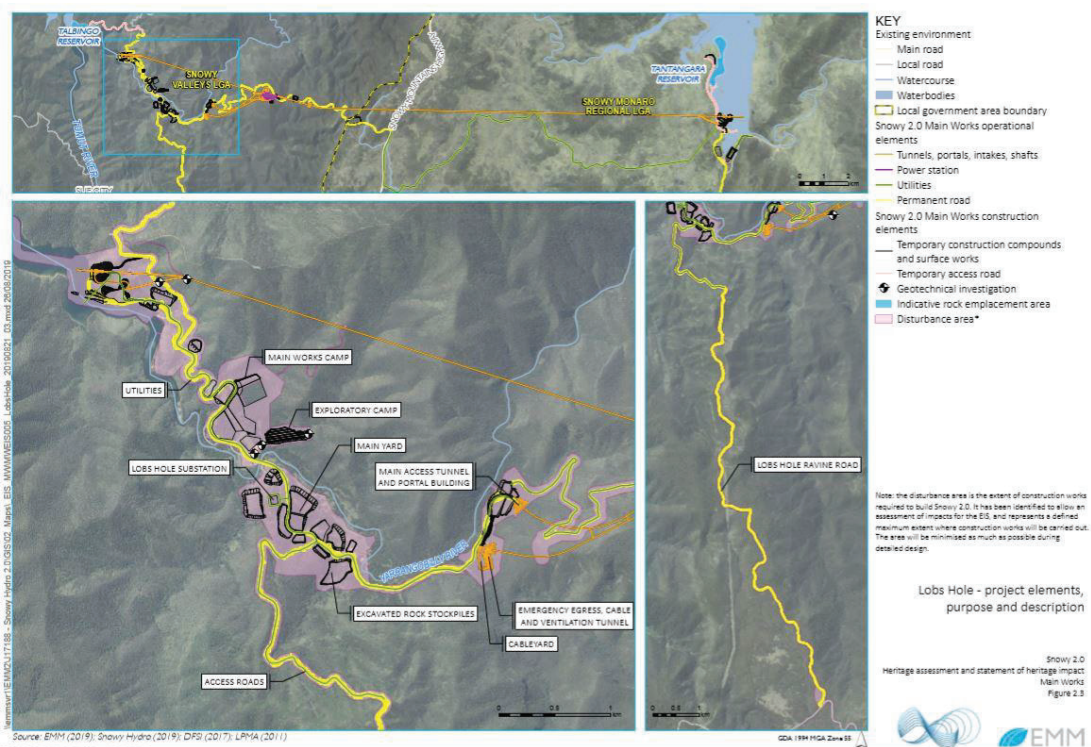


Figure 4 Snowy 2.0 construction areas – Lobs Hole.

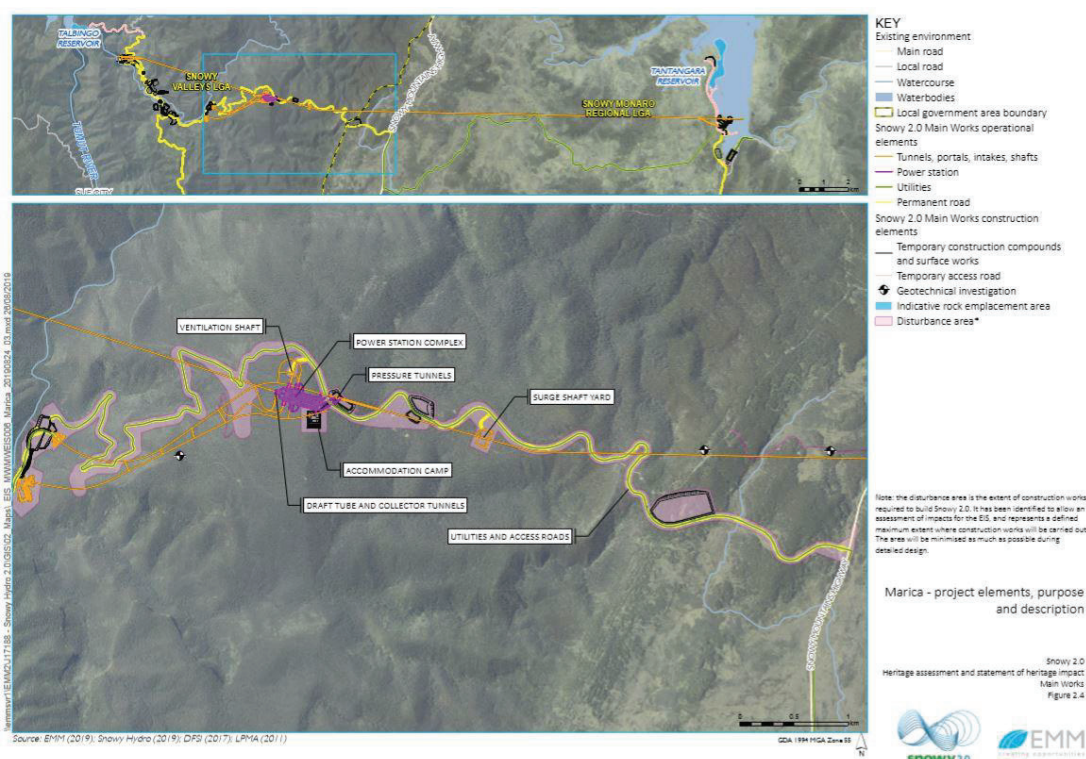


Figure 5 Snowy 2.0 construction areas – Marica.

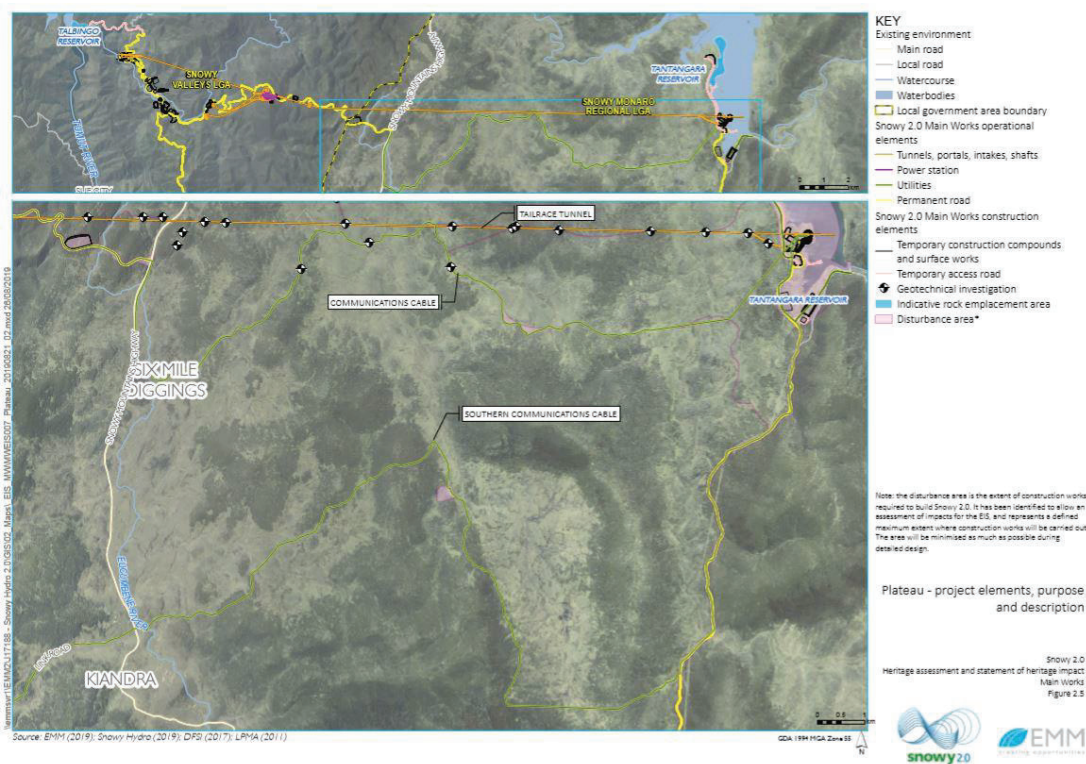


Figure 6 Snowy 2.0 construction areas – Plateau.

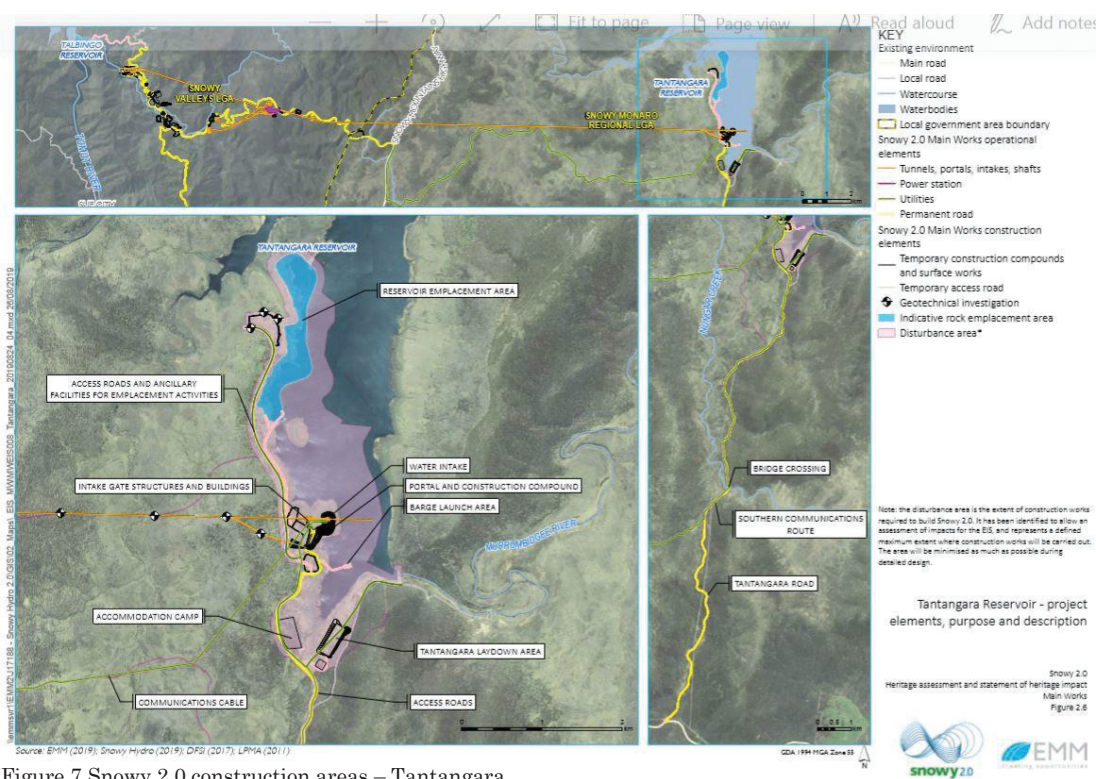


Figure 7 Snowy 2.0 construction areas – Tantangara.

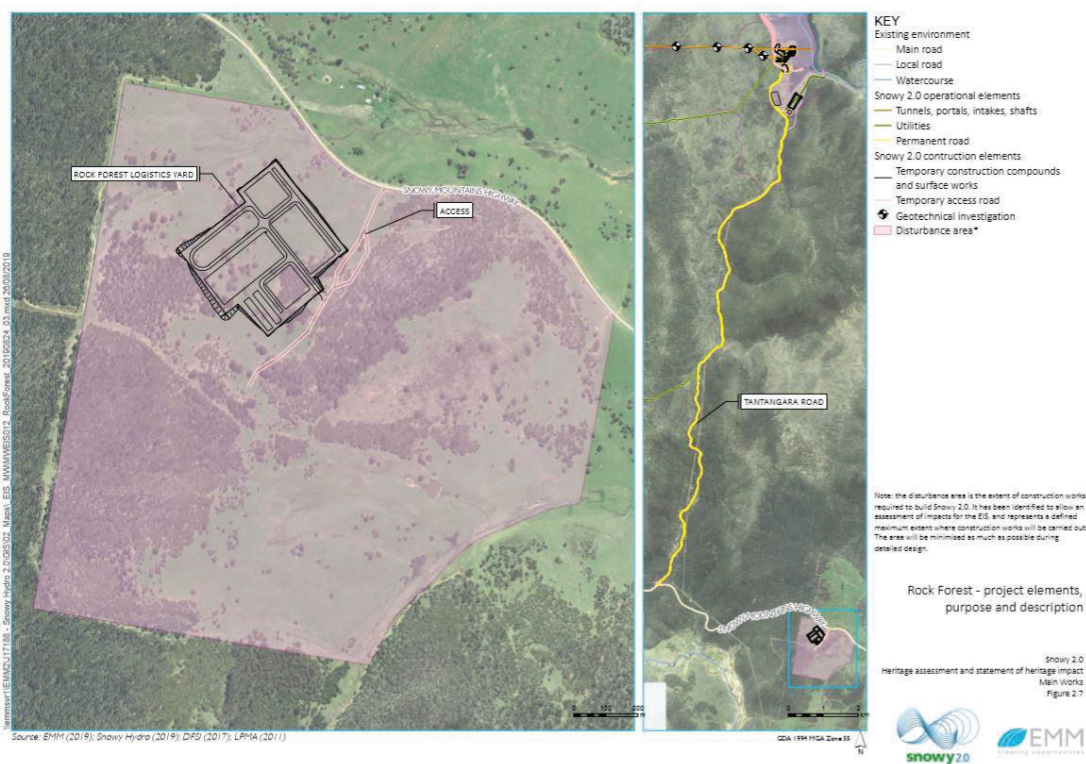


Figure 8 Snowy 2.0 construction areas – Rock Forest.

KEY
Tunnelling method
— Drill and blast
— TBM 1
— TBM 2
— TBM 3
→ Tunnelling direction
Existing environment
Main road
Local road
Watercourse
Waterbodies

TBM WILL INITIALLY EXCAVATE THE ECVT TO THE POWER STATION COMPLEX. THE TBM WILL THEN BE TRANSPORTED TO THE TAILRACE TUNNEL AND WILL EXCAVATE EASTWARDS UNTIL THE POWER STATION COMPLEX.

TBM WILL START AT THE TANTANGARA ADIT TO EXCAVATE THE HEADRACE TUNNEL IN A WESTWARD DIRECTION. IT WILL FINISH AT THE UPSTREAM SURGE SHAFT.

TBM WILL START AT THE EXPLORATORY PORTAL (ESTABLISHED DURING EXPLORATORY WORKS) AND EXCAVATE THE MAT TO THE POWER STATION. IT WILL CONTINUE PAST THE POWER STATION AND EXCAVATE THE INCLINED PRESSURE SHAFT AND FINISH AT THE UPSTREAM SURGE TANK.

Source: EMM (2019); Snowy Hydro (2019); DFS (2017); LPHM (2011)

Primary excavation methods – drill and blast and tunnel boring machine

Snowy 2.0
Heritage assessment and statement of heritage impact
Kean Vioris
Figure 2.8

snowy2.0
EMM
Creating opportunities

New South Wales Archaeology Pty Ltd
September 2019
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3. LEGISLATIVE CONTEXT

3.1 COMMONWEALTH LEGISLATION

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters of national environmental significance (MNES) including:

- o world heritage properties;
- o national heritage places;
- o Ramsar wetlands of international importance;
- o nationally threatened species and ecological communities;
- o migratory species;
- o Commonwealth marine areas;
- o the Great Barrier Reef Marine Park;
- o nuclear actions (including uranium mining); and
- o a water resource, in relation to coal seam gas development and large coal mining development.

MNES relevant to Exploratory Works are nationally threatened species and ecological communities and national heritage places. Two national heritage places occur within the project area: *Australian Alps National Parks and Reserves* and *The Snowy Mountains Scheme*.

3.2 NEW SOUTH WALES LEGISLATION

3.2.1 NSW *Environmental Planning and Assessment Act 1979* and its Regulation

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the primary legislation regulating environmental planning and assessment in NSW. Part 5 of the EP&A Act establishes the assessment and approval regime for State significant infrastructure (SSI) and critical State significant infrastructure (CSSI).

Snowy 2.0 has been declared CSSI by the NSW Minister for Planning under the provisions of the EP&A Act and is defined in Clause 9 of Schedule 5 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

The EP&A Act also establishes the framework for cultural heritage values to be formally assessed in the planning and development consent process. The EP&A Act requires that environmental impacts are considered before land development; this

includes impacts on cultural heritage items and places as well as archaeological sites and deposits.

The EP&A Act requires that local governments prepare planning instruments, such as Local Environment Plans (LEPs) and Development Control Plans (DCPs) in accordance with the EP&A Act, to provide guidance on the level of environmental assessment. This includes identification of heritage items, as listed on the heritage schedules of an LEP. Where a project is being assessed as CSSI, approval by the relevant council is not required but the items require assessment and management if they are affected by a proposal. Heritage items listed on the LEPs have been considered in this assessment.

3.2.2 Heritage Act 1977

The *Heritage Act 1977* is the primary piece of State legislation affording protection to items of environmental heritage (predominantly cultural) in NSW. Under the Heritage Act, ‘items of environmental heritage’ include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values.

Items that are formally assessed to be of State significance and are listed on the State Heritage Register (SHR), established under Part 3A of the Heritage Act. Items listed on the SHR are given automatic protection under the Heritage Act against any activities that may damage an item or affect its heritage significance.

Under Section 170 of the Heritage Act, government agencies must establish and keep a register that includes all items of environmental heritage that have been identified by the agency, or that are listed on the SHR, an environmental planning instrument, or which may be subject to an interim heritage order that are owned, occupied or managed by that government body.

The Heritage Division also keeps a register called the State Heritage Inventory (SHI) of heritage items that are listed on Schedule 5 of local planning instruments and most Section 170 registers and makes them available online.

These registers provide a list of known heritage items to be considered during this assessment.

Part 6 of the Heritage Act provides protection for ‘relics’, regardless of their listing status. It applies to all land in NSW that is not included in the SHR. Section 4(1) of the Heritage Act (as amended 2009) defines a ‘relic’ as follows:

A “relic” means any deposit, artefact, object or material evidence that:

- a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and
- b) is of State or local heritage significance.

Section 139 (1) of the Heritage Act states that:

“A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.”

Approval under the Heritage Act is not applicable for projects assessed as CSSI. However, where unanticipated relics are discovered, notification to the Heritage Council is regulated under Section 146 of the Heritage Act.

Section 146 Notification of discovery of relic:

A person who is aware or believes that he or she has discovered or located a relic (in any circumstances, and whether or not the person has been issued with a permit) must:

- c) within a reasonable time after he or she first becomes aware or believes that he or she has discovered or located that relic, notify the Heritage Council of the location of the relic, unless he or she believes on reasonable grounds that the Heritage Council is aware of the location of the relic, and
- d) within the period required by the Heritage Council, furnish the Heritage Council with such information concerning the relic as the Heritage Council may reasonably require.

The Heritage Act identifies the category of ‘works’, which refers to historical infrastructure, and is viewed as separate to that of archaeological ‘relics’ under the Heritage Act. ‘Works’ may be buried, and are therefore archaeological in nature, but exposing a ‘work’ does not trigger reporting obligations under the Heritage Act unless it is of demonstrable significance.

3.2.3 National Parks and Wildlife Regulations 2009

Under the NPW Act and Regulations - buildings and structures are protected in National Parks if older than 25 years:

There is protection for any deposit, object or material evidence older than 25 years under the *National Parks and Wildlife Regulations 2009*. Clause 16(3) (d) states that.

- 3. A person must not in a park.

(d) interfere with or remove or assist in the removal of any deposit, object or material evidence relating to the settlement or occupation of New South Wales or a part of New South Wales (not being Aboriginal settlement or occupation) if the deposit, object or material evidence is more than 25 years old at the date of the interference or removal.

It is important to note that Section 16(3) (d) applies to buildings and structures as they are material evidence, and which relate to European settlement, not Aboriginal settlement. Aboriginal cultural heritage is protected elsewhere in the NPW Regulation 2009 and in the *National Parks and Wildlife Act 1974*.

3.3 IMPLICATIONS OF A LISTING

Listing on statutory registers provides a basis under which the item or place is protected, and change is managed through project approval. Statutory listings provide legal protection for heritage items under the legislation outlined above. Statutory and non-statutory registers have been reviewed.

Statutory registers reviewed as a part of this assessment include:

- National Heritage list (NHL) - the register is made under the EPBC Act.
- Commonwealth Heritage List (CHL) - the register is made under the EPBC Act.
- SHR - this register is made under Part 3A of the Heritage Act. Items on the SHR undergo a rigorous assessment process and must reach a high significance threshold to be included. Inclusion on the SHR is directed by the Minister for Heritage.
- Heritage and Conservation Register (s170 register) - this register is made under Section 170 of the Heritage Act. It is a register of heritage items that are owned or managed by state government authorities. Items on the s170 register may also be listed on other registers. Demolition, change to fabric and change of ownership require notification to the Heritage Council of NSW.
- Schedule 5 of the Tumut Shire, Snowy River Shire and Cooma Monaro Shire LEPs. The EP&A Act sets the provisions for the making of LEPs. Most LEPs are prepared to a standard template, which includes environmental heritage in Schedule 5 (the heritage schedule). Where an item is included in the heritage schedule, development applications must include an assessment of impacts to the item. Where a project is being assessed as CSSI, approval by the relevant council is not required but the items require assessment and management if they are affected by a proposal.
- State Heritage Inventory (SHI), which was cross-checked with Schedule 5 of the LEPs and the s170 register. The SHI is not a single statutory register, but

a central collection of listed statutory heritage items maintained by the Heritage Division.

Non-statutory listing is an acknowledgment of a site's or place's importance to sections of the community. Listings on such registers do not place legal requirements on development but nevertheless influence the future of such listed items. Non-statutory registers reviewed as a part of this assessment include:

- National Trust of Australia, NSW (NT) - the NT is made up of autonomous state chapters. Each chapter is a community-based and non-government organisation, with a mandate to conserve and promote Australia's natural and cultural heritage. Classification by NT is a strong acknowledgment of heritage significance and while statutory constraints are not applicable, classification offers protection through visibility and community action.
- Register of the National Estate (RNE) - the RNE is an archived list of heritage items that were protected under the now repealed Commonwealth *Heritage Commission Act 1975*, which was replaced by the EPBC Act. While many items were transferred from the RNE to the NHL or CHL, those that were not remain on the RNE as an indication of their heritage value.

4. THE ENVIRONMENT AND LANDSCAPE

The project area is located primarily within Kosciuszko National Park (KNP) which includes 673,542 hectares of the Snowy Mountains and surrounding slopes and lowlands (DEC 2006). KNP straddles the Great Dividing Range. Altitude varies from 213 m asl in the valley of the Snowy River to 2,229 m asl at the summit of Mount Kosciuszko. The park is of national and state conservation significance as it (NPWS 2000):

- protects significant water catchments;
- contains all of NSW's alpine areas and a large portion of its sub-alpine areas;
- protects a variety of habitats and threatened flora and fauna communities;
- contains a wide variety of significant topographical and geomorphological features, ranging from semi-arid to alpine environments;
- provides an educational and scientific resource of national and international importance;
- contains extensive archaeological resources, including Aboriginal campsites, stone arrangements, quarries, burial places and ceremonial grounds; and
- has a rich historic heritage relating to summer grazing, mining, skiing and the Snowy Mountains Scheme.

4.1 ENVIRONMENTAL CONTEXT

Geology

The project area is in the Lachlan Orogeny (Fold Belt) in South-east NSW. The Lachlan Orogeny comprises Ordovician to Devonian aged sedimentary, igneous and metamorphic rocks that developed during several orogenic periods associated with extensive faulting to form major geotectonic structures (Snowy Hydro Limited 2017b).

The project area is dominated by lithological units and structures of the Lachlan Fold Belt, a cratonic structure formed from the accretion of tectonic subduction zones from the east (Bishop 1988). The evolution of the fold belt in relation to the project area is comprehensively described in Wyborn (1977; 1990; 1994) and the following is largely derived from those texts, unless indicated otherwise.

During the Ordovician, two deep marine sedimentary basins were separated by a northeast trending belt of volcanics. The sedimentary basins are represented within the project area by the sandstone turbidites and conglomerate units spanning a large area of the north west project area and to the east of Tantangara Reservoir.

Remnants of the volcanic belt can be seen today as a trend of basalt units bearing north east in the centre of the project area (Figure 10).

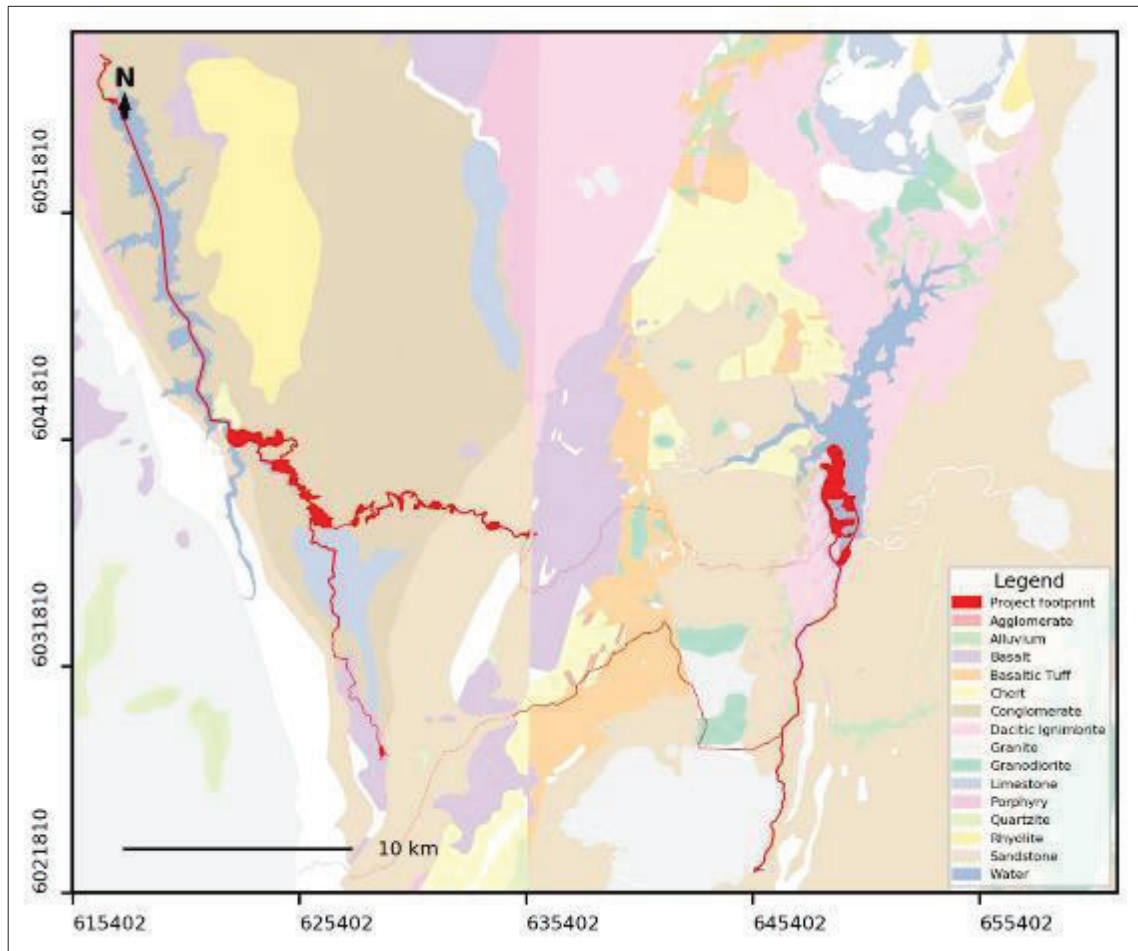


Figure 10 Lithology within the project area compiled from the Wagga Wagga (Adamson & Loudon, 1966) and Canberra (Strusz 1971) 1:250 000 sheets to the left and right of the image respectively.

Deposition ceased by the early Silurian and regional low temperature-high pressure metamorphism commenced. Major strike-slip fault systems developed along the Ordovician volcanics forming basins and intervening shelves. The major fault zones occurring within the project area include the Tumut Ponds and Indi fault zones. Emplacements of S-type granites (derived from sedimentary source rocks) occurred during the Silurian and Devonian and cover a large area of the south west corner of the project area; emplacements also occur at the central southern edge and the northern half of the eastern area, although these are technically adamellites, having too little quartz for classification as granite.

Volcanic activity occurred during the Devonian with intrusion of minor I-type granites, expressed as small equant units of granodiorite scattered around the east.

Extrusive vulcanism is represented by ignimbrites (pyroclastic ash deposits) around the north of Tantangara Reservoir.

Isolated areas of deposition recommenced during the Devonian, expressed as minor lithic sandstone units immediately north east of Tantangara Reservoir. More extensively, limestones were also deposited with three formations occurring within the project area. The Lick Hole Limestone occurs in the central south west; the Yarrangobilly Limestone in the central north, and the Cooleman Limestone in the north east corner. All but the Lick Hole Limestone is karstic with extensive cave systems, gorges and rising streams (Spate 2004).

The region was denuded to a channel-incised plain prior to the Tertiary (Oilier 1982), most likely in two to three episodes during the Late Permian–Early Triassic, the mid-Cretaceous, and possibly the Cenozoic (Kohn *et al.* 1999). During the Tertiary, two phases of basaltic volcanic eruptions occurred, and these have been temporally related to pulses of highland uplift (Jones & Veever's 1982 in (Jones & Veever's 1982 in Bishop 1988).

During the Last Glacial Maximum (LGM) four glacier advances are known to have occurred (Table 4) (Barrows *et al.* 2001). Glacial activity was restricted to a small area approximately 50 kilometres to the south and so did not impact directly on the surface morphology of the project area.

Table 4 Timing of glacial advances in mainland Australia (Barrows *et al.* 2001).

<i>Glacial advance</i>	<i>Age</i>
Snowy River	59,300±5400
Headly Tarn	32,000±2500
Blue Lake	19,100±1600
Mt. Twynam	16,800±1400

Physiography

The project area spans three physiographic regions (Figure 11). The Australian Alps are associated with the higher elevations spanning the larger eastern portion of the study area. To the west, the Hume Slopes are associated with a broad valley draining towards the northwest, and the East Victorian Uplands are associated with the rises in the southeast (Pain *et al.* 2011). East of the project area, the Australian Alps are separated from a dissected coastal plain by an erosional escarpment (Oilier 1982).

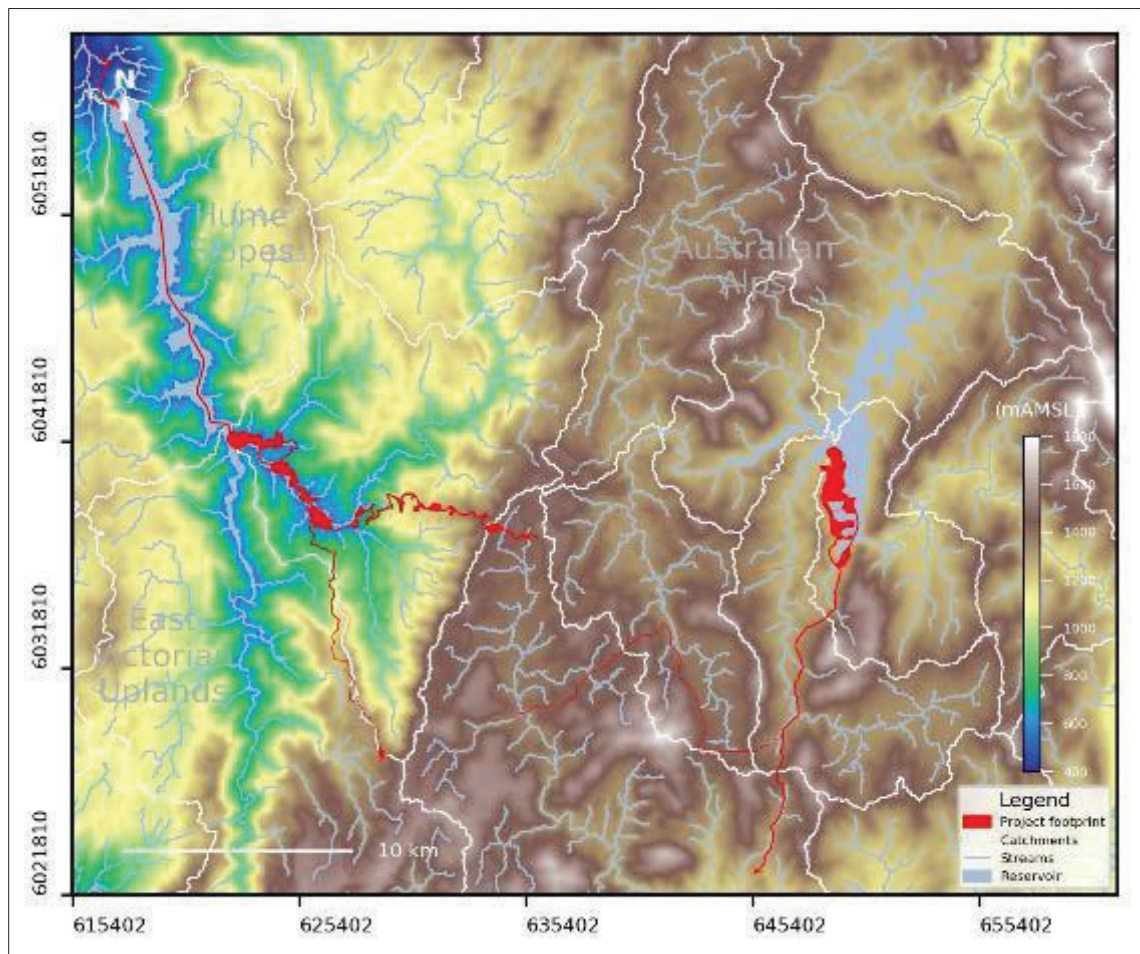


Figure 11 Physiographic regions named in the text with respect to elevations within the project area; hydrological catchment boundaries; and larger stream channels; constructed reservoir.

The terrain within the project area is generally steep at the peaks of elevations, but notably greatest in association with the valley forming part of the Hume Slopes. The distribution of gradients suggests that the valley has formed largely from channel incision after uplift of the Kosciuszko Massif, which has subsequently increased downslope flow energy.

Hydrology

Over the Australian Alps, hydrology is strongly controlled by the structural features of the Kosciuszko Massif, with straight, parallel valleys, being common in proximity to fault zones (Figure 11). The entirety of the Australian Alps within the project area drain to the east, and the East Victorian Uplands to the southwest. The Hume slopes drain to the northwest in a broad valley drained by the Tumut and Yarrangobilly Rivers. The headwaters of each originate in the south west and central north respectively; their courses broadly follow the escarpment of the Kosciuszko Massif until confluent at the Talbingo Reservoir. Because of the steepness of the adjacent

slopes, floodplains associated with the two rivers appear to be absent within the project area.

Precipitation within the project area is approximately 2,400 mm/yr (Barrows *et al.* 2001) and occurs predominantly in the form of snow within the alpine area. At the onset of the summer months, the snow melts and causes a substantial increase of fluvial discharge. The effect would have been greatly magnified as a consequence of the glacial advances of the LGM, which would have promoted substantially more snowfall. The increase of discharge during glacial advances would have increased the probability that sediments stored on the valley slopes would be mobilised and deposited on the floodplains of gentler downstream gradients.

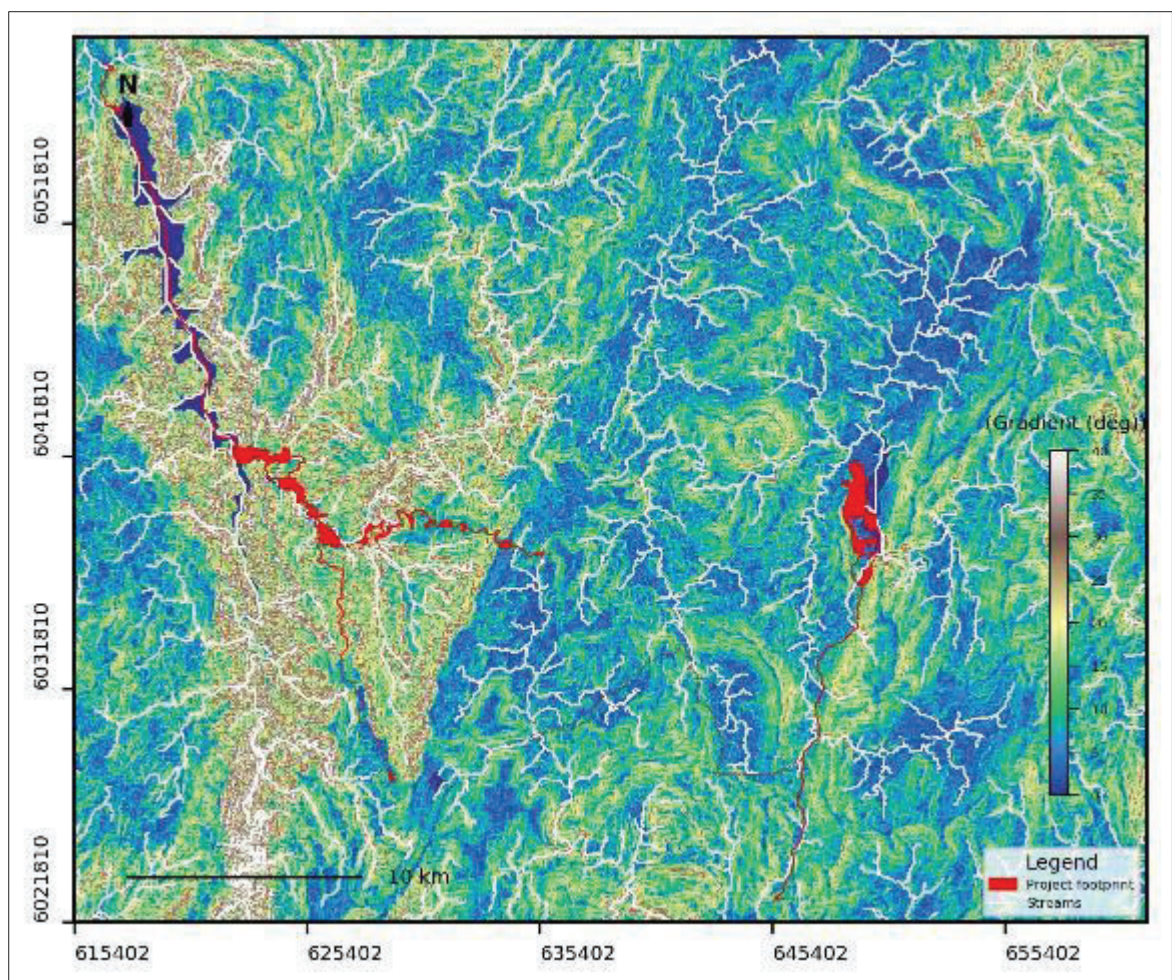


Figure 12 Slope gradients within the project area calculated from 30 m SRTM data (Jarvis *et al.* 2008) with respect to the project area and larger stream channels.

Regolith

Limited soil and landscape data are available for the project area at a reconnaissance catchment scale (1:100 000 & 1:250 000), limiting the quality of the available thematic maps (OEH 2017). Classes of the Australian Soil Classification (ASC)

(Figure 13) are available and show that the level-flat ground throughout the project area are dominated by Kurosols, which are acidic and strong texture-contrast soils (Isbell 1996). Many ridges, elevated depressions and lower slopes are composed of a combination of Rudosols and Tenosols. Rudosols tend to be young and have very little pedological development, hence commonly being located on young weathering products. Tenosols have very weak pedological development and may have a high organic content, associated with peat deposits overlying bare rock. Steep slopes associated with the western escarpment of the Australian Alps, and the slopes of the Victorian Uplands, are commonly composed of Dermosols, soils which do not have a strong texture contrast, potentially because of erosion of the surface units. In summary, the project area includes thin soils on elevated level-flats, pedologically developed soils on the weathering products of steep slopes, and poorly developed soils of variable depths on recently deposited colluvial sediments.

Table 5 Key to soil stability classes (Murphy *et al.* 1998).

Stability class	Description	Field Behaviour
R1	High coherence soils with low sediment delivery potential	Stable soils with no appreciable erosion. Generally well-drained permeable soils. Earth batters stable. No or little general evidence of coarse or fine sediment movement.
R2	Low coherence soil (when wet) with low sediment delivery potential	Sandy soils which, when exposed, commonly exhibit sheet wash and evidence of coarse sediment movement such as sediment fans at drain outlets and in gutters. Little sediment transport into drainage networks.
R3	High coherence soils with high sediment delivery potential	Clayey and silty soils which are liable to sheet erosion. Typically, slowly permeable and drainage generally impeded. Earth batters and exposed surfaces subject to minor to moderately extensive rilling and minor slumping. Minor gully erosion may develop in drainage lines and incision may occur along road drains. Localised films of fine sediment at drain outlets and in drainage lines.

Regolith stability in the region is largely affected by periglacial processes such as gelifluction (movement of waterlogged soil downslope during warmer months) and frost shattering of bedrock. However, these processes are most significant above approximately 2,000 m, which only occur at the higher peaks to the south of the project area (Barrows *et al.* 2001). Nevertheless, wherever steep terrain occurs the effect of colluvial processes (the downward movement of regolith) is substantially increased, particularly given the high precipitation rates and wet subsoil environments. Available mapping rarely indicates slope stability within the project area to be beyond minor (Figure 14; Table 5), most likely because of a stable vegetation cover protected as part of the Kosciuszko National Park. Higher rates of

erosion appear to correlate with particular geological units; a granite unit at the central southern edge of the project area is in fact adamellite and likely has a high sodium content, increasing slaking and dispersion and therefore susceptibility to erosion. Dacitic ignimbrite immediately north of the Tantangara Reservoir is also correlates strongly with higher erosion, although the reason is unclear.

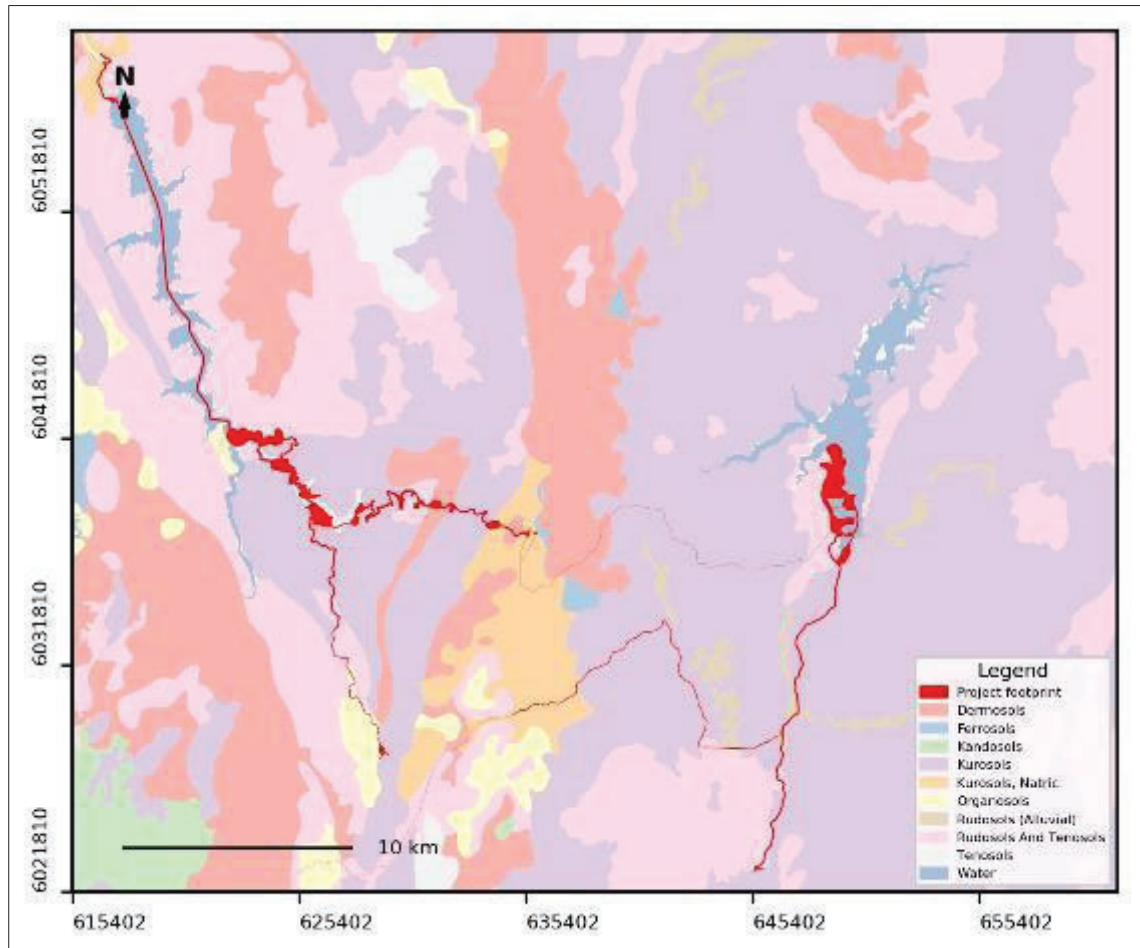


Figure 13 Australian Soil Classification (Isbell 1996).

The presence of stratified sediments is widespread on slopes, albeit colluvial and complex. There are no indications of alluvial deposits, even at the lower elevations within the project area in association with the Tumut and Yarrangobilly Rivers. Only where it debouches onto the Tumut Plains to the north of the project area does the plan view of the Tumut River adopt a meandering planform, indicating a stratified alluvial substrate.

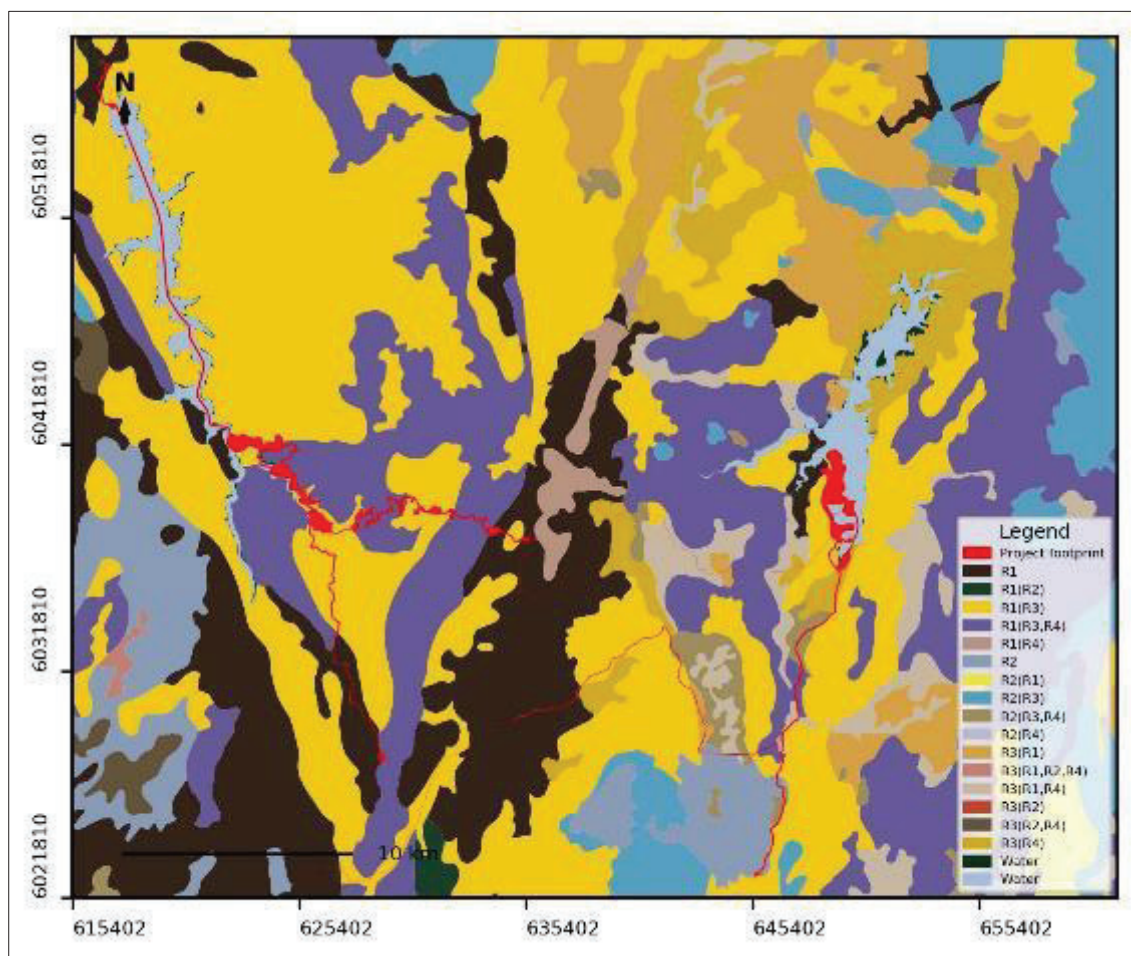


Figure 14 Soil stability (Murphy *et al.* 1998).

Vegetation

Vegetation communities in KNP are related to variation in altitude and rainfall. Four physiographic elements present include alpine, subalpine, montane and tableland communities:

- The Alpine areas are situated above 1,850 m. This area is dominated by tall alpine herbfield and heathland communities, and includes sod tussock grassland, short alpine herbfield, feldmark, bog and fen (NPWS 2000).
- Subalpine areas occur between c. 1,400 m and 1,850 m. This community is dominated by Snow Gum woodland. Frost hollows occur in valley bottoms and are treeless. These include sod tussock grasslands and fen and bog communities (NPWS 2000).
- Montane areas are situated between 1,100 m and 1,400 m. These are dominated by forests and woodlands (NPWS 2000).
- The tableland areas occur below 1,100 m. These contain savannah woodland communities (Plates 1, 2 and 3).



Plate 1 Lobs Hole and Yarrangobilly Gorge in background; taken from Lobs Hole Ravine Road; looking 40°.



Plate 2 The Yarrangobilly River at Lobs Hole; taken from near the Washington Hotel ruins, looking downstream.



Plate 3 The site of the Ravine township at Lobs Hole; taken from near the Washington Hotel ruin; looking 150° to the site of the Police Station (in copse of Elm on right).

Lobs Hole Ravine

Meteorological data from Talbingo is the most useful comparable material to describe the climate of Lobs Hole (Snowy Hydro Limited 2017c). At Talbingo, the mean monthly maximum temperature ranges from 12.5° in July to 30.3° in January. Mean monthly minimum temperature ranges from 3.0° in July to 15.3° in January. Given Lobs Hole is elevated at ~200 m higher, some minor variation to the Talbingo temperatures would prevail.

Lobs Hole is a locality in a valley of the Yarrangobilly River, on the western side of the Great Dividing Range. The valley is within a broader area of steep, mountainous terrain. Upstream of Lobs Hole, the Yarrangobilly River, Wallaces and Stable Creeks, become narrow, precipitous and gorge like. Lobs Hole is out-of-the-way, and being a valley of gentle topography and amenity, is a locally uncommon environment.

The valley is comprised of river flats, gentle gradient slopes and elevated crests. Situated at an elevation just below 600 m asl, the valley is likely to have provided respite throughout the year from the weather of the surrounding high country. It is difficult to recreate the pre-European environment of the valley with any great certainty. However, it is likely to have provided a relative abundance and diversity of flora and fauna, in addition to a reliable source of potable water and firewood. The Lobs Hole valley is likely to have been used regularly by Aboriginal people

throughout the annual cycle of movement through country. The material manifestation of that occupation is likely to be present as a relatively high density artefact distribution across the landscape.

Lobs Hole has been used since the early 1800s for the movement of stock, prospecting, grazing, settlement, refuge from the winters of Kiandra, gardening and agriculture, copper mining (from 1860s - ~1917) and recreation. Accordingly, the landscape has suffered relatively high levels of prior disturbance from discrete impacts such as building construction, mining and so on, but also more broadly from agriculture, grazing and erosion. The Lobs Hole Ravine Road is locally disturbed by direct impacts associated with road construction and electricity easement clearing.

During the construction of the Snowy Scheme, Lobs Hole was used during surveying work. A major surveying camp was set up by Major Clews at Lobs Hole (at the junction of the Yarrangobilly and Tumut rivers and now under water) and the Wallace Creek camp was apparently located near to the junction of Wallaces Creek and Yarrangobilly River (Rodwell 1999 - exact location unknown).

The 330kV transmission line from the Cabramurra switchyard traverses the Lobs Hole valley in a north/south alignment. During the construction of the Snowy Scheme, Lobs Hole was a recreational destination for workers. After the project was finished, these men met there for reunions when they enjoyed fishing, knife throwing competitions and the like.

The Plateau and Plains

Marica, Gooandra, Kiandra and Tantangara are sub-alpine environments at the northern end of Kosciuszko National Park. The landscape is comprised of a broad undulating plateau which gives way to the valleys of Tantangara Creek, Eucumbene River and Murrumbidgee River.

Frost, snow and cold weather conditions are typical of winter, but can be experienced at any time of the year. These harsh conditions create frost hollows in the valleys where cold air drains through the valley bottom. The cold air inhibits the growth of trees resulting in a reverse treeline effect, with snow grass and alpine heaths growing down in the valley, while Snowgums and Black Saltees are confined to the ridge tops (Cameron-Smith 1999).

The climatic conditions range from sub-zero temperatures with snow cover for at least one month of the year to recorded maxima of over 30 degrees in summer. Large daily temperature fluctuations are experienced resulting in regular freeze/thaw conditions during the colder half of the year.

Soils in the sub-alpine area have low nutrient availability due to high acidity and are highly permeable leaving them susceptible to severe erosion if the vegetation is disturbed (McKenzie *et al* 2004).

The Murrumbidgee River flows eastward and eventually south through the Tantangara valley where it is now dammed (Plate 4). The Eucumbene River flows southward through the undulating snow grass plains surrounding Kiandra (Plate 5).



Plate 4 The Murrumbidgee River immediately upstream of the Tantangara Dam wall showing a typical treeless plain. Photo taken during construction of the wall. Source: Steve Brayshaw.



Plate 5 The Eucumbene River flowing eastward through the Kiandra historic landscape.

5. HERITAGE PLACES

A series of heritage register searches have been undertaken for the area in and around the Snowy 2.0 project area. These searches have included statutory and non-statutory lists and databases at local, state and national levels. The details and results of each search are outlined below.

5.1 STATUTORY LISTINGS

5.1.1 Australian Heritage Database

The Australian Heritage Database is managed by the Australian Government Department of the Environment and Energy. This database includes places on the World Heritage List (WHL), National Heritage List (NHL), Commonwealth Heritage List (CHL), Register of the National Estate² (RNE) and places that are under consideration or have been under consideration for one or more of the above lists.

A search of the Australian Heritage Database was undertaken on Saturday 10th August 2019 for the following search area: Latitude 35°35'28"S to 35°58'34"S and Longitude 148°16'34"E to 148°46'37"E. The search was undertaken across all heritage lists within the database and included items wholly or partially within the search area that are located in NSW.

Twenty (20) places are listed within the search area on the Australian Heritage Database. Of these, two are Listed Places on a statutory register: *Australian Alps National Park and Reserves* and the *Snowy Mountains Scheme*, both of which are on the NHL. The *Kosciusko National Park* has been nominated for the NHL but is currently listed as ineligible for the "priority assessment list". Brandy Marys Bago State Forest Crown Leases also appears as a place nominated for the NHL that does not meet the National Heritage criteria. The remainder of places relate to RNE listings, of which one is an Indicative Place for which a decision on listing was not made prior to closing the RNE, and 15 are Registered Places on the RNE.

There are no places within the search area that are listed on the WHL or CHL.

The project area is within the *Australian Alps National Parks and Reserves* and the area designated as the *Snowy Mountains Scheme*.

² The Register of the National Estate was closed in 2007 and now operates as an archive of information about heritage places. All references to the RNE have been removed from the EPBC Act and the Australian Heritage Council Act 2003. Places on the RNE may still be protected under the EPBC Act if they are listed on another Commonwealth statutory heritage list or are owned or leased by the Commonwealth.

Table 6 Results of heritage register searches (*italic type denotes a statutory listing*).

Register	Item Name	Item Number	Status	Location
<i>NHL</i>	<i>Australian Alps National Parks and Reserves</i>	<i>105891</i>	<i>Listed Place</i>	<i>Snowy Mountains, Victorian Alps and Brindabella Range</i>
NHL	Brandy Marys Bago State Forest Crown Leases	105775	Place not included in NHL	East Bago Powerline Rd, Talbingo
NHL	Kosciuszko National Park	105848	Nomination now ineligible for PPAL"	Snowy Mountains
<i>NHL</i>	<i>Snowy Mountains Scheme</i>	<i>105919</i>	<i>Listed Place</i>	<i>Snowy Mountains</i>
RNE	Bimberi Wilderness	661	Indicative Place	30km northwest of Kiandra
RNE	Cooinbil Hut	103734	Registered	20km east-northeast of Talbingo
RNE	Coolamine Homestead and Associated Structures	1175	Registered	Blue Waterholes Trail, off Long Plain Road
RNE	Currango Homestead Group	19426	Registered	Tantangara Rd, Kiandra
RNE	Eucumbene Dam and Pondage	1057	Registered	Eucumbene
RNE	Four Mile Hut	103697	Registered	Kiandra Road, Cabramurra
RNE	Jounama Pine Arboretum	19492	Registered	Goobragandra Power Line Rd, Yarrangobilly
RNE	Kellys Providence Sawmill	103707	Registered	Snowy Mountains Hwy, Kiandra
RNE	Kiandra Courthouse/Chalet	103698	Registered	Snowy Mountains Hwy, Kiandra
RNE	Kiandra Mining Area	1056	Registered	Snowy Mountains Hwy, Kiandra
RNE	Kosciuszko Alpine Area	664	Registered	Jindabyne
RNE	Kosciuszko National Park (1981 boundary)	659	Registered	Snowy Mountains
RNE	Old Currango Homestead	103733	Registered	Port Phillip Trail, Yarrangobilly

Register	Item Name	Item Number	Status	Location
RNE	Snowy Mountains Scheme	1058	Registered	Snowy Mountains
RNE	Upper Murrumbidgee River	1050	Registered	Canberra to Tantangara Dam
RNE	Yarrangobilly Caves House Precinct	101585	Registered	Yarrangobilly
SHR	<i>Old Adaminaby and Lake Eucumbene, including relics and movable objects</i>	<i>01794</i>	<i>State</i>	<i>Eucumbene/Adaminaby</i>
SHR	<i>Currango Homestead</i>	<i>00983</i>	<i>State</i>	<i>Tantangara</i>
SHR	<i>Kiandra Courthouse/Chalet</i>	<i>00994</i>	<i>State</i>	<i>Snowy Mountains Hwy, Kiandra</i>
SHR	<i>Matthews Cottage</i>	<i>00998</i>	<i>State</i>	<i>Snowy Mountains Hwy, Kiandra</i>
LEP	<i>Fontenoy</i>	<i>27</i>	<i>Local</i>	<i>Yaouk</i>
LEP	<i>Homestead—Currango</i>	<i>I256</i>	<i>State</i>	<i>Tantangara</i>
LEP	<i>Kiandra courthouse/chalet</i>	<i>159</i>	<i>State</i>	<i>Kiandra</i>
LEP	<i>Lake Eucumbene</i>	<i>C2</i>	<i>State</i>	<i>Eucumbene</i>
LEP	<i>Matthews cottage</i>	<i>160</i>	<i>State</i>	<i>Kiandra</i>
LEP	<i>Milroy</i>	<i>28</i>	<i>Local</i>	<i>Yaouk</i>
LEP	<i>Yaouk Bridle Trail</i>	<i>I257</i>	<i>Local</i>	<i>Yaouk</i>
HHIMS	<i>Additional Accommodation Unit</i>	<i>5299</i>	<i>Section 170</i>	
HHIMS	<i>Alpine Sawmill</i>	<i>5408</i>	<i>Section 170</i>	
HHIMS	<i>Alpine Sawmill Hut</i>	<i>5410</i>	<i>Section 170</i>	
HHIMS	<i>Alpine Sawmill Water Race</i>	<i>5409</i>	<i>Section 170</i>	
HHIMS	<i>Alpine Sawmill Water Race No.2</i>	<i>5413</i>	<i>Section 170</i>	
HHIMS	<i>Bill Jones' Hut - Toilet; KNP Huts</i>	<i>5003</i>	<i>Section 170</i>	
HHIMS	<i>Bill Jones' Hut - Yards; KNP Huts</i>	<i>5004</i>	<i>Section 170</i>	
HHIMS	<i>Bill Jones' Hut; KNP Huts</i>	<i>5002</i>	<i>Section 170</i>	
HHIMS	<i>Bill Stanfield's Hut Site; Lodge precinct (L111)</i>	<i>4879</i>	<i>SHR Listed</i>	
HHIMS	<i>Black Jack's Hut - Fire Tower; KNP Huts</i>	<i>5125</i>	<i>Section 170</i>	
HHIMS	<i>Black Jack's Hut - Shed; KNP Huts</i>	<i>5124</i>	<i>Section 170</i>	
HHIMS	<i>Black Jack's Hut; KNP Huts</i>	<i>5123</i>	<i>Section 170</i>	

Register	Item Name	Item Number	Status	Location
HHIMS	Blacksmith's Shop And Salt Shed Ruin; Outbuildings precinct (O107)	4872	SHR Listed	
HHIMS	Blue Waterholes	8359	Section 170	
HHIMS	Brayshaw's Hut - Yards; KNP Huts	4995	Section 170	
HHIMS	Brayshaw's Hut; KNP Huts	4994	Section 170	
HHIMS	Building Remains	4847	Section 170	
HHIMS	Building Remains; Four Mile Hut	5014	Section 170	
HHIMS	Cabramurra Township	8338	Section 170	
HHIMS	Campbells Homestead/Hut	4744	Section 170	
HHIMS	Car Park	5306	Section 170	
HHIMS	Caretaker's Cottage	5288	Section 170	
HHIMS	Caretakers/Guides Cottage	5305	Section 170	
HHIMS	Cattleyards; Plains Precinct (s34)	4889	Section 170	
HHIMS	Cave Entrance Gates	5312	Section 170	
HHIMS	Caves Electrical System	5283	Section 170	
HHIMS	Caves House	5298	Section 170	
HHIMS	Cemetery	5327	Section 170	
HHIMS	Chicken Shed Site; Homestead precinct (H102)	4868	SHR Listed	
HHIMS	Circuit's Hut - Gulph's Pise Hut Site; KNP Huts	4979	Section 170	
HHIMS	Circuit's Hut Shed; KNP Huts	4980	Section 170	
HHIMS	Circuit's Hut Toilet; KNP Huts	4982	Section 170	
HHIMS	Circuit's Hut Yards; KNP Huts	4981	Section 170	
HHIMS	Circuit's Hut; KNP Huts	1804	Section 170	
HHIMS	Cologne Hutte	5345	Section 170	
HHIMS	Cooinbil Hut - Fencelines; KNP Huts	4976	Section 170	
HHIMS	Cooinbil Hut - Raceline; KNP Huts	4977	Section 170	
HHIMS	Cooinbil Hut - Slab Hut Site; KNP Huts	4973	Section 170	
HHIMS	Cooinbil Hut - Toilet; KNP Huts	4975	Section 170	
HHIMS	Cooinbil Hut - Well(s); KNP Huts	4978	Section 170	

Register	Item Name	Item Number	Status	Location
HHIMS	Cooinbil Hut; KNP Huts	4974	Section 170	
HHIMS	Coolamine Cheesehouse	4742	Section 170	
HHIMS	Coolamine Homestead	1719	Section 170	
HHIMS	Coolamine Mounds	4741	Section 170	
HHIMS	Coolamine Old Homestead / Southwells Homestead	4743	Section 170	
HHIMS	Coolamine Old Kitchen / Garage	4745	Section 170	
HHIMS	Coolamine Rubbish Heap	4740	Section 170	
HHIMS	Coolamine Site Of Barn / Hayshed	4747	Section 170	
HHIMS	Coolamine Site Of Hut	4738	Section 170	
HHIMS	Coolamine site of Stables / Blacksmiths	4746	Section 170	
HHIMS	Coolamine Stockyards	4749	Section 170	
HHIMS	Coolamine Toilets (2)	4748	Section 170	
HHIMS	Coolamine Water Race	4739	Section 170	
HHIMS	Cottage	5287	Section 170	
HHIMS	Cotterill's Cottage - Garage; KNP Huts	4971	Section 170	
HHIMS	Cotterill's Cottage - Toilet; KNP Huts	4972	Section 170	
HHIMS	Cotterill's Cottage; KNP Huts	4970	Section 170	
HHIMS	Currango Homestead	1771	SHR Listed	
HHIMS	Daffodil Cottage; Daffodil precinct (D18)	4880	SHR Listed	
HHIMS	Dairy Site; Homestead precinct (H101)	4874	SHR Listed	
HHIMS	Dam	5412	Section 170	
HHIMS	Delaney's Hut	1799	Section 170	
HHIMS	Drainage Fixtures	5284	Section 170	
HHIMS	Dry Dam Snow Course	9809	Section 170	
HHIMS	Duck Pond; Outbuildings precinct (S1)	4895	SHR Listed	
HHIMS	Earth Closet ruin; Daffodil precinct (D20)	4881	SHR Listed	
HHIMS	Earth Closet site; Homestead precinct (H103)	4865	SHR Listed	
HHIMS	Earth Closet Site; Homestead precinct (H103)	4866	SHR Listed	
HHIMS	Earth Closet; Daffodil precinct (D19)	4896	SHR Listed	

Register	Item Name	Item Number	Status	Location
HHIMS	Earth Closet; Homestead precinct (H3)	4908	SHR Listed	
HHIMS	Elaine Mine	4696	Section 170	
HHIMS	Elaine Mine Large Workshed/Blacksmiths Shop	4698	Section 170	
HHIMS	Elaine Mine Steam Engine	4699	Section 170	
HHIMS	Elaine Mine Water Races	4697	Section 170	
HHIMS	Elaine Mine Workers Cottage (1)	4700	Section 170	
HHIMS	Elaine Mine Workers Cottage (2)	4701	Section 170	
HHIMS	Elaine Mine Workers Cottage (3)	4702	Section 170	
HHIMS	Elaine Mining Complex	1698	Section 170	
HHIMS	Engine Shed; Plains precinct (P21)	4884	Section 170	
HHIMS	Eucumbene River Gauging Station at Kiandra	9807	Section 170	
HHIMS	Fence Line	5291	Section 170	
HHIMS	Fence Line	5314	Section 170	
HHIMS	Fenced Garden	5289	Section 170	
HHIMS	Fire Protection System	5281	Section 170	
HHIMS	Forge	5297	Section 170	
HHIMS	Four Mile Hut	5011	Section 170	
HHIMS	Four Mile Hut Group	1816	Section 170	
HHIMS	Four-mile Creek Gold Diggings	5013	Section 170	
HHIMS	Garage	5302	Section 170	
HHIMS	Glory Farm Dairy	5315	Section 170	
HHIMS	Glory Farm Family Cemetery	5330	Section 170	
HHIMS	Glory Farm Food House	5293	Section 170	
HHIMS	Glory Farm Hayshed	5326	Section 170	
HHIMS	Glory Farm House	5271	Section 170	
HHIMS	Glory Farm School	5282	Section 170	
HHIMS	Glory Farm Stable And Harness Shed	5304	Section 170	
HHIMS	Glory Farm Well	5328	Section 170	
HHIMS	Glory Farm Yards And Fences	5329	Section 170	
HHIMS	Gooandra Homestead	4945	Section 170	

Register	Item Name	Item Number	Status	Location
HHIMS	Gooandra Homestead	1790	Section 170	
HHIMS	Hayshed Site; Plains precinct (P113)	4886	Section 170	
HHIMS	Historic Rubbish Heap	5308	Section 170	
HHIMS	Homestead; Homestead precinct (H1A)	4906	SHR Listed	
HHIMS	Howard Florey Institute Store Shed Ruin; Outbuildings precinct (O108)	4882	SHR Listed	
HHIMS	Hydro System Dams	5278	Section 170	
HHIMS	Hydro System Plant	5277	Section 170	
HHIMS	Jersey Cottage	5290	Section 170	
HHIMS	Jounama Homestead	1922	Section 170	
HHIMS	Jounama Homestead Chicken Shed	5349	Section 170	
HHIMS	Jounama Homestead Circular Driveway	5357	Section 170	
HHIMS	Jounama Homestead Former Access Avenue	5352	Section 170	
HHIMS	Jounama Homestead Hut Ruin	5354	Section 170	
HHIMS	Jounama Homestead Ornamental Garden	5355	Section 170	
HHIMS	Jounama Homestead Shed	5360	Section 170	
HHIMS	Jounama Homestead Shed	5359	Section 170	
HHIMS	Jounama Homestead Sheds	5353	Section 170	
HHIMS	Jounama Homestead Stone Entrance Gate	5356	Section 170	
HHIMS	Jounama Homestead Well	5358	Section 170	
HHIMS	Jounama Homestead Wood Shed	5350	Section 170	
HHIMS	Jounama Homestead Yards And Fences	5351	Section 170	
HHIMS	Kiandra Chalet Camp	9799	Section 170	
HHIMS	Kiandra Court House/Chalet	5331	SHR Listed	
HHIMS	Kiandra Courthouse/Chalet Meteorological Station	5344	Section 170	
HHIMS	Kiandra Courthouse/Chalet Petrol Bowser	5342	Section 170	

Register	Item Name	Item Number	Status	Location
HHIMS	Kiandra Courthouse/Chalet Sheds	5341	Section 170	
HHIMS	Kiandra Courthouse/Chalet Tank	5340	Section 170	
HHIMS	Kiandra Courthouse/Chalet Toilets	5343	Section 170	
HHIMS	Kiandra Gold Diggings	5337	Section 170	
HHIMS	Kiandra Infrastructure Sites	5336	Section 170	
HHIMS	Kiandra Pioneer Cemetery	5338	Section 170	
HHIMS	Kiandra Settlement And Precinct	1921	Section 170	
HHIMS	Kiandra Three Mile Camp and Barracks	9800	Section 170	
HHIMS	Kiandra Township Sites	5339	Section 170	
HHIMS	Kings Cross Camp	9801	Section 170	
HHIMS	Kings Cross Quarry #1	10677	Section 170	
HHIMS	Kings Cross Quarry #2	10678	Section 170	
HHIMS	Kings Cross Quarry #3	10679	Section 170	
HHIMS	Kings Cross Quarry #4	10436	Section 170	
HHIMS	Kitchen	5295	Section 170	
HHIMS	Kitchen Wing; Homestead precinct (H1B)	4907	SHR Listed	
HHIMS	Link Road Quarry Site	10680	Section 170	
HHIMS	Lobbs Hole Cemetery	4850	Section 170	
HHIMS	Lobbs Hole Copper Mine	4844	Section 170	
HHIMS	Lobbs Hole Copper Mine	1762	Section 170	
HHIMS	Lobbs Hole Copper Mine Water Race	4845	Section 170	
HHIMS	Long Plain Hut No.1	1763	Section 170	
HHIMS	Long Plain No. 1	4851	Section 170	
HHIMS	Lorna Doon Mine	4720	Section 170	
HHIMS	Lorna Doon Mine	1709	Section 170	
HHIMS	Lorna Doon Mine Hut Site	4723	Section 170	
HHIMS	Lorna Doon Workshop Area	4722	Section 170	
HHIMS	Main Storage Shed/ Stables; Outbuilding precinct (O8)	4870	SHR Listed	
HHIMS	Manager's Office	5310	Section 170	
HHIMS	Matthew's Cottage	5347	SHR Listed	
HHIMS	Matthew's Cottage - Garden	5333	SHR Listed	

Register	Item Name	Item Number	Status	Location
HHIMS	Matthew's Cottage - Toilet	5332	SHR Listed	
HHIMS	Meat Shed; Homestead precinct (H4)	4909	SHR Listed	
HHIMS	Miller's Hut - Stock Yards; KNP Huts	5090	Section 170	
HHIMS	Miller's Hut; KNP Huts	5087	Section 170	
HHIMS	Mining Site	5411	Section 170	
HHIMS	Mountain Huts	8347	Section 170	
HHIMS	Northern yards; Plains Precinct (A/P121)	11572	Section 170	
HHIMS	Npws Arboretum	5318	Section 170	
HHIMS	NPWS Cottage; Yarrangobilly Caves	5319	Section 170	
HHIMS	Npws Footbridges	5322	Section 170	
HHIMS	Npws Hydro Building	5321	Section 170	
HHIMS	Npws Picnic Facilities	5323	Section 170	
HHIMS	Npws Pump And Fuel Storage Area	5320	Section 170	
HHIMS	NPWS Ranger's House; Yarrangobilly Caves	5317	Section 170	
HHIMS	Npws Stores	5324	Section 170	
HHIMS	NPWS Work Shed; Yarrangobilly Caves	5316	Section 170	
HHIMS	Office And Store; Homestead precinct (H5)	4864	SHR Listed	
HHIMS	Old Currango - Slab Hut Site; KNP Huts	5555	Section 170	
HHIMS	Old Currango Hut; KNP Huts	1991	Section 170	
HHIMS	Old Telephone Line Site; Homestead precinct (A/P119)	4903	SHR Listed	
HHIMS	Oldfield Hut No. 2	5081	Section 170	
HHIMS	Oldfield Hut No.2	1847	Section 170	
HHIMS	Oldfields Hut Ldfields Hut No.1	5177	Section 170	
HHIMS	Oldfields Hut Sites	1881	Section 170	
HHIMS	Original Homestead Site; Homestead precinct (H100)	4863	SHR Listed	
HHIMS	Original Shed; Homestead precinct (H6)	4905	SHR Listed	
HHIMS	Pattinson's Hut	5335	Section 170	
HHIMS	Peden's Hut; KNP Huts	5078	Section 170	

Register	Item Name	Item Number	Status	Location
HHIMS	Pine Lodge Chicken Shed Site; Lodge precinct (L109)	4885	SHR Listed	
HHIMS	Pine Lodge Earth Closet Ruin; Lodge precinct (L16)	4878	SHR Listed	
HHIMS	Pine Lodge; Lodge precinct (L12)	4873	SHR Listed	
HHIMS	Pocket's Hut Outhouse; KNP Huts	10687	Section 170	
HHIMS	Pocket's Hut; KNP Huts	5055	Section 170	
HHIMS	Poisons Store - Grain Store; Outbuildings precinct (O9)	4871	SHR Listed	
HHIMS	Post Office Operations Cottage	5273	Section 170	
HHIMS	Powerhouse Site	4846	Section 170	
HHIMS	Quarry	5272	Section 170	
HHIMS	Ravine - Lobbs Hole Village	4849	Section 170	
HHIMS	Ravine Hotel Ruin	5046	Section 170	
HHIMS	Relocated Jersey Cottage	5300	Section 170	
HHIMS	Reservoir Site; Plains precinct (S2)	4898	Section 170	
HHIMS	Ring Yards; Lodge precinct (L17)	4893	SHR Listed	
HHIMS	Road	5307	Section 170	
HHIMS	Sawyer's Hut	1834	Section 170	
HHIMS	Section Creek Construction Camp	9804	Section 170	
HHIMS	Sewerage Tanks And Lines	5280	Section 170	
HHIMS	Shearing Shed Complex Ruin; Plains precinct (P114)	4887	Section 170	
HHIMS	Sheds	5309	Section 170	
HHIMS	Sheep Yards And Sheep Dip Ruins; Shearing Shed; Plains precinct (P116)	4890	Section 170	
HHIMS	Shower Shed; Lodge (L14)	4876	SHR Listed	
HHIMS	Site Of Water Wheel	4848	Section 170	
HHIMS	Slaughter Shed Water Race; Outbuildings precinct (O11)	4892	SHR Listed	
HHIMS	Slaughter Shed; Outbuildings precinct (O10)	4883	SHR Listed	

Register	Item Name	Item Number	Status	Location
HHIMS	Slaughter Yard; Outbuildings precinct (O11)	4891	SHR Listed	
HHIMS	Snowgum Lodge; Lodge precinct (L13)	4875	SHR Listed	
HHIMS	Stable	5294	Section 170	
HHIMS	Stage And Harness Shed; Outbuildings precinct (O7)	4869	SHR Listed	
HHIMS	Stan Kelly's Providence Mill Alpine Sawmill Site	1958	Section 170	
HHIMS	Steam Engine And Boiler	4721	Section 170	
HHIMS	Sue City	5422	Section 170	
HHIMS	Sue City Quarry	9816	Section 170	
HHIMS	Sue City T2 Tailrace Quarry	11108	Section 170	
HHIMS	T2 Dog Leg Adit Spoil Dump	9819	Section 170	
HHIMS	T2 Tailrace Quarry	10682	Section 170	
HHIMS	Tantangara Spoil Dump (upper & lower)	10966	Section 170	
HHIMS	Telegraph And Telephone Lines	5276	Section 170	
HHIMS	Temporary Building/Tent Sites	5285	Section 170	
HHIMS	Tennis Court Site; Homestead precinct (H105)	4894	SHR Listed	
HHIMS	Tennis Courts No. 1 And No. 2	5303	Section 170	
HHIMS	The Hoad Entry Gates	5325	Section 170	
HHIMS	The Little Plain Buildings	5313	Section 170	
HHIMS	Thermal Pool	5274	Section 170	
HHIMS	Thermal Pool Dressing Sheds; Yarrangobilly Caves	5275	Section 170	
HHIMS	Three Mile Dam Battery Site	5378	Section 170	
HHIMS	Three Mile Dam Battery Site	1936	Section 170	
HHIMS	Three Mile Dam Hut Site	5380	Section 170	
HHIMS	Three Mile Dam Race	5379	Section 170	
HHIMS	Ticket Office; Yarrangobilly Caves	5311	Section 170	
HHIMS	Toilet Block; Homestead precinct (H2)	4867	SHR Listed	
HHIMS	Tooma-Tumut Access Adit Spoil Dump	9820	Section 170	

Register	Item Name	Item Number	Status	Location
HHIMS	Townsend Hut Complex	1820	Section 170	
HHIMS	Townsend Hut; KNP Huts	5018	Section 170	
HHIMS	Tumut Pond Construction Camp	9806	Section 170	
HHIMS	Tumut Ponds Reservoir Waste Dump	9818	Section 170	
HHIMS	Two Storey Accommodation Wing; Yarrangobilly Caves	5301	Section 170	Yarrangobilly
HHIMS	Vickery's Hut	5104	Section 170	
HHIMS	Vickery's Hut And Associated Sites	1858	Section 170	
HHIMS	Wash House	5296	Section 170	
HHIMS	Water Closet	5292	Section 170	
HHIMS	Water Race and Fencelines; Plains precinct (A/P120)	5552	Section 170	
HHIMS	Water Race; Four Mile Hut	5012	Section 170	
HHIMS	Water System Tanks And Lines	5279	Section 170	
HHIMS	Witses Hut	4605	Section 170	
HHIMS	Witses Hut	1657	Section 170	
HHIMS	Wolgal Club Lodge	5334	Section 170	Kiandra
HHIMS	Yarrangobilly Caves	1920	Section 170	Yarrangobilly
HHIMS	Yarrangobilly Caves Temporary Log Cabin Site	5286	Section 170	Yarrangobilly
HHIMS	Yarrangobilly Village	5371	Section 170	Yarrangobilly
HHIMS	Yarrangobilly Village Site	1929	Section 170	Yarrangobilly

5.1.2 NSW Heritage Register

A search was made of the State Heritage Register on Sunday 11th August 2019. The search was conducted within the area formerly known as the Cooma Monaro, Snowy River and Tumut Shires. The results of that search identified four State Heritage Register items listed by the Heritage Council of NSW, comprising two buildings at Kiandra, the old Adaminaby township at Lake Eucumbene and the Currango Homestead complex. The items listed on the State Heritage Register in or near the Project Area are listed in Table 6. The four items are outside the disturbance footprint of the project.

5.1.3 NSW OEH Historic Heritage Information Management System

The OEH Historic Heritage Information Management System (HHIMS) contains data and documents relating to heritage items on land managed by the NSW

National Parks and Wildlife Service. The HHIMS is the OEHS Section 170 Heritage and Conservation Register, which under Section 170 of the *NSW Heritage Act 1977* is the resource that OEHS uses for the protection and management of historic heritage within NSW National Parks.

A request for data relating to Kosciuszko National Park was submitted to the HHIMS Registrar on Friday 17th November 2017. Some 258 places are listed within the search area on HHIMS (Table 6). They include existing structures, ruins, mine workings and items of both local and state significance. Of the 258 items, nine are located within or very near the project area. However, none are expected to be impacted. Details of the items located within project survey areas are provided in Section 7. Their location is shown in mapping in Annexure 3.

5.1.4 NSW State Heritage Inventory

The NSW Heritage Inventory comprises three different types of statutory listed heritage items: declared Aboriginal Places that are listed under the *National Parks and Wildlife Act*, items listed by the Heritage Council of NSW under the *NSW Heritage Act* and items listed by Local Government and State Agencies.

A search was made of the State Heritage Inventory on Sunday 11th August 2019. The search was conducted within the area formerly known as the Cooma Monaro, Snowy River and Tumut Shires. The search was cross-checked with the relevant Heritage Schedules of the three Local Environmental Plans (LEP). Items that are situated within the project search area are listed in Table 6. They comprise the four SHR listed items and three items of local significance. None of these are within the project area.

5.2 NON-STATUTORY LISTINGS

5.2.1 Other OEHS KNP Heritage Listings.

In addition to the items listed within KNP on the HHIMS, there are various other sites and potential historical items that are listed on an informal NPWS database. A summary of the items located within or near the Project Area is provided in Section 7. The location of these sites is shown on mapping in Annexure 4.

5.2.2 National Trust Register

The National Trust of Australia (NSW) maintains a register of places, sites, buildings and landscapes that the National Trust deems to have cultural significance and be worthy of conservation. The National Trust Register is a non-statutory list. However, classification by the National Trust helps to provide recognition, and

promote public appreciation and concern for heritage places. It also means that the Trust may campaign and/or advocate for the protection of a place that is threatened.

A search enquiry was submitted to the National Trust of Australia (NSW) on Friday 17th November 2017.

There are 61 places within the search area listed on the National Trust Register. Of those, 34 are officially “classified” by the National Trust. None of the items on the National Trust Register are in the project area.

5.2.3 Kosciuszko Huts Association

The Kosciuszko Huts Association (KHA) formed in 1971 as a voluntary organisation to assist with conservation and management of huts and homesteads in KNP. The association has since expanded operations to include Namadgi National Park in the ACT. In addition to the conservation work undertaken on the huts, the KHA has conducted a major program of recording based on both field inspections and historical maps. This work provides what is probably the most comprehensive mapping currently available for items and places of heritage interest in KNP. Details of items present within or near each survey area are provided in Section 7. The KHA items are shown in mapping in Annexure 2.

There are over 1,200 historic routes that have been identified by the KHA in and around KNP. These include alignments of dray tracks and other access routes that date from the middle of the nineteenth century, bridle tracks, tracks established by the Snowy Mountains Authority in the middle of the twentieth century and late twentieth century four-wheel drive tracks. A number of identified routes intersect with the project area. The majority of these are un-named tracks and routes that have been mapped from various sources including parish maps, topographic maps and aerial photographs. There are 327 tracks and routes recorded within the project area. These items are listed below in Annexure 1. Tracks and routes that are within or traverse the project survey areas are listed in Section 7.

6 HISTORIC CONTEXT

The alpine region and high country has a rich historic context beginning with the early explorer-settlers in the 1820s, the establishment of pastoralism and summer grazing in the 1830s, the gold rush at Kiandra in 1859-60 and early scientific exploration. Throughout the twentieth century, the Snowy Hydro Scheme was built, scientific research developed further, and tourism and recreation promoted. Other lesser known activities include timber harvesting and milling, and Eucalyptus oil distilling.

For the purposes of this assessment, a summary overview of this history is presented to develop the relevant historical themes which will form a research context and contribute to formulation of a predictive model. While the focus is primarily on the Snowy Mountains, where relevant, this history is placed in the context of the broader region of the Monaro and Tumut areas and/or NSW and Australia as a whole.

6.1 EUROPEAN EXPLORATION AND EARLY SETTLEMENT

Clune (1964: 296) suggests that Joseph Wild, an ex-convict working for Charles Throsby, was the first non-Indigenous person to sight the Snowy Mountains. This occurred while Throsby, a farm owner at Bong Bong near Moss Vale, was overseeing the construction of the Goulburn Plains road. During the course of this work, Throsby was informed by Aborigines of the existence of a large lake to the south and, two days journey beyond this, a river which they called 'Mourumbidgee'. Responding to this, Wild led a short expedition and on 19 August 1820 located lake Wee-raa-waa, now known as Lake George. According to Clune (1964: 296), two days later, Wild climbed a hill near present day Bungendore and saw in the distance the Snowy Mountains. However, Neal (1976: 4) reasonably proposes that it is more likely that Wild observed the snow-capped peaks of the Canberra area.

Much of the impetus for early exploration in NSW was driven by the need for new land for grazing (Andrews 1998). In 1823, a group of experienced explorers gathered at the Throsby property at Bong Bong to prepare for their next expedition. The men in question were Charles Throsby, Captain Mark Currie, Major John Ovens, Joseph Wild and an Aboriginal guide. They set out to explore the land south of Lake George. The party attempted to follow the Murrumbidgee south but upon encountering rugged terrain they elected to travel a few kilometres to the east through a chain of clear downs that is believed to have been the Michelago, Colinton and Bredbo valleys. It was during this part of the journey that they came across an Aboriginal tribe near Billilingra. After overcoming some apparent initial fear of the newcomers the Aboriginal people engaged in conversation with the assistance of the guide accompanying Throsby's party, and amongst other things, they informed the explorers that the area of the rolling downs was the 'Monaroo'. The group continued

on and crossed a river they presumed to be the Murrumbidgee, but is more likely to have been the Numeralla, and made it to an area in the vicinity of present-day Bunyan before having to turn back on account of their limited supplies. They named the treeless plains 'Brisbane Downs' after the governor of the time, however the Aboriginal name proved the more popular name in time (Neal 1976: 5-6; Plowman 2007: 6, 8-9).

At this time in the early history of Australia, while exploration was reasonably extensive, there were attempts by the government to contain settlement to the area around Sydney. Governor Darling established the "limits of location" in 1826, an arbitrary line around the Sydney region, bounded by the Manning River in the north, the Lachlan River in the west and the Moruya River in the south, that designated the area within which European settlers could officially be granted land. In 1829 the limits of location were extended to include an area known as the Nineteen Counties, which included County Murray (bounded by the Murrumbidgee River) on the Limestone Plains (Poiner & Jack 2007; Campbell 1968). While the official limits of location were a bureaucratic attempt to contain settlement and maintain order in the colonies, the reality was that the more intrepid and entrepreneurial settlers were exploring lands outside the limits of location and squatting on land that suited their purposes (Campbell 1968).

European settlement of the Monaro began in the late 1820s. The Limits of Location at that time ended at Michelago, so all settlement to the south was technically illegal. Census records from 1828 indicate that there were already 20 new settlers on the Monaro, although there is some confusion regarding this number since the people listed were all servants living on the Limestone Plains. Nevertheless, Richard Brooks is known to have had stock and men at *Gegedzerick* near Berridale in 1827. In 1832, William Glanville came to the area to work for Joseph Ward at *Wambrook*. He reported that at that time there was a hut at Cooma (Kuma) belonging to Cooper and Levy and that *Coolringdon*, *Gegedzerick* and *Wambrook* were the only stations to the west of this. Two years later, John Lhotsky relayed information from Mr Bath, the manager of Kuma Station, that R. Campbell had been established at Waterholes, near Michelago for seven years, Richard Brooks had been at *Jijedery* (Gegedzerick) for six years, Cooper and Levy had been at Cooma for five years and Dr Reid had been at Bunyan for a similar period of time. Similarly, the White family had been at *Tom Grogin* near Nimmitabel for around four years and other families were established at *Yinibrothers*, *Billilingra*, *Bulungewaing* and various other stations around the Snowy and MacLaughlin Rivers (Neal 1976; Plowman 2007: 10).

When John Lhotsky travelled through the region in 1834, he considered himself 'surrounded by absolute anarchy and lawlessness' (cited in Andrews 1998). At that time, the majority of men living on the Monaro were assigned servants either serving

their sentence, ticket of leave, or freed and in employment (Andrews 1998). The theft and resale of livestock was common practice.

6.2 PASTORALISM AND SUMMER GRAZING IN THE HIGH COUNTRY

Soon after its first sighting, graziers began progressively occupying land in the Monaro. By 1826, Robert Campbell of Duntroon on the Limestone Plains established a grazing run on the lower Snowy River near Delegate. In 1827, Richard Brooks pioneered grazing in the Berridale area with his Gegedzerick run which extended to the Crackenback River, the present-day boundary of Kosciuszko National Park (Andrews 1998: 94-98, HO&DUAP 1996). There are also claims that the first residents of the alpine area were the Prendergast family who arrived in the early 1820s (Good 1992: 136-140, Gregors 1979: 3).

George Palmer, who lived at *Jerrabomara* on the Limestone Plains, first considered the locality of Kiandra as an outstation in 1833. He established a camp on a treeless plain, not far from where the Coolamine homestead was later built, and an outstation at *Ucumbene*, just below Kiandra on the Snowy River. At the same time, Dr Andrew Gibson, who held land near Goulburn, also established an outstation in the area. Gibson's Plain, near Kiandra is named after Dr Gibson, who reportedly built stockyards at this location in 1839. However, by time the stock yards were complete winter had set in and his cattle died (Moye 1959: 7).

The Faithful family, related by marriage to the Gibsons, also settled on the Eucumbene in 1833 with four hundred head of cattle. They ran their stock into the mountains and shared pastures with Palmer and Gibson. However, the area was to prove much too inhospitable for the permanent grazing of cattle and all had left the region by the 1840s (Gregors 1979:3-5, Moye 1959:3).

Settlement in the Tumut Valley began following the 1824 discovery of the Tumut River by Hume and Hovell. Eighty settlers are recorded as early as the late 1820s at Tumut Plains (French 1965). At this time, Tumut was reached via Yass from the settled areas to the north. John Bowman came to the Monaro as early as 1834 and ran cattle, more or less illegally, from Talbingo to Kiandra. While shepherding cattle in the Yarrangobilly ravine he sought shelter from a thunderstorm and discovered the Yarrangobilly Caves (Bridle 1979:9, Moye 1959:2).

By the end of the 1830s all the principal pastoral runs of the area were established and settled by squatters (HO&DUAP 1996). With the introduction of the Squatters Act in the 1840s some 172 pastoral runs were gazetted across the Monaro. It was also around this time that the Monaro was officially recognised within the counties of New south Wales. The Monaro was divided into three counties in 1848. The counties of Beresford, Wallace and Wellesley essentially corresponded to distinct topographic zones in what became the Snowy Monaro shire. County Wallace

encompassed the alpine and subalpine mountain ranges bounded by the Murrumbidgee River in the north and the Snowy River in the south, what is effectively the modern Snowy Mountains Alps. Country Beresford encompassed the north-eastern tableland areas between 1,000 m and 1,600 m elevation, what is effectively the Cooma-Monaro tablelands, and County Wellesley encompassed the lower elevation tablelands in the southeast, in what was effectively the Bombala shire (HO&DUAP 1996: 118).

During the 1830s and 1840s, the Snowy Mountains came to be used for summer grazing during drought and as a thoroughfare for the movement of stock between properties or to different markets. Terrence Murray (*Murray of Yarralumla*) is possibly the first white person to cross the Snowy Mountains from the east (Wilson 1968: 70). Wilson (1968) suggests two reasons for him to be in the area in about 1834. As magistrate of the southern districts (appointed in 1833), he may have travelled the area in a campaign against bushrangers. Also, as a trustee of Captain Bunn's estate, he is likely to have travelled to the Bunn sheep stations on the Monaro via Cooma and Adaminaby. Later, in January 1839 during drought when he owned the *Yarralumla* run (from 1837), he went across the Brindabella Range into the Coolamine Plain in a search for alpine pasture. Previously, his friend Dr Andrew Gibson, had told him about *Cooleman*, *Gurrangorambla* (Currango) and *Nungar* (Wilson 1968:105).

After reaching Coolamine, Murray pressed on, aiming to reach Tumbarumba and Mannus (usually reached at that time via Yass and Gundagai) where acquaintances owned an outstation (Murray may also have owned his Mannus station by then). The expedition went via Long Plain, Rules Point, Fiery Range above Yarrangobilly, Mount Talbingo and the Tumut River. The journey had been exceedingly arduous, and when they reached the river, Murray determined that they couldn't go on and turned around to return to Coolamine via the same route. Apparently, upon their return to Coolamine, they released their horses, never to be seen again (Wilson 1968: 109). As soon as they reached Yarralumla, preparations were made to return to Coolamine with stock where Murray established a station and outstations. Murray was to make another journey into the mountains in April of the same year, at which time he explored the Yarrangobilly area to search for a way to take bullocks drays to the Tumut River to get provisions to Mannus and Jingellic.

In 1841, Murray was required to go to Melbourne for business. Rather than travel to Sydney to join a ship, he rode overland (Wilson 1968: 123). The journey was undertaken by three men, all of whom were mounted, with a packhorse carrying their luggage and provisions. The riders made the ranges east of Coolamine by nightfall of the first day. The second night was spent beside the Tumut River near Lobs Hole. This is possibly the first reference to the locality Lobs Hole in the historical literature, and Murray is certainly one of the first settlers to have visited

there. Murray returned to Yarralumla within 18 days of having departed. Murray passed through Lobs Hole again in 1841 on this way home after inspecting his Mannus and Jingellic properties. Thereafter, Murray apparently frequently sent bullock drays to Mannus and Jingellic via Yarrangobilly and Lobs Hole (this is believed to have been via Toll Bar Ridge).

Crawford (2016) also drove cattle through Lobs Hole in 1841, and later in 1847, 100 head of horses. Crawford described the descent into Lobs Hole as follows:

We found it very difficult to drive the horses down into Lobs Hole. The walls are very steep. And although the horses would go up or along the siding, they objected to going down. On one place, after we had gone a full mile in a descending circle, we could still speak with those above us, who were at the place from which we started – and that without great effort.

In response to the drought of 1837-1844, like Murray of Yarralumla, many pastoralists in south-eastern Australia began to move their stock to the high country during summer where food and water were abundant. According to King (1959, 129), the highlands of Tasmanian and south-eastern New South Wales were the only places in Australia that played a role in relief grazing (see also Merritt 2003). The summer grazing led to the establishment of well-defined stock routes and stock mustering points such as the town of Jindabyne (King 1959, 131).

Lobs Hole came to be located on the Port Phillip route between the Monaro and Victoria. The squatter William Brodribb is known as the second person to overland cattle from the Monaro to Port Phillip in 1858. Having purchased about 2,000 head of cattle from *Coolringdon*, near Cooma, Brodribb drove the first draft of the herd to Victoria via Lobs Hole and described the journey ‘... on the whole ... as ... a very arduous one...’, vowing never to do it again.

The use of the snow belt became particularly important following the introduction of the Robertson Land Acts in the 1860s. The new land legislation enabled smaller selectors to take up land grants and the result was the creation of an intricate mosaic of smaller parcels within many of the larger squatting runs. The consequence was that the smaller farms were more susceptible to drought, and so the practice of summer grazing in the higher alpine areas became critical to their success. These areas had not been extensively grazed prior to the 1860s. Some initial grazing attempts in the 1830s had met with stock losses due to snow (e.g. Dr Gibson’s cattle that died at Gibsons Plain near Kiandra in 1839), and despite observations of the good summer grazing opportunities available, it wasn’t until the drought of 1865 that one of the larger stations at Cooma led the way in summer grazing becoming commonplace. The practice continued for another 100 years and saw substantial increases in the carrying capacity of farms on the Monaro.

In 1889, the New South Wales Government introduced the Snow Lease system in an attempt to prevent the alienation of land and to maintain the area for the use of all graziers during drought periods. This system was never effectively implemented and a 'collective monopoly' by pastoral companies and local individuals arose. Summer grazing was eventually halted through complete prohibition in 1969.

Part of the physical legacy of summer grazing are the various slab, weatherboard and corrugated iron stockmen's huts that were built throughout the snowy mountains (HO&DUAP 1996: 119-120). While the snow huts are perhaps the most evocative and iconic material expression of pastoralism and summer grazing in the high country, remnant stock yards and fences are the most ubiquitous. When the First Fleet arrived in 1788 it carried with it less than ten sheep. Along with cattle, these were precious animals imported with a view to establishing a source of food for the new colony. However, by 1870, through breeding and further importation, sheep numbers had soared to over thirty-six million and the export wool clip was over sixty-three million kilograms (Pickard 2008).

The main perils to farming sheep were theft by Aborigines, attack by dingoes, and sheep simply becoming separated from the flock and ending up lost. To combat this the traditional British practice of shepherding was perpetuated. Sheep were tended by a shepherd or shepherds during the day and at night they were yarded into folds. Accordingly, shepherds were an important aspect of running sheep in early colonial Australia. They proved to be both efficient and effective in sheep management, not least because their wages were relatively cheap, especially initially when convict service was low-priced and abundant (Pickard 2008).

Commonly sheep were formed into flocks of three to four hundred, with each flock being overseen by a shepherd. Most often one or two shepherds were based at an outstation, located at some distance from a property's farmstead. The shepherd would usher his flock from the outstation before dawn to graze and return them to the fold at dusk where they spent the night. An established outstation often consisted of a pole-frame hut, maybe eleven by twelve to fifteen feet in size, covered with bark or shingles and with an earthen floor. Up until the mid-1800s such a structure was the wide-ranging style of dwelling that crossed all classes, be they squatters, convicts, free labourers, selectors or homesteaders (Pickard 2008).

Associated with the outstation was a set of yards for each shepherd, made of moveable hurdles. The hurdles were essentially short sections of fence which were portable, and which interlocked to form a holding pen. A hut-keeper or watchman was often employed with duties that entailed cooking, moving hurdles every few days, and watching the yarded flocks at night. A sizable fire was often maintained overnight in order to frighten native dogs away from the fold. The watchman

commonly had his own dog and slept in a small portable weatherproof watchbox (Pickard 2008).

Sheep numbers in the country continued to grow and by the 1830s there were not enough convicts to carry out all the shepherding so that emancipists and ticket-of-leave men were required to be employed. Thereafter, during the gold rushes of the 1850s, it is commonly thought that shepherds absconded to the goldfields in scores, forcing pastoralists to pay significantly higher wages to employ their workers while at the same time vastly increasing the sizes of their flock so as to combat costs. However, Pickard (2008) contends that this was not the case, but rather that with the end of convict transportation squatters were forced to employ free labour.

While the typical image of a colonial shepherd is one of a single white adult male, there was frequently more diversity in the workforce. This was especially so during phases of labour shortages and escalating wages. Married couples with children were employed, with the wife cooking and all the family expected to play their roles in tending the sheep. Indeed, it was not unknown for wives and children to take over the entire shepherding duties when some husbands tried their hand on the goldfields. Germans, Chinese, and when relations became more peaceful – Aborigines, were all employed in various districts to tend sheep (Pickard 2008).

In 1847, on the Monaro, Benjamin Boyd even employed Melanesians (kanakas), briefly. Boyd was notorious for being a harsh task master. At a time when other shepherds were being paid around £25 per year, Boyd signed up 65 Melanesians to work for five years at a pay rate of twenty-six shillings per year. Landing them at Boydtown, he transferred this crew to the harsh windswept open plains of the Monaro to tend his large flocks on his vast station, expecting them to camp in the open. It was not long before many of the disgruntled men fled, walking some four hundred kilometres north to Sydney (Pickard 2008).

Prior to squatters being granted some security of land tenure, they were reluctant to invest in properties from which they could be summarily evicted without receiving compensation for improvements they had made. Because of this, up until the mid-1840s, fenced enclosures were a rare feature in the rural landscape. If any fencing was constructed it was generally for one large paddock around some 100 acres, built to contain bullocks or horses. Thirty or even fifty kilometres could be travelled along country roads and tracks without a fence being sighted, and when a post-and-rail fence came into view you knew you had arrived at the house (Peterson 1988).

In 1844 some security of tenure was granted to squatters during a lease which offered compensation for improvements such as dams and fences. Soon after, in 1847, an Order-in-Council further offered long leases and pre-emptive rights of purchase to squatters (Peterson 1988). Thereafter, gradually over time, the significant

changeover was made from managing sheep with shepherds, to allowing sheep to wander and graze freely within fenced paddocks.

Pickard (2007) proposes, however, that in order for this innovation to have taken hold a number of compatible changes needed to occur. First and foremost was for it to be recognised that open camping sheep was more beneficial for the flock than night-yarding. This was understood early by some and by the mid-1800s a number of graziers had observed that open-camped sheep grew fatter, their wool clip volume improved, and wool quality was also better (Pickard 2007). Being able to continuously graze was no doubt a large contributing reason for these benefits. Another over-riding factor was the change in land tenure, as discussed above. Once pastoralists had more certitude of ownership, they were more inclined to invest in improvements such as fencing (Pickard 2007).

Without attendant shepherds, sheep would be vulnerable to theft by Aborigines and attack by dingoes. However, Aborigines became less of a risk to livestock as pastoralism intensified and expanded, displacing their inhabitants. Concurrently, from the mid-1840s, strychnine began to be used to remove dingoes in many areas (Pickard 2007).

A basic impediment to constructing fences was the cost. While rudimentary brush and log fences were relatively cheap to build, the more complex fences such as post and rail were laborious to construct, costly, and required significant amounts of timber. However, when shepherds became scarce and their wages correspondingly increased, constructing fences became increasingly viable. Economic gains could be made because open-camping produced a higher wool cut per head, increased carrying capacity per acre, larger sheep, higher lambing rates and less disease in flocks (Pickard 2007). A final compelling reason for fencing was to demarcate boundaries as freehold land increased, and in so doing facilitate improved management of the sheep, and to protect them from neighbours and disease (Pickard 2007).

As the building of fences became more common it was primarily a range of wooden fence styles that continued to be erected because they were cheaper and in many instances' expedient. However, starting slowly in the 1860s, pastoralists increasingly employed the new technology of wire. At that time in Britain wire fences were combined with iron posts, but Australian pastoralists rejected this more costly option and instead combined the wire with cheaper wood posts cut from the property. Combined with this was the significant cost saving innovation of increasing the spacing between posts. The strongest method of construction was to sink wooden posts into the ground at 30-foot intervals, string wire between them, and then support them with four or five non-load-bearing posts between. As this style of fencing became more commonplace the cost of wire fell, and because of the serviceability of wire fences they became endemic. The subsequent innovation that

was quickly broadly adopted was barbed wire, which was introduced in Australia in the 1880s. Most commonly the barbed wire formed one or some of the strands of wire that were strained along the fence line (Pickard 2007; 2010).

The project area traverses land previously occupied by numerous historic pastoral runs. These are discussed further below with reference made to any documented related structures, some of which may still exist.

The Gooandra Run - It is likely that at least part of the area that would become known as the Gooandra Run was subject to intermittent cattle grazing by the early 1830s. As noted previously, some form of summer grazing was almost certainly being practised by pastoralists and squatters of the Monaro and Snowy River districts directly following Thomas Pendergast's settlement in the region in 1821 (Gregors 1979: 3). According to correspondence reported in the Sydney press, two herds of cattle belonging to Andrew Gibson and Thomas Palmer were caught in a heavy snow storm at 'Guyandra' (Kiandra) in the winter of 1834, resulting in the loss of three hundred cattle and one of Gibson's stockmen (*The Australian* 22 August 1834; *The Sydney Monitor* 17 September 1834).

A third group of four hundred head of cattle depastured in the area at the time survived the storm due to their removal to lower ground the day before. The individual responsible for relocating the herd related that he had moved them "from a station, near to Dr. Gibson's and Mr. Palmers", on the "highest part" of the Australian Alps (*The Sydney Herald* 23 October 1834). This information is suggestive of the presence of a number of at least rudimentary stations in and around Gooandra at quite an early stage. A large, old stockyard had certainly been reported at Gibsons Plains by Stewart Ryrrie in early 1840 (Andrews 1998: 152) and an account by John Gale (1875 in Otto Cserhalmi & Partners 2007: 46) tells of a similar construct on southern Cooleman Plain known to have been created by George Palmer in the mid to late 1830s. Given the geographical positioning of Gooandra roughly between these locations, it is reasonable to assume the possibility of some degree of early phase pastoral expansion into the naturally grassy sections of the local landscape.

Formal pastoral use of the setting is said to have occurred by 1851 when Oltman Lampe had acquired a lease for 16,000 acres at Cooleman Plain and 'a substantial holding at Gooandra' (Otto Cserhalmi & Partners 2007: 41) although no prescribed evidence for the latter acquisition is given. Higgins and Scott (1991) suggest a timeframe of the 1860s when the area most likely fell within the leasehold boundaries of the 32,000 acre Long Plain Run acquired by George Peppin in 1864. Government records of holdings and transfers of runs after this time show the Long Plain lease to have been subsequently held by Mary Russell and then John Cochrane in 1866 (*New South Wales Government Gazette* 8 February 1866 (37): 407). Cochrane held the lease for some years before transferring to James Forsyth in 1875 (*New*

South Wales Government Gazette 1 November 1870 (267): 2419; 1 Nov 1875 (293): 3497), a tenure that was succeeded the following year by J. Mc Graw, J. Cochran (sic), J.M. and H.N. Loughnan, J. Wilson and S. Brush (*New South Wales Government Gazette* 25 April 1876 (130): 1631). By 1881, the run was held by Albert Austin and Thomas Milliar (*New South Wales Government Gazette* 2 December 1881 (497): 6233).

In 1885 Gooandra was part of the allotment known in government records as Long Plain Pastoral Holding No. 95 (comprising the Long Plain Run) which was included that year in a division of pastoral holdings into Crown and Resumed Lands (*New South Wales Government Gazette* 11 July 1885 (278): 4298). By this stage the local high country was being stocked primarily with sheep, essentially during the summer months as profitable year-round occupation was found to be prohibitive due to the harsh winters. An additional emerging adverse factor in the lease area was foot rot which led to the partial abandonment of the local country during the 1890s (Higgins and Scott 1991). Cattle, though comparatively reduced in numbers, appear to have still been run: 'a stud draft of heifers' from 'Goandra' was reported in 1872 (*The Riverine Herald* Wed 9 October 1872: 2) and '220 fat cattle (Hardie and Millar's) from Goandra' were sent to Sydney in 1880 (*Wagga Wagga Advertiser* Sat 28 Feb 1880: 3). Also illustrated here is the recognition of Gooandra ('Goandra') as a named or known succinct component of country within the Long Plain Run, although the character of its demarcation and association with the toponym is not apparent.

The practice of moving stock into the well-watered high country around Kiandra during harsh summers is believed to have become a regular pastoral procedure by the mid-1850s; however it was not until 1893 that resultant governmental response to the system came about with the establishment of Snow Leases in the 'snow lands' on the main range in the vicinity of Cooma, Kiandra, Tumbarumba and Tumut (O'Connor 2004: 15). An 1890 plan of the snow leases falling within the parishes of Gooandra, Kiandra, Nungar and Tantangara provides an indication of the rough extent of the 'Gooandra Run' within the context of the newly conceived lease blocks – Snow Leases 15, 18, 19, 20 and 21 (SL21 encompassing the homestead block for the Long Plain Run) (Figure 15). At this time an old miners' hut believed to possibly date to the 1860s and forming the locus for the future Gooandra Homestead complex near the headwaters of Gooandra Creek was incorporated into Snow Lease 20, a block most commonly associated with the run (Higgins and Scott 1991). Adjacent snow leases, principally SL19, part 15 and most likely 18 also fell within the sphere of influence and management emanating from the homestead, particularly when the declaration of local Scrub Leases came into effect in following years. It is of interest to note the statement of improvements for Snow Leases 18 to 20 on the 1890 plan, namely a considerable amount of brush and six wire fencing (Figure 16). This information runs contrary to the assertion that the Gooandra run was devoid of fencing prior to H.F. Lampe's acquisition of the property in 1903 and that all

improvements up that point had most likely been restricted solely to land clearance (cf. Higgins and Scott 1991).

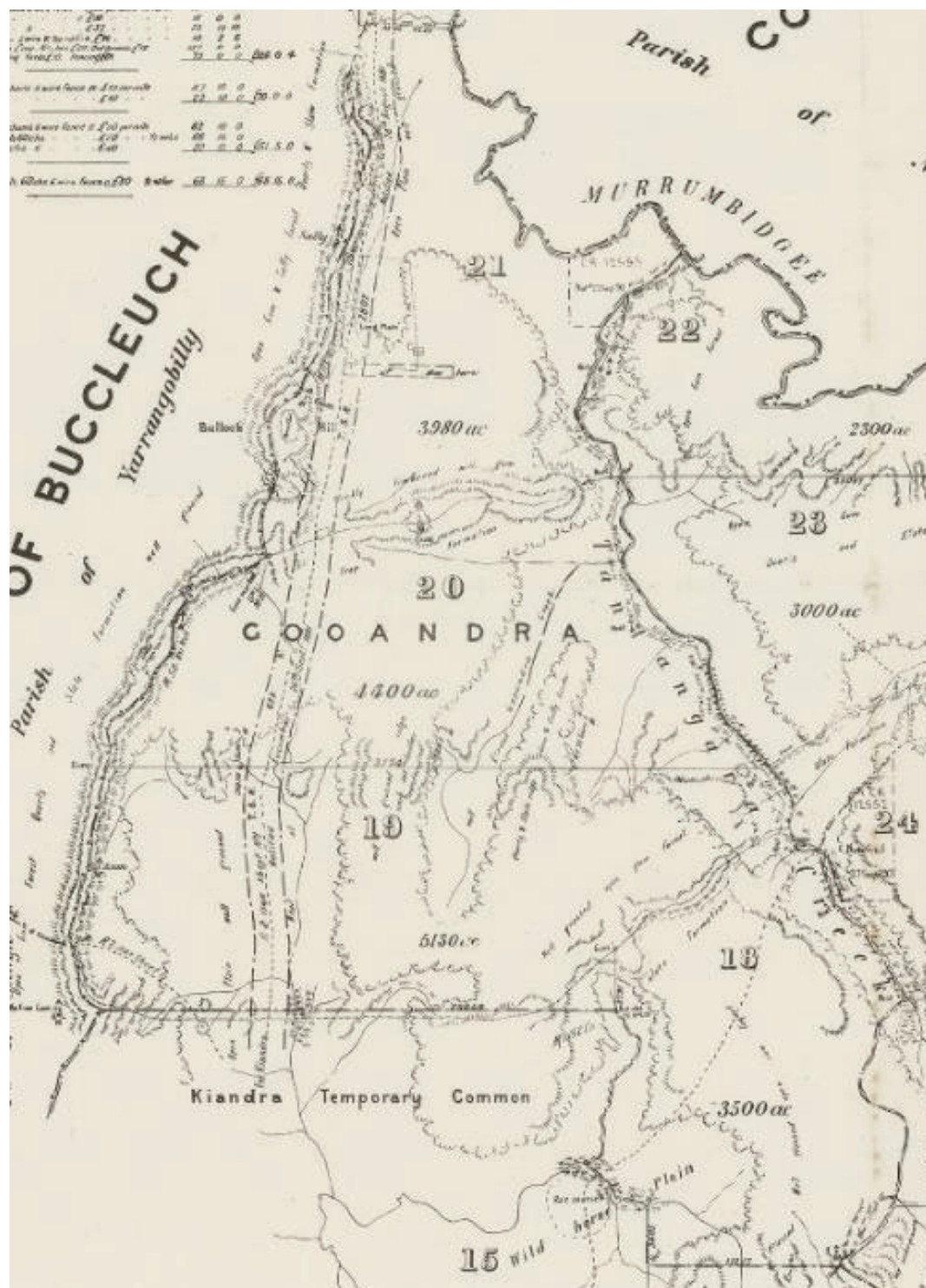


Figure 15 Excerpt from the Plan of snow leases lots numbered 11 to 31 inclusive, parishes of Gooandra, Kiandra, Hunger & Tantangara, County of Wallace, and district of Cooma' 1890 (from the collection of the State Library of New South Wales).

Improvements

<u>On S^NL 18 30 Chains Brush Fence c £10 per mile 1/2 value</u>				5	12	6	
30	6 wire	c £35		6	11	3	
40		c £40		10	0	0	£22.3.0
<hr/>							
<u>On S^NL 19 50 Chains Brush Fence c £10 per mile</u>				6	5	0	
30			1/2 value	5	12	6	
30	6 wire	c £35		6	11	3	
60		c £40		15	0	0	£33.8.9
<hr/>							
<u>On S^NL 20 2 miles Brush Fence c £10 per mile</u>				20	0	0	
2 miles 60chs	do	c £8	1/2 value	11	0	0	
2	50	6 wire	c £35	45	18	9	£76.18.9
<hr/>							
<u>On S^NL 21 2 miles 60 chains Brush fence c £8 per mile 1/2 value</u>				11	0	0	
4	20		1/2	42	10	0	
42 chains	6 wire Fence	c £35		18	7	6	
2 miles		c £40	1/2 value	40	0	0	
House	£100	Kitchen	£15	126	10	0	
Drafting Yards	£10	6 wire Fence	£35	70	0	0	£308.7.6
		Log fence	£25				
<hr/>							

Figure 16 Detail from the map in Figure 8 showing improvements at the Gooandra Run by 1890.

Initial snow lease grants in the immediate vicinity of Gooandra were to Walter Witts (SL15 2,410 acres), Henry Witts (SL18 3500 acres and SL19 5,130 acres) and Alexander McKeahnne (SL20 4,400 acres) (*New South Wales Government Gazette* 13 Feb 1891 (106): 1256). Snow Lease 20 was transferred from McKeahnne to the Scottish Australian Investment Company (Limited), which together with Henry Witts at SL19 forfeited their leases due to non-payment of rent in 1897 (*New South Wales Government Gazette* 13 November 1897 (903): 8247). Snow Lease 18 passed from Witts to Charles John Wildash in 1901 (*Government Gazette of the State of New South Wales* 27 April 1901 (352): 3384).

In 1903 two areas at Gooandra were proclaimed as scrub lands, specifically Scrub Lease 194 (at 3,340 acres practically all of Snow Lease 18) and Scrub Lease 179 which at 13,828 acres encompassed a considerable area partly within the Long Plain Holding No. 95, including Snow Leases 19, 20 and part 15 (*Government Gazette of the State of New South Wales* 21 November 1903 (606): 8563; 21 November 1908 (144): 6809; 22 December 1909 (163): 6839). At this stage, land deemed unimproved 'scrub' – such as the terrain supporting stands or regrowth of ribbon gum, mountain ash and messmate at Gooandra - was available in comparatively large lease areas of up to several thousand acres (O'Connor 2004: 15). Scrub Lease 194 was initially granted to the trustees in the estate of the late William Bradley before eventually coming into the possession of Hector Oltman Lampe (*Government Gazette of the State*

of *New South Wales* 30 December 1904 (702): 9480; 11 December 1925 (164): 5564). The substantially larger Scrub Lease 179 was granted to Henry Frederick Lampe in late 1903 (*Government Gazette of the State of New South Wales* 21 November 1903 (606): 8579). H.F. Lampe's procurement of the scrub lease was part of a series of acquisitions of parcels of property across the adjacent high country between the upper Murrumbidgee and Tantangara Mountain and very much in keeping with the contemporary trend set by well-placed graziers taking advantage of the scrub lease system in order to gain possession of very large tracts of land (Higgins and Scott 1991; O'Connor 2004: 15). In addition to Gooandra, Lampe obtained leases on several blocks amounting to almost 13,000 acres on the Tantangara Run directly to the east and held title to several parts of that property well into the late 1930s and early 1940s (see the Tantangara Run section below).

Lampe's acquisition of Gooandra appears to have been a catalyst for an acceleration in development of the run; in accordance with conditions set on the scrub lease grants, major construction of dog-proof fencing was commenced in cooperation with holders of the adjoining Scrub Lease 194 in 1903 and by May 1904, 2,603 acres had been ringbarked (Higgins and Scott 1991). The aforementioned 1800s miners' hut located in the lee of Yankee Ridge in SL20 became the base for operations on Gooandra, this timber slab structure being augmented by the addition of a three-roomed weatherboard house relocated from the Yarrangobilly Road in 1913/14. The 1898 Gooandra Parish Map shows a proposed 6 wire fence demarcating the future homestead block encompassing the headwaters of a northward-draining creek line in Snow Lease 20 (Figure 17). Higgins and Scott (1991) trace the following evolution of the Gooandra Homestead complex:

- 1903-1913/14: c. 1860s miners' hut (horizontal timber slab walls, shingle roof, timber floor, rubble fireplace, dirt-floor verandah) utilised in conjunction with two large tents;
- 1913/14: three bedroom weatherboard house with corrugated iron roof, pane glass windows, hallway and verandah (formally occupied by the Chave family) transported to the site; a brick and stone fireplace was subsequently added. At the same time an additional two room weatherboard hut with an iron roof was built nearby;
- 1914: the cottage was linked to Kiandra via a telephone line that followed existing fences and was supported by high strainer posts at 100 metre spacing;
- 1916: a timber-framed, iron-clad six-stand wool/crutching shed was built to the north-west of the main complex; and
- c. 1917: a brick bread oven was added to the old miners' hut along with a weatherboard clad, tin roofed twin-hole pit toilet; a vegetable garden was created towards the yards.

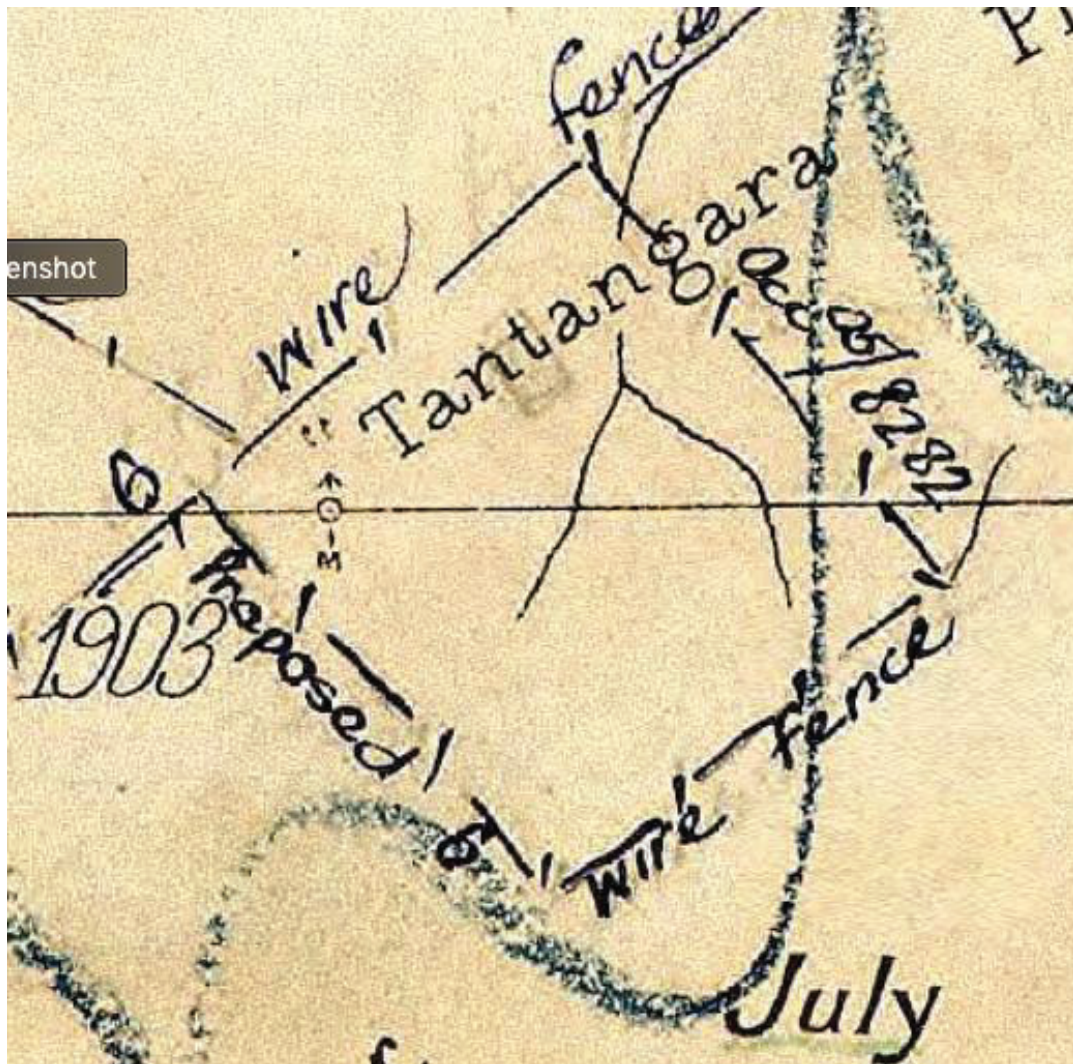


Figure 17 Detail from the Gooandra Parish Map 1898 2nd Ed.

Wally Kell who worked on Gooandra in the early-mid twentieth century when it belonged to A.W. Austin, and Lampe was still 'looking after' the place, described the station as follows:

When I went there, there was the old two-roomed place for a kitchen. The old original slab hut. The other house was the four rooms with a hall through it. And two skillion rooms on the back verandah. A little porch between the two rooms, that's where we used to camp. Then there was a saddle shed between there and the shearing shed with two, one big room, like a weatherboard construction, and that's where the shearer's quarters were. There was a shearing shed up behind and the yards around it. That was a beautiful shed, the timber must've been thirty, forty foot long, beautiful timber.

(in Huenneke 2005: 97-98)

Not mentioned or described in historical sources but appearing on the plan of the adjacent Tantangara Run (date of map unknown) is a small ‘Cattle Station’ on the

western side of Tantangara Creek within Snow Lease 18 (Figure 18). The provenance of this feature is not immediately discernible on the map as numerous consecutive alterations to its text are apparent over time. It is not listed as one of the improvements noted for the block on the 1890 snow lease plan, nor is it included in a later assessment for a 1929 evaluation (*Government Gazette of the State of New South Wales* 19 July 1929 (95): 3109). Given its connotation with cattle rather than sheep and its comparatively remote location, it is possible that this structure may have constituted a hut associated with the earlier phase of pastoral landscape use of the area, perhaps a shepherd's shelter on part of the Long Plain Run.

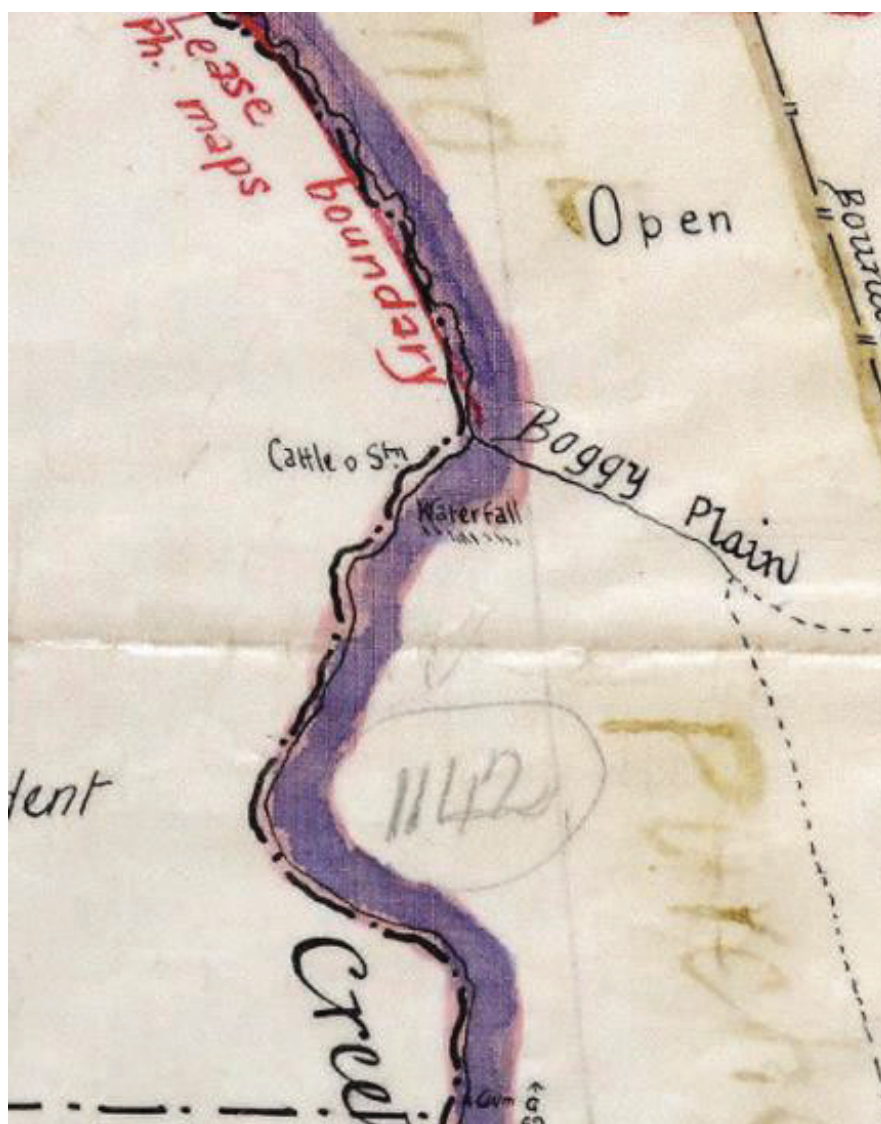


Figure 18 Tantangara Run/Holding map: 'Tantangara Run, County of Wallace (date unknown).

For the early part of the twentieth century, the Gooandra Run was synonymous with the Lampe family, the title of the holding as a pastoral entity being most commonly attributed to Henry Frederick's period of tenure (*The Tumut and Adelong Times* 2

October 1945). During this phase the economic benefits of summer grazing and the quality of the pasture within Lampe's holdings were commonly cited in the press; large mobs of sheep are recorded as having been moved to Gooandra from as far afield as the Riverina, Coonamble, Brewarrina and Moree (*Mudgee Guardian and North-Western Representative* 19 March 1908; *The Riverine Grazier* 30 September 1910; *The Tumut Advocate and Farmer's and Settlers' Adviser* 18 March 1913; 3 December 1918) and at one stage two mobs each of 45,000 crossbreds were sent up from Bringagee Station near Carrathool (*The Tumut and Adelong Times* 7 December 1916). It is interesting to note that the toponym 'Yankee Ridge' was also in relatively common usage at this stage as an alternative to 'Gooandra' (*The Gundagai Independent and Pastoral, Agricultural and Mining Advocate* 23 April 1903; *The Tumut Advocate and Farmers and Settlers' Adviser* 17 December 1918).

In 1925, the area falling within Snow Lease 20 at Gooandra passed from Lampe to A.W., A.S. and E.G. Austin (*Government Gazette of the State of New South Wales* 27 November 1925 (158): 5335). Sheep belonging to the Austin Pastoral Company had long been run on the property during the summer months under Lampe's management and this arrangement continued with Lampe utilising the Gooandra Homestead complex as a base from which also he ran his concerns on the adjacent Tantangara Holding. As was the case for the adjacent Tantangara Run, at this time the four original snow leases associated with Gooandra had been divided into 'new' leasehold blocks: 'A' (5600 acres, comprising parts SL20 and SL19), 'D' (5,300 acres, parts SL19 and SL15), 'X' (3,300 acres, SL18) and part 'C' (part SL20, now incorporated into the former SL21 on Long Plain), later illustrated in a 1932 plan (Figure 12). While block A was granted to the Austin trusteeship, block D was leased to Anthony Brunskill (*Government Gazette of the State of New South Wales* 27 November 1925 (158): 5335). Snow Lease 18/Scrub Lease 194 was transferred to Henry Frederick Lampe's son Hector Oltman Lampe as Block X in 1929 (*The Manaro Mercury, and Cooma and Bombala Advertiser* 9 September 1929). The family connection between lease areas and the running of the Gooandra property is apparent in the valuation of improvements on Block A which were stated as 'fencing, ringbarking, woolshed, house, sheds, yards, &c., of an approximated value of £1,235, partly Crown property and partly property of outgoing lessee, and partly by adjoining lessee' (*Government Gazette of the State of New South Wales* 4 September 1925 (118): 3856).

In 1931, Anthony Brunskill forfeited his tenure at Block D for non-payment of rent and it was taken up as a nine year lease by William Henry Stanley Glasscock, John Raymond Greves and John Alexander McInerny (*Government Gazette of the State of New South Wales* 11 September 1931 (120): 3165); 14 September 1934 (174): 3425). The Austin and Lampe leases at blocks A and X respectively were extended through the 1930s (*Government Gazette of the State of New South Wales* 1933 (127): 3063). The retention of such large tracts of land in the high country by small groups of more affluent graziers such as Lampe and the Austin group had attracted significant

criticism from local families over the years and by the 1930s the issue had become politically charged. Lampe and other snow lease holders of long standing came under scrutiny for sub-leasing blocks and allegedly benefitting from preferential treatment in the lease bidding process (*The Labor Daily* 27 November 1936) and official action was eventually undertaken to move the lessees from the western districts out of the high country in order to provide local settlers with opportunities to utilise the mountains (O'Connor 2004: 16). Snow lease boundaries were again redrafted into smaller and more numerous leases and permissive occupancies; by 1943 six blocks on the Gooandra Run were released for tender, comprising 'A' (1,680 acres), 'D' (2,100 acres), 'P10' (1,850 acres), 'Q10' (1,890 acres), 'R10' (2,040 acres) and 'X' (1,520 acres) (*Government Gazette of the State of New South Wales* 3 September 1943 (99): 1540, 1542) (Figure 19). This year marked the expiration of the Lampe and Austin leases and the end of those families' dominance in the local 'summer country'.

While the smaller snow leases and permissive occupancies were partly created in order to allow local land holders to gain access to country in the snow belt, their release also signalled the introduction of tighter conditions on the tenure and management of the land. Post-1943 grants were for seven-year terms and came with obligations to maintain strictly set limits on stocking levels, periods of grazing and timber harvesting as well as the enactment of heavy rabbit control programs (*The Farmer and Settler* 6 August 1943; *Goulburn Evening Post* 13 September 1943). These parameters were not only in keeping with the ongoing management of parts of the local high country as falling within the Burrinjuck Dam Catchment Area (Notified on the 16th of August 1911) and under the more recent Section 21 of the Soil Conservation Act of 1938, but also reflected concerns of water purity and conservation measures associated with the evolving Kosciusko National Park and Snowy Hydro Scheme.

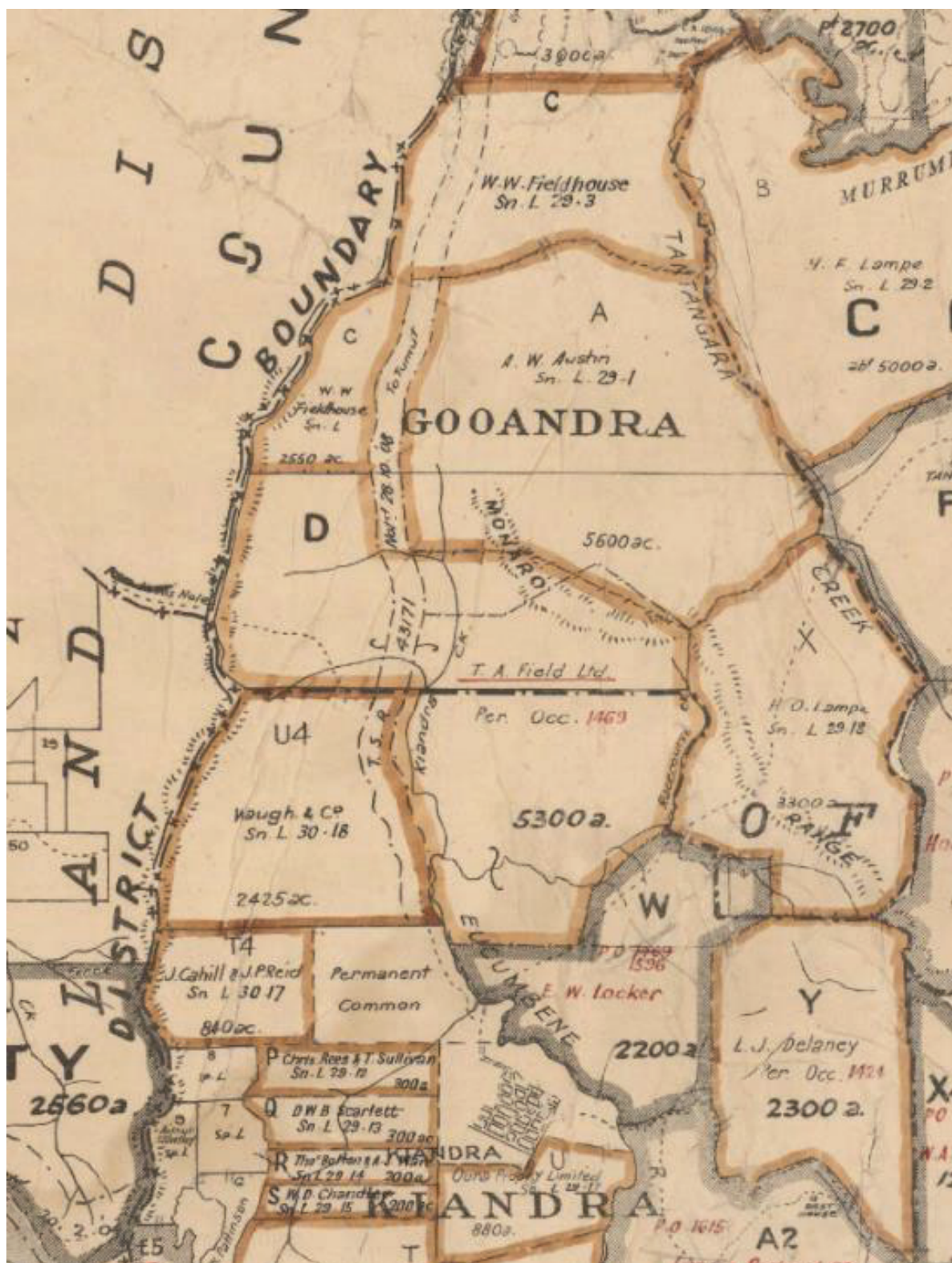


Figure 19 Excerpt from Counties of Buccleuch, Cowley, Selwyn and Wallace: Land Districts of Queanbeyan, Cooma, Tumut and Tumbarumba: 3 snow leases, 28 permissive occupancies (Lithograph No. 1)'. Department of Lands, Sydney New South Wales 1932.

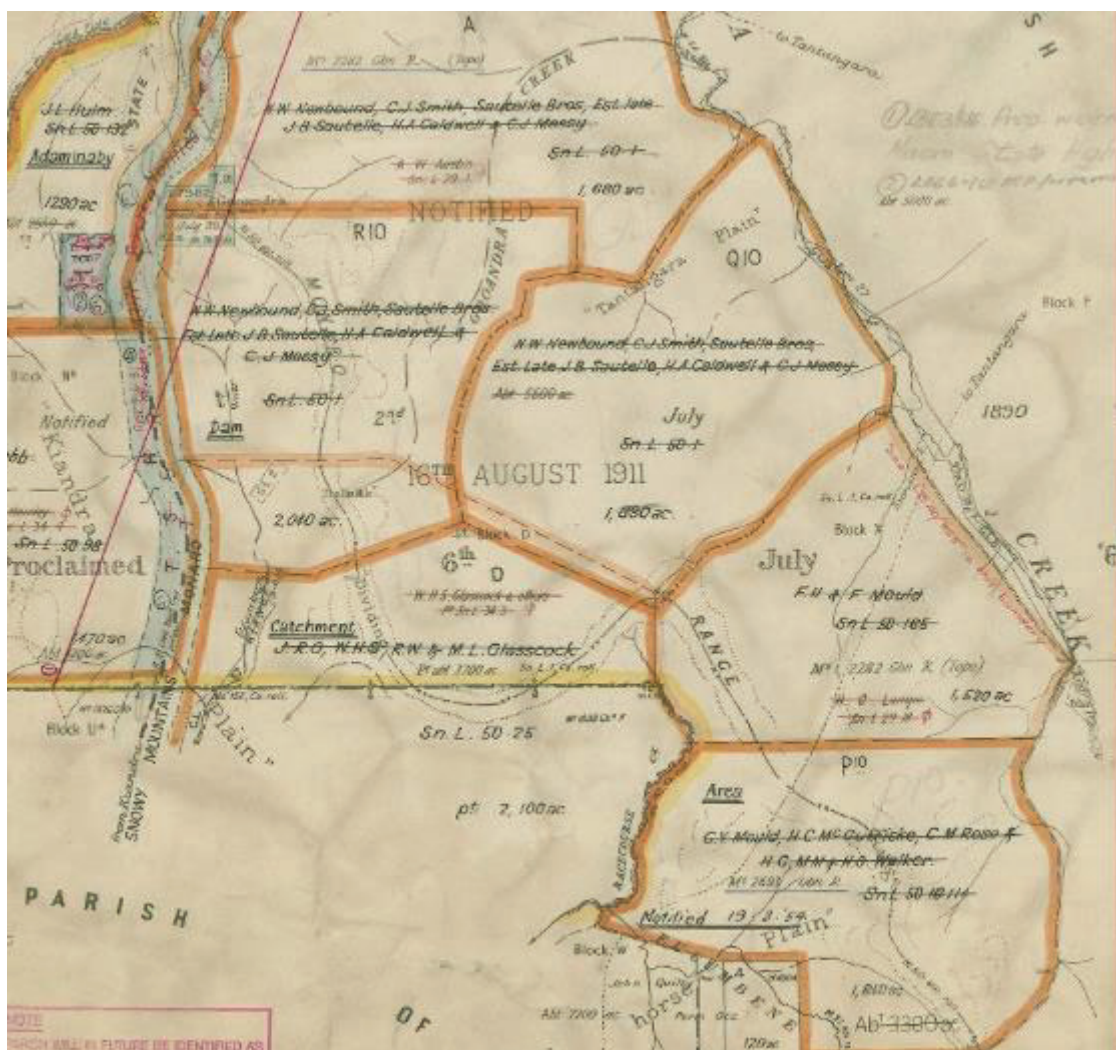


Figure 20 Excerpt from Gooandra Parish Map 1938 4th Ed.

The 1943 grants of leases at Gooandra were made to a number of syndicates from the Monaro region (Higgins and Scott 1991) and included:

- Blocks A, Q10 and R10 – H.A. Caldwell, J.B. & M.B. Sautelle, Estate of the late J.B. Sautelle, C.H.S. Walsh and C.J. Massy (*Government Gazette of the State of New South Wales* 26 November 1943 (135): 2085).
- Block D – W.H.S., J.R.G. & M.L. Glasscock (*Government Gazette of the State of New South Wales* 26 November 1943 (135): 2086).
- Block P10 – G.Y. Mould, C.E.R. Pryce, H.C. McGufficke, C.M. Rose, H.G. Walker & H.S. Walker (*Government Gazette of the State of New South Wales* 26 November 1943 (135): 2087).
- Block X – F., F.H., F.E. Mould & the Estate of J. Wellsmore (*Government Gazette of the State of New South Wales* 26 November 1943 (135): 2087).

Release of the blocks at the seven year expiration of the 1943 leases shows the following lists of improvements on the Gooandra run in 1950 (from the *Government*

Gazette of the State of New South Wales 1 September 1950 (143): 2724, 2725, 2730, 2731, 2733):

- Block A – Fencing
- Block D – With hut, horse paddock, sheep yards and fencing.
- Block P10 – Fencing
- Block Q10 – Fencing, hut and cottage (Gooandra Homestead complex)
- Block R10 – Fencing, shed and yards.
- Block X – Fencing

Grants for the year 1951 appear to have been slight variations on the previous holding syndicates:

- Blocks A, Q10 and R10 – N.W. Newbound, C.J. Smith, Sautelle Bros, Estate of the late J.B. Sautelle, H.A. Caldwell, & C.J. Massy (*Government Gazette of the State of New South Wales* 19 January 1951 (9): 153).
- Block D – W.H.S., J.R.G., R.W. & M.L. Glasscock (*Government Gazette of the State of New South Wales* 19 January 1951 (9): 154).
- Block P10 – G.Y. Mould, H.C. McGufficke, C.M. Rose, M.M. Walker & H.S. Walker (*Government Gazette of the State of New South Wales* 19 January 1951 (9): 158).
- Block X – F.H. Mould & F. Mould (*Government Gazette of the State of New South Wales* 19 January 1951 (9): 160).

The final release of the blocks, now permissive occupancies, was made in 1957 (*Government Gazette of the State of New South Wales* 19 January 1957 (109): 3022, 3023, 3027, 3028). Gooandra was prohibited to grazing by 1967 (Higgins and Scott 1991).

The Tantangara Run

It would gladden the eyes of you denizens of Gundagai, who have now to contemplate your brown, dusty, flats covered with scanty parched stubble and dry thistle stalks, to see the luxuriant grass on the Long Plain and at Tantangara, and the clover growing along the track. (*The Gundagai Times and Tumut, Adelong and Murrumbidgee District Advertiser* 2 January 1869).

By virtue of its geographical situation and the nature of the local European occupation, this holding very much shares a joint history with Gooandra. Originally constituting approximately 40,000 acres, Run No. 62 ‘Tantangara or Gulph’ was demarcated in the late 1860s as:

The Crown Lands within the following boundaries: Commencing on the south side of the Murrumbidgee, at the lower end of Kelly’s Plain, where the Nangar Range terminates on the river near the Gulph; and bounded on the east by that range for about 8 miles; on the south about 6 miles by the range which divides the waters of the Snowy River from those of the Murrumbidgee; on the west by the Tantangara Creek, about 9 miles, to its

junction with the Murrumbidgee; on the north by the Murrumbidgee to the point of commencement. Rent - £63 (*New South Wales Government Gazette* 23 April 1868 (96): 1148).

As such, Tantangara comprises a natural eastern extension of the Gooandra run, taking in much of the Murrumbidgee frontage between Tantangara Creek and the Nungar Range (Figure 21).



Figure 21 Map of the Pastoral Run Tantangara. Age unknown, c. before 1890s (NSW Land Registry Services Map No. 572399).

As was almost certainly the case with Gooandra, it can be assumed that the extensive open and grassy Tantangara Plains had attracted graziers during the

warmer months of the early to mid-1800s and most likely well prior to the 1840s. Tom Wilkinson, who ran cattle at Yallowin Run in the Blowering Valley in the mid-1800s, noted Tantangara as one of four stations that had been established then abandoned by 1840 ‘on account of the snow’ (the others being Long Plain, Coolamon and Currangorambla) (*Albury Banner and Wodonga Express* 22 July 1904). Official documentation indicates the run as being recognised and leased by May 1851 as two tenderers for the Crown Land lease on this date, Messrs William Sherwin and H.J.A. Taylor, were notified as rejected to this effect in the *New South Wales Government Gazette* (28 August 1862 (150): 1624). A similarly early mention occurs as a notification of a vacated run of 9,600 acres known as “The Gulf”, a parcel of country between Nungar Creek and Nungar Ridge including what would soon thereafter become the easternmost part of Tantangara (*New South Wales Government Gazette* 30 January 1850 (14): 168). From this early phase the Tantangara Run would become largely synonymous with what was also known as ‘The Gulf’ or ‘Gulph’.

In a letter published in *The Sydney Morning Herald* on the 15th of March 1860, one John Richards relates the delivery of 8,000 sheep to the overseer of the station on Tantangara Plains and provides basic details of the route with distances in miles from Merimbula to the diggings at Kiandra. The correspondence also describes the successful navigation to Tantangara through often boggy country ‘where never a dray was before’ by a ten-bullock dray laden with 32cwt of supplies and in the company of several thousand sheep. Taking into account the author’s focus upon providing directions specifically from the far south coast, it is likely that he engaged in the undertaking directly on behalf of the Twofold Bay Company, an enterprise that was running sheep on Tantangara under the management of a Mr. Samuels at the time (*The Sydney Morning Herald* 17 January 1860).

By the mid-1860s, demand for summer runs in the local country was high; in 1865 John Cochran purchased at least part of Tantangara and the Gulf as part of Long Plain and put out contracts to have huts, yards and other infrastructure erected on the runs (*The Tumut and Adelong Times* 19 October 1865). Three years later the entire run of what was then 40,000 acres or 63 square miles was listed as unstocked before being sold to Waller and Gorton of Cuba Run near Darlington Point (*The Sydney Morning Herald* 9 October 1868; *Wagga Wagga Advertiser and Riverina Reporter* 21 October 1868, 28 November 1868). These partners were running 20,000 sheep from western plains stations on Tantangara/Gulph in the summer of 1868/1869 with an aim to possibly keep stock there year-round given the dry conditions in the lowlands (*The Goulburn Herald and Chronicle* 20 January 1869).

An element of interest arising from Waller and Gorton’s tenure is the mention in the press of the existence of ‘Head Stations’ on Tantangara and Gulph prior to 1870 (*The Manaro Mercury, and Cooma and Bombala Advertiser* 19 February 1869). It is unclear precisely when the original Tantangara Homestead was built and which

occupier was responsible for its construction; given that the run was being operated by a resident manager with at least one shepherd in his employ at the beginning of 1860 (*The Sydney Morning Herald* 17 January 1860; *Illawarra Mercury* 16 March 1860), it is very likely that some form of farmhouse with outbuildings had been erected some years before Cochran's intention to develop. The earliest available map of the pastoral run, a true palimpsest of sequential Crown Land information (Figure 22), plots a homestead and horse paddock with later yards just to the north of Blanket Plain (Figure 23). As with the Gooandra Homestead complex, some level of architectural evolution must be expected to have occurred in and around the homestead precinct, resulting by the 1880s in what has been described as a large farmhouse with four bedrooms and a hall (KHA site description). While this homestead was regarded as old in the early twentieth century and had deteriorated to an uninhabitable state by the late 1920s (*Smith's Weekly* 21 May 1921; Higgins & Scott 1991), a standing structure was still apparent in the 1960s (KHA site description). This may have been the 'hut' at 'top Tantangara' that Tom Taylor of Currango Station stated had finally been destroyed by fire in about 1966 (Hedge 1968: 220). The extant Witses (or Witzes) Hut on the south side of the same plain is known to have been built in 1952 making use of materials sourced from the earlier homestead which has been cited simply as having been nearby (KHA site description), probably on the north side of the main creek crossing.

Tantangara/Gulph passed through several phases of ownership or leasehold during the course of the 1870s and 1880s, the sequence of events conveying the impression that some sub-leasing of various portions of the run was also being undertaken. Portions of the run under J. Robertson and J. Cochran were transferred to Waller between 1870 and 1873 (*Manaro Mercury*, and *Cooma and Bombala Advertiser* 2 July 1870; *Australian Town and Country Journal* 21 January 1871; *New South Wales Government Gazette* 26 May 1873 (142): 1512) before the station as a whole was sold to A.T. Gibson in April 1876 (*New South Wales Government Gazette* 25 April 1876 (130): 1631). In December that same year the Gibson partnership dissolved, and the unstocked run was put up for sale and bought up as 'unimproved' country the following month for £1550 (*Wagga Wagga Advertiser* 6 December 1876; *The Goulburn Herald and Chronicle* 6 January 1877). A final portion still belonging to Gibson was sold to H. Edwards in December 1878 (*The Sydney Morning Herald* 25 December 1878). Through the first half of the 1880s the majority of the run came under the ownership of Stephen White of Merribindinyah near Bethungra (*The Gundagai Times and Tumut, Adelong and Murrumbidgee District Advertiser* 19 May 1882; *New South Wales Government Gazette* 31 October 1883 (447): 5902) who then sold to Messrs. L.F. Parsons and J. Dill of Tagimbie (*Wagga Wagga Advertiser* 28 April 1885). Parsons and Dill remained the licensee for between 12,280 and 14,900 acres of Tantangara for several years following, with the resumed part of the run in the south largely taken up by the executors of the late William Bradley (*New South*

Wales Government Gazette 23 June 1891 (397): 4611; 31 October 1891 (696): 8728;
30 September 1896 (780): 6866).



Figure 22 1890 Plan of snow leases lots numbered 11 to 31 inclusive, parishes of Gooandra, Kiandra, Nungar & Tantangara, County of Wallace, and district of Cooma.

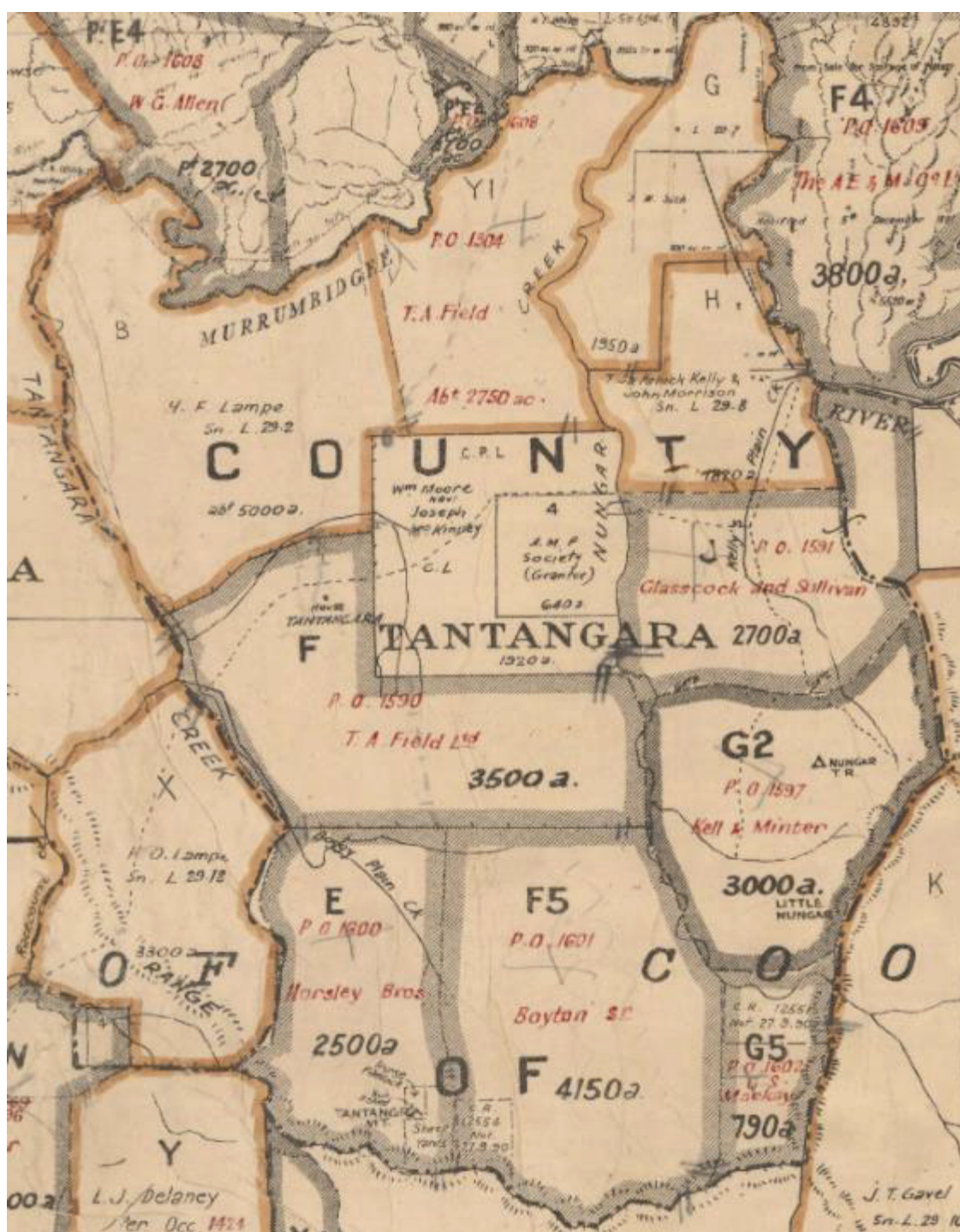


Figure 23 Detail from lithograph showing conditional purchase and snow lease boundaries on the Tantangara Holding in 1932 (from *Counties of Buccleuch, Cowley, Selwyn and Wallace: Land Districts of Queanbeyan, Cooma, Tumut and Tumbarumba: 3 Snow Leases 28 Permissive Occupancies New South Wales Department of Lands, Sydney*).

The early 1880s also saw the division of parcels of some of the run into comparatively smaller leasehold blocks. To the east of Blanket Plain and the Tantangara homestead, William Moore is shown to have obtained a conditional lease of 1,920 acres and a conditional purchase of 640 acres (Figure 25; *Goulburn Evening Penny Post* 19 June 1886). Further to the north-east, a series of blocks fronting the Murrumbidgee River are also shown including at the northern tip of Snow Lease 28 a 710 acre Village Reserve (V.R. 635) shortly thereafter appended to a reserve for camping and other purposes (*The Manaro Mercury, and Cooma and Bombala Advertiser* 3 December 1881) and below it three portions totalling 1,340 acres held by W. Pearce (140 acres) and S.T. Grady (1,200 acres). In this area Stephen Thomas Grady of Adaminaby is recorded as having acquired on conditional purchase a series of 600 acre blocks totalling 1,800 acres on the Gulph run in 1882 (*The Manaro Mercury, and Cooma and Bombala Advertiser* 18 February 1882). On the map of the Tantangara Run, a sheep station and yards are shown on the northernmost 600 acre lot of Grady's holding (No.1, Figure 24), the identity and origin of which are problematic. One potential explanation is that the structures may have been erected by Grady in response to conditional purchase conditions that the selector must reside on the land falling under the lease, however, no information supporting this hypothesis is apparent in the available records. Construction following Grady's tenure may be attributable to several subsequent lessees after 1893 when H.T. Edwards next took up the lease. At the time the homestead was built it would have occupied a comparatively open position on the Murrumbidgee River plain, a zone that now falls beneath the waters of the Tantangara Reservoir.

With the introduction of the officially regulated Snow Lease system, Tantangara became a holding composed of Snow Leases 22-31 inclusive, totalling 26,680 acres (*New South Wales Government Gazette* 12 December 1890 (714): 9500) (Figure 26). Between 1891 and 1908, all had been taken up (*New South Wales Government Gazette* 30 January 1891 (72): 896; 13 February 1891 (106): 1256; 27 April 1901 (352): 3384; 13 July 1901 (598): 5446; 17 January 1903 (32): 421; 2 October 1907 (127): 5569; 28 October 1908 (122): 5702; see also Tantangara Parish Map 1898 2nd Edition).

Original or very early holders of Tantangara snow leases included:

- SLs 22 (2300 acres) and 23 (3000 acres) – Executors of the Late William Bradley (1891);
- SL 24 (3440 acres) – Charles John Wildash (1901);
- SLs 25 (3370 acres) and 26 (4030 acres) – H. Lampe (1907);
- SL 27 (2480 acres) – H.T. Edwards (1891), Alexander Caldwell (1901);
- SL 28 (1950 acres) – H.T. Edwards (1891);
- SL 29 (1820 acres) – T.J. and P. Kelly (1903), T.J. and P. Kelly and Edmund Morrison (1906);
- SL 30 (2190 acres) – Everard Gregory Crace (1901); and

- SL 31 (3000 acres) – Alexander Joseph McDonald (1908), William Kell (1909).

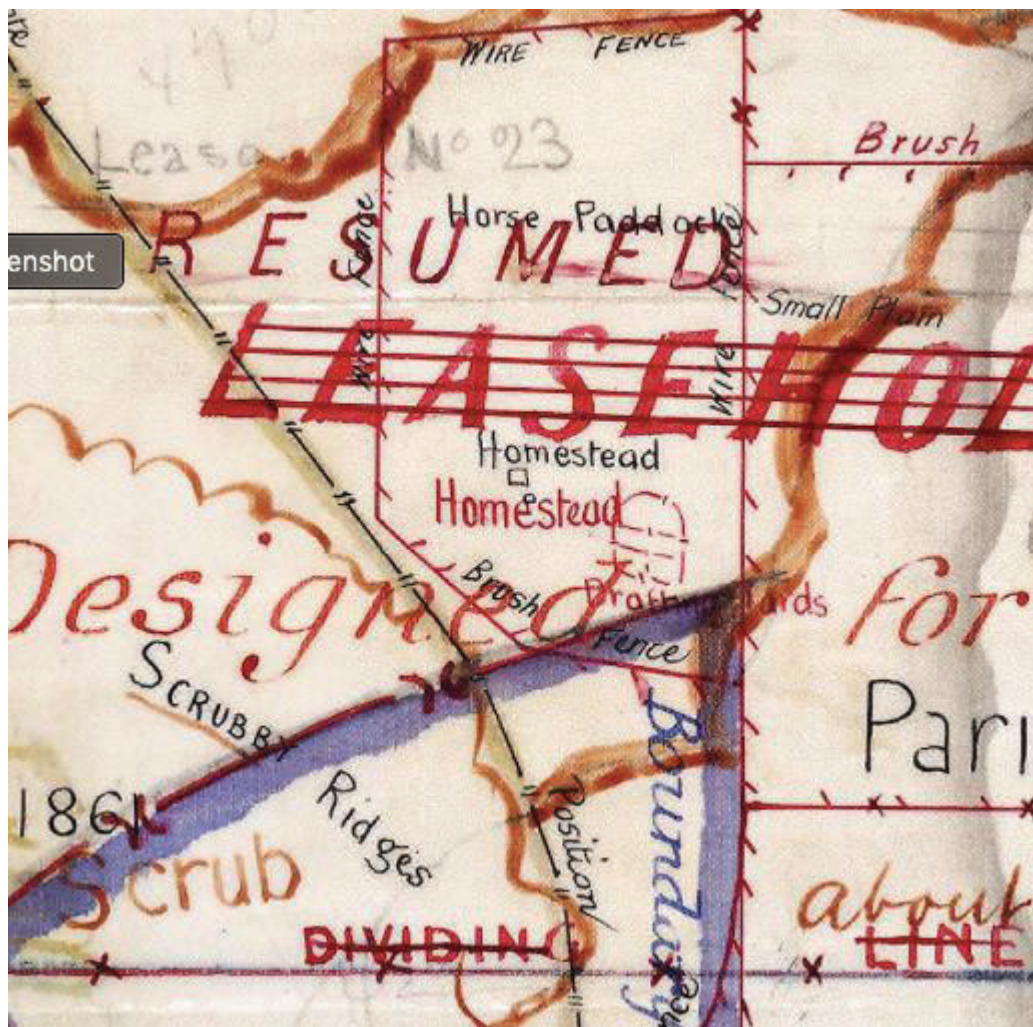


Figure 24 Location of Tantangara Homestead.



Figure 25 Conditional Purchase held by William Moore.

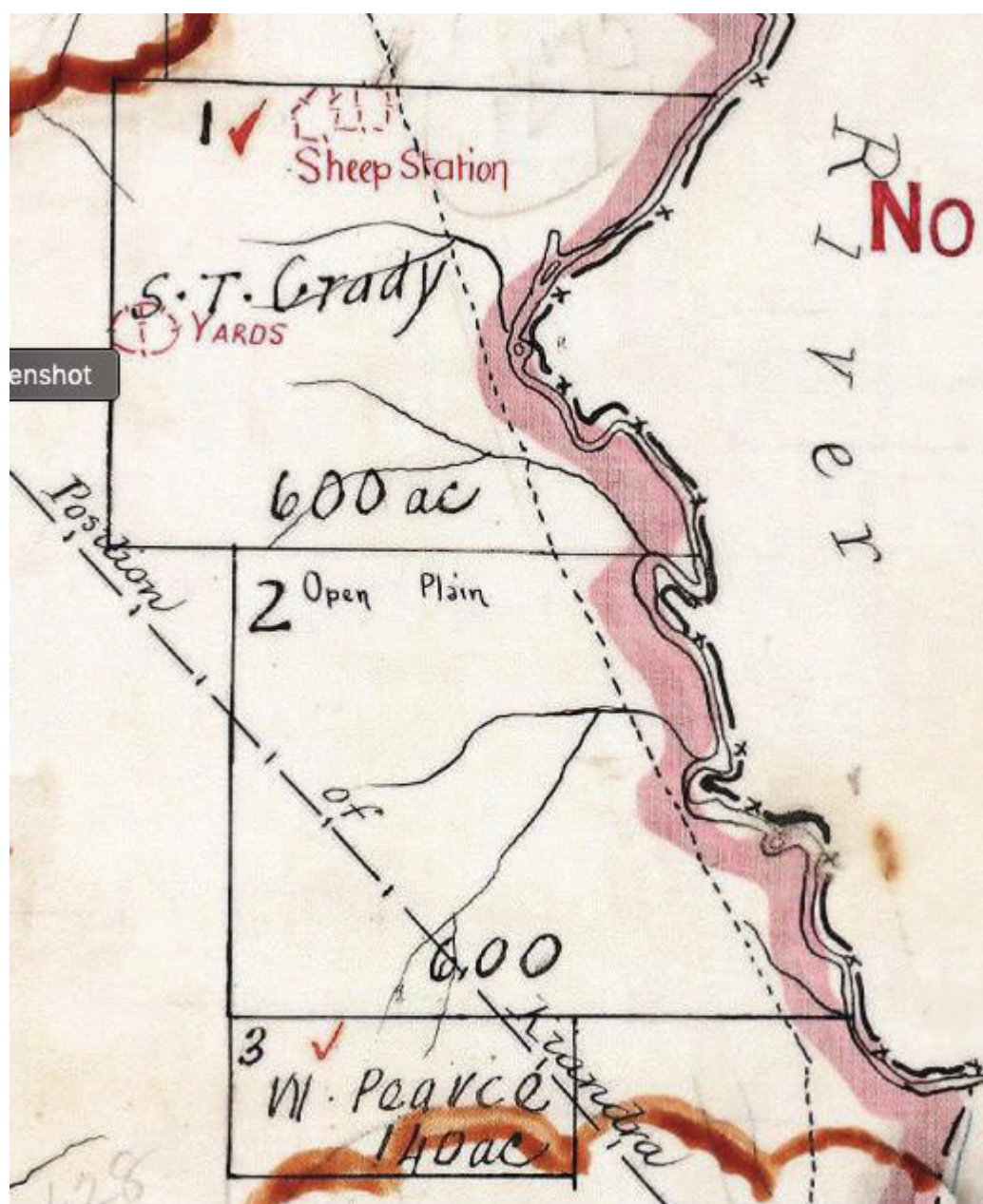


Figure 26 Conditional Purchase blocks along the Murrumbidgee River valley including the ones held by S.T. Grady.

An indicative compilation of Tantangara snow lease holders spanning the period from the 1890s to the late 1920s is given in Table 7.

Table 7 Indicative compilation of Tantangara snow lease holders spanning the period from the 1890s to the late 1920s.

Snow Lease No.	Holder	Date/s	Notes
22	Executors of the late William Bradley	1891-1905	

Snow Lease No.	Holder	Date/s	Notes
	Trustees in the Estate of the late William Bradley	1905-1925	
	H.F. Lampe	1929-1932; 1933-1943	
23	Executors of the late William Bradley	1891-1905	
	H.F. Lampe	19(?)	
24	Charles John Wildash	1901	
	A.H.P. Watts	1929	Permissive Occupancy
	G.W. Smith	1929	
25	H.F. Lampe	1907-1914	
	A.J. Austin	1914	Permissive Occupancy
	W.V. Schiller	To 1929	Permissive Occupancy
	J.K. & I.K. Russell	1929	
26	H.F. Lampe	1907-1914	
	A.J. Austin	1914	Permissive Occupancy
	W.V. Schiller	To 1929	Permissive Occupancy
	J.K. & I.K. Russell	1929	
27	H.T. Edwards	1891-1901	
	Alex Caldwell	1901-1905(?)	
	Trustees in the Estate of the late William Bradley	1905	
	E. Armstrong, C.W. & B.H. Lampe, Henry Crowe	1929-1930	Permissive Occupancy
	T.A. Field	1930	
28	H.T. Edwards	1891-1903	
	Trustees in the Estate of the late William Bradley	1905	
	J.W. Smith	1929	
29	T.J. Kelly & P. Kelly	1903-1906	
	T.J. Kelly, P. Kelly & Edmund Morrison	1906	
	J. Morrison, T.J. and P. Kelly	1929	
30	E.G. Crace	1901	
	J. McKinney	To 1929	
	H.J. Sullivan, S.G. & J.R. Glasscock	1929	
31	A.J. McDonald	1908-1909	
	W. Kell	1909	Permissive Occupancy
	W. Kell & B. Minter	1930	Permissive Occupancy
C.L. 4789	William Moore	1886	Conditional Lease 1920 acres
C.P. 82	William Moore	1886	Conditional Purchase 640 acres
	A.M.P. Society Ltd.		

Some other notable changes in the tenure and zoning of land on Tantangara that took place during this period included the notification of four Crown Reserves in September 1890 at the boundaries of SLs 24 (C.R. 12552), 26 (C.R. 12554 and C.R. 12551) and 30 (C.R. 12553), with a Trig Reserve (T.R 26923) of 70 acres established on the peak of Nungar; and after the turn of the century in the years 1904 and 1906, 14,990 acres of the holding (Snow Leases 22, 23, 24, 27, 28 and 29) were declared scrub land (*New South Wales Government Gazette* 31 August 1904 (486): 6555; 2 May 1906 (151): 2555). In later years, two timber reserves would also be defined on the run: R57260 of 527 acres in SL26 (notified in 1926) and R57265 of 425 acres in SL24 (notified in 1927) (*NSW Government Gazette* 22 October 1926 (137: 4489; 28 January 1927 (11): 597).

Issues of water catchment management were also to have some influence on the holding. With the initiation of the Barren Jack Dam construction project and the subsequent implementation of the *Murrumbidgee Irrigation Act* of 1910, the Tantangara Run became notified as falling within the Burrinjuck Catchment Area on the 16th of August 1911 (*Government Gazette of the State of New South Wales* 16 August 1911 (107): 4439; see also Tantangara Parish Map 1898 2nd Ed.). Prior to this, the Murrumbidgee valley falling within the boundaries of the run had been the subject of some assessment and survey as part of an investigation into the viability of damming the river to store water for a major flow management scheme. This proposal was aired in the local press in the mid-1880s:

Instructions have been given to Mr. E. Haylock, licensed surveyor, to make a survey which will determine the practicability of diverting the waters of the Snowy River into the Murrumbidgee, and of storing a large body of water at Tantangara Plain, situated at the head of the Murrumbidgee River. (*The Gundagai Times and Tumut, Adelong and Murrumbidgee District Advertiser* 23 January 1885).

The proposal was based on the premise of diverting flow from the Snowy River into the Murrumbidgee via a canal, with a dam wall approximately 84 feet high and 460 feet long impounding water within the Tantangara basin. A reservoir six and a half miles long containing over 15,000 million gallons and affording a supply of 200 cubic feet of water per second for 140 days was envisaged (*The Daily Telegraph* 11 April 1885; *The Sydney Morning Herald* 18 December 1885; *The Riverine Herald* 8 January 1886). The subject of a Royal Commission, the viability of this proposal continued to be aired into the turn of the century prior to the implementation of the Burrinjuck Dam project (*Australian Town and Country Journal* 23 October 1897; *Evening News* 23 July 1903).

The end of the 1920s saw further alterations to the tenure of land on Tantangara, namely the conversion of the existing ten snow leases into three snow leases, seven permissive occupancies and the conditional purchase lease roughly in the holding's centre; these allotments varied in size from 640 to 5,000 acres. In mid-1932 a

lithograph was produced by the New South Wales Department of Lands defining a list of permissive occupancies and snow leases available for tender in the Counties of Buccleuch, Cowley, Selwyn and Wallace. The various leases and occupancies falling within the boundaries of Tantangara on this document are shown in Figure 27. At this time six permissive occupancies comprising the centre and southern half of the original run's area were put up for tender including 'F' (former SL24, 3,500 acres), 'E' (parts of former SLs 25 & 26, 2,500 acres), 'F5' (parts former SLs 25 & 26, 4150 acres), 'G5' (the easternmost part of former SL26, 790 acres), 'G2' (former SL31, 3,000 acres), and 'J' (former SL30, 2,700 acres). The published details and descriptions of the advertised permissive occupancies appeared in the *New South Wales Government Gazette* (29 July 1932 (102): 2516-2518) and provide some indication of the level of improvement that had been made on Tantangara by that stage of history:

- F ... Fencing, ringbarking, value £180 9s 1d., Crown property. House, shed, fencing, £248 19s. 6d., not Crown property ... Hilly land of slate formation, poor grazing ridges; some plain, swampy land, and fair ringbarked ridges ...;
- J ... Boundary and other fencing and ringbarking, £337 9s. ... Undulating to steep, hilly country of granite and slate formation; plain country on frontage to Murrumbidgee River and creeks; scattered to thick gum, sallee, and mountain ash; fair to good grazing ...;
- G2 ... Boundary fencing, £139 15s., 1d. ... Mostly steep mountainous country of slate and granite formation, timbered with medium to thick gum and mountain ash; fair to very fair grazing ...;
- E ... Boundary fencing (Crown), £150 2s. ... Hilly country, of slate formation, part swampy plains and part thickly timbered hills; fairly good grazing land ...;
- F5 ... Boundary fencing (Crown) £180 8s. 7d. ... do (i.e. description as above); *and*
- G5 ... Boundary fencing (Crown), £134 8s. 2d. ... do (i.e. description as above).

From this information it is apparent that for much of the subject parts of the Tantangara landscape the levels of improvement for pastoral purposes had been minimal, limited mainly to basic fencing and some ringbarking of the lower-lying terrain; the exceptions here being the case of the Tantangara Homestead in C.P. 'F' and, shown on the plan at the south-east corner of C.P. 'E', a fenced paddock containing sheep yards, a horse paddock, hut and shed (Figure 27).

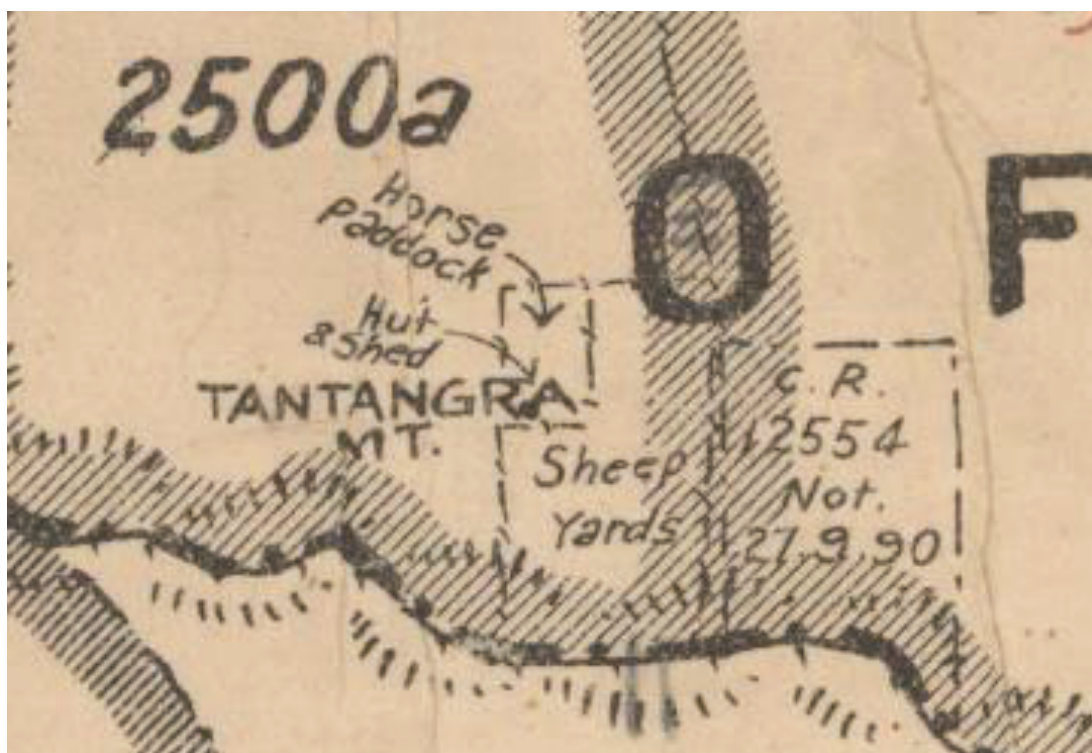


Figure 27 Detail from 1932 New South Wales Department of Lands Lithograph showing infrastructure at south-east corner of C.P. 'E'.

Subsequent government offers of snow leases and permissive occupancies over the following 26 years provide comparable information on the level of development experienced on the complete holding (Table 8). Through this final phase, subdivision of the older snow leases and subsequent permissive occupancies continued, ultimately resulting in the establishment of eighteen leases (1930 Parish Map). Definition of the new blocks in relation to the original snow leases is shown in Table 9.

Table 8 Original Snow Lease numbers and their relationship to later snow lease/permissive occupancy blocks.

Snow Lease No.	Post-1932 Block No.
22	Part U10
	Part B
23	Part U10
	Part B
	T10
24	F
	O10
25	E
	F5
	Part T11
26	Part T11
	L10

Snow Lease No.	Post-1932 Block No.
	G5
27	Y1
28	G
	Part H
29	Part H
	N10
30	J
	Part M10
31	G2
C.L. 4789/ C.P. 82	N1

An indication of holders of the leases over the Tantangara Run's later pastoral phase is given in Table 9. Division of the holding into a greater number of blocks with a correspondingly significant reduction in their size is a typical reflection of the Lands Department's revision of snow leases after 1944 in an attempt to reduce grazing intensity (O'Connor 2004: 16).

Table 9 Indication of holders of the leases over the Tantangara Run's later pastoral phase.

Snow Lease/ Permissive Occupancy No.	Holder	Date/s	Notes
U10	V.A.L. Caldwell	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 159
B	H. Hain and E.J. Hain	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 153
T10	H.A. Delhunty & Co.	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 159
F	G.W. Smith	1929-1931	Tantangara Parish Map 1930 4 th Ed.
	T.A. Field Ltd.	1931-1935	Tantangara Parish Map 1930 4 th Ed.
	H.E. Field Pty Ltd.	1935-1943	Tantangara Parish Map 1930 4 th Ed.
	R.W. Bulman & J.A. Jones	Nd	Tantangara Parish Map 1930 4 th Ed.
	R.W. Bulman & C.A. Butler	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 154
O10	G.W. Smith	1929-1931	Tantangara Parish Map 1930 4 th Ed.
	T.A. Field Ltd.	1931-1935	Tantangara Parish Map 1930 4 th Ed.
	H.E. Field Pty Ltd.	1935-1943	Tantangara Parish Map 1930 4 th Ed.
	S.G.W. Constance & A.B. Stone	1943(?)-1949	Tantangara Parish Map 1930 4 th Ed.

Snow Lease/ Permissive Occupancy No.	Holder	Date/s	Notes
	W.J. & J.A. Pollock	1949	Tantangara Parish Map 1930 4 th Ed.
E	W.W. & A.V. Horsley	1933-1943	<i>Gov. Gaz. NSW</i> 8 Sep 1933 (141): 3296
	C.W. McKoy	To 1949	Tantangara Parish Map 1930 4 th Ed.
	W.H. & L.E. Huggett	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 154
T11	Horsley Bros	c.1932	Tantangara Parish Map 1930 4 th Ed.
	W.W. & A.V. Horsley	Nd	Tantangara Parish Map 1930 4 th Ed.
	J.A. Sutton	Nd	Tantangara Parish Map 1930 4 th Ed.
	N.J. Lette	1951-1952	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 159; 15 Aug 1952 (161): 2966.
	H.G.R. Mansfield & V.M. Russell	1952	<i>Gov. Gaz. NSW</i> 5 Dec 1952 (263): 4471
L10	A.J. Ware	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 157
G5	G.S. Mackay	1934-1937	Tantangara Parish Map 1930 4 th Ed.
	C.H.S. Walsh	Nd	Tantangara Parish Map 1930 4 th Ed.
	R.E. Goodwin	Nd	Tantangara Parish Map 1930 4 th Ed.
	R.L. Brayshaw & E.A. Gottaas	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 155
F5	J.K. & I.K. Russell	1929	Tantangara Parish Map 1930 4 th Ed.
	Boyton Sr.	1932	Tantangara Parish Map 1930 4 th Ed.
	A.M. Kingston & N.F. & V.L. O'Neill	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 155
G2	Kell & Minter	1932	Tantangara Parish Map 1930 4 th Ed.
	J.A. Sutton, A. Brayshaw & E.A. Gottaas	1933-1943	<i>Gov. Gaz. NSW</i> 8 Sep 1933 (141): 3296
	A.H. Brayshaw & R.E. Goodwin	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 155

Snow Lease/ Permissive Occupancy No.	Holder	Date/s	Notes
M10	S. & J.R. Glasscock & H.J. Sullivan	1932-1933	Tantangara Parish Map 1930 4 th Ed.
	W.C. Crawford	Nd	Tantangara Parish Map 1930 4 th Ed.
	H.T. Oldfield	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 157
J	S. & J.R. Glasscock & H.J. Sullivan	To 1933	Tantangara Parish Map 1930 4 th Ed.
	Widgiewa Past Co. Ltd	1933-1943	<i>Gov. Gaz. NSW</i> 14 Sep 1934 (174): 3425
	A. McKinnon	Nd	Tantangara Parish Map 1930 4 th Ed.
	P. Kelly	To 1949	Tantangara Parish Map 1930 4 th Ed.
	T.D. Pierce	1951-1953	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 156; 4 Sept 1953 (152): 2815
	J.C. Mugridge & C.R. Spellman	1953-1954	Tantangara Parish Map 1930 4 th Ed.
N10	T.J. & P. Kelly & J. Morrison	1929	Tantangara Parish Map 1930 4 th Ed.
	M.C. & A.J. Morrison	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 157
H	T.J. & P. Kelly & J. Morrison	1933-1943	<i>Gov. Gaz. NSW</i> 8 Sep 1933 (141): 3297
	J.M. & C. Morrison	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 155
G	J.W. Smith	To 1943	Tantangara Parish Map 1930 4 th Ed.
	J.E. Cregan	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 155
Y1	T.A. Field Ltd.	1933-1943	<i>Gov. Gaz. NSW</i> 8 Sep 1933 (141): 3296
	W. & J. Cotter	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 160
N1	J. McKinney	1932	Tantangara Parish Map 1930 4 th Ed.
	T.G. McKinney	To 1950	Tantangara Parish Map 1930 4 th Ed.
	R.O. & E.M. Wellsmore	1951	<i>Gov. Gaz. NSW</i> 19 Jan 1951 (9): 157

Over the course of the Tantangara Run's pastoral history, most leases were for blocks of land that were basically fenced and where practicable, ringbarked and managed for non-residential grazing purposes – a reflection that is completely in keeping with the area's relative isolation, prime economic utility as periodically utilised pasture, and the rugged, heavily timbered nature of much of the terrain. By the late 1950s, six of the blocks are shown as containing huts and some associated infrastructure, including the remains of Tantangara Homestead; they include B (most likely Hains Hut), F (Tantangara), G (including former conditional purchase holdings on the Murrumbidgee), J (possibly Traces Hut), L10 (possibly Wares Hut and Yards), and T11 (hut, stable, yards and horse paddock shown for former block E, also on Boggy Plain). Not surprisingly these tended to occur in association with some of the holding's higher quality grazing areas, at the edge of open grassy plains with good water and sometimes river frontage. In an interview with Klaus Hueneke, Herb Hain of Cooma briefly described his relationship with Fred Lampe and his eventual acquisition of a prime high country lease:

I became quite good friends with him (Lampe) many years after and I finished up getting Zinc Range, which was part of Gooandra, and it was the main paddock and the best part of their country in Gooandra. (*in Hueneke 2005: 141*).

While Herb says this was on Gooandra technically it's not correct; the concise Zinc Range is located directly to the north of Tantangara Homestead and the Hains were the last to hold title to Block B, on the Tantangara Run.

Table 10 Improvements listed in respect of Lease/Permissive Occupancy in the later phases of Tantangara Run occupation.

Lease/PO	Year	Improvements	Notes
B	1957	Private hut and fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3022
	1958	Private hut and fencing.	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2942
E	1933	Boundary fencing (Crown), £150 2s.	<i>Gov. Gaz. NSW</i> 28 July 1933 (115): 2854
	1957	Private fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3023
F	1935	Fencing and timber treatment (Crown), £145; private improvements not valued.	<i>Gov. Gaz. NSW</i> 26 July 1935 (136): 3139
	1938	Fencing and timber treatment (Crown), £162; private improvements not valued.	<i>Gov. Gaz. NSW</i> 22 July 1938 (109): 2918

Lease/PO	Year	Improvements	Notes
	1939	As above	<i>Gov. Gaz. NSW</i> 28 July 1939 (113): 3874
	1940	Fencing and timber treatment, (Crown), £155, private improvements not valued.	<i>Gov. Gaz. NSW</i> 26 July 1940 (103): 3160
	1944	About 76 chains netting fence, half value; private house, £25; shed, £5; stockyard, £5; sheepyards, £15; internal fences, £23; about 284 chains wire fences, half value, £31 11s. 9d.; about 280 chains netting fence, half value, £46 13s. 9d.; all Crown property.	<i>Gov. Gaz. NSW</i> 1 Sep 1944 (87): 1531
	1957	Part hut and fencing (Crown); part hut and fencing (private).	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3023
F5	1957	Crown fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3024
G	1957	Crown fencing; private hut and fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3024
	1958	Crown fencing; private hut and fencing.	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2942
G2	1957	Private fencing	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3024
G5	1934	Fencing (Crown), £113 6s. 3d.	<i>Gov. Gaz. NSW</i> 20 July 1934 (132): 2680
	1937	Boundary fencing (Crown), £100.	<i>Gov. Gaz. NSW</i> 23 July 1937 (105): 2984
	1940	Boundary fencing (Crown), £95	<i>Gov. Gaz. NSW</i> 26 July 1940 (103): 3160
	1957	Crown fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3024
H	1957	Private fencing	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3024
	1958	Private fencing	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2942
J	1933	Boundary and other fencing and ringbarking, £337 9s.	<i>Gov. Gaz. NSW</i> 28 July 1933 (115): 2855

Lease/PO	Year	Improvements	Notes
	1934	Fencing, timber treatment, yards and hut, £379 12s. (part Crown and former lessee).	<i>Gov. Gaz. NSW</i> 20 July 1934 (132): 2679
	1954	Hut, yards, horse paddock and fencing.	<i>Gov. Gaz. NSW</i> 10 Sep 1954 (145): 2757
	1957	Crown hut and fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3025
	1958	Crown hut and fencing.	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2942
L10	1957	Private hut and fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3025
M10	1944	About 275 chains netting fence, half value, £41 5s. 0d.; about 140 chains wire fence, half value, £12 5s. 0d.; about 160 chains netting fence, full value, £41 10s. 0d.; all Crown property.	<i>Gov. Gaz. NSW</i> 1 Sep 1944 (87): 1531
	1957	Crown fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3026
N1	1957	Crown fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3026
N10	1957	Private fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3026
	1958	Private fencing.	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2943
O10	1957	Private horse paddock.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3026
T10	1957	Crown and private fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3027
T11	1957	Private fencing, hut and stable.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3027
U10	1957	Private fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3028
	1958	Private fencing.	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2943
Y1	1933	Fencing and ringbarking, £104 2s. 6d., part Crown property and part property of former lessee.	<i>Gov. Gaz. NSW</i> 28 July 1933 (115): 2855

Lease/PO	Year	Improvements	Notes
	1957	Crown and private fencing.	<i>Gov. Gaz. NSW</i> 20 Sep 1957 (109): 3029
	1958	Crown and private fencing.	<i>Gov. Gaz. NSW</i> 19 Sep 1958 (94): 2943

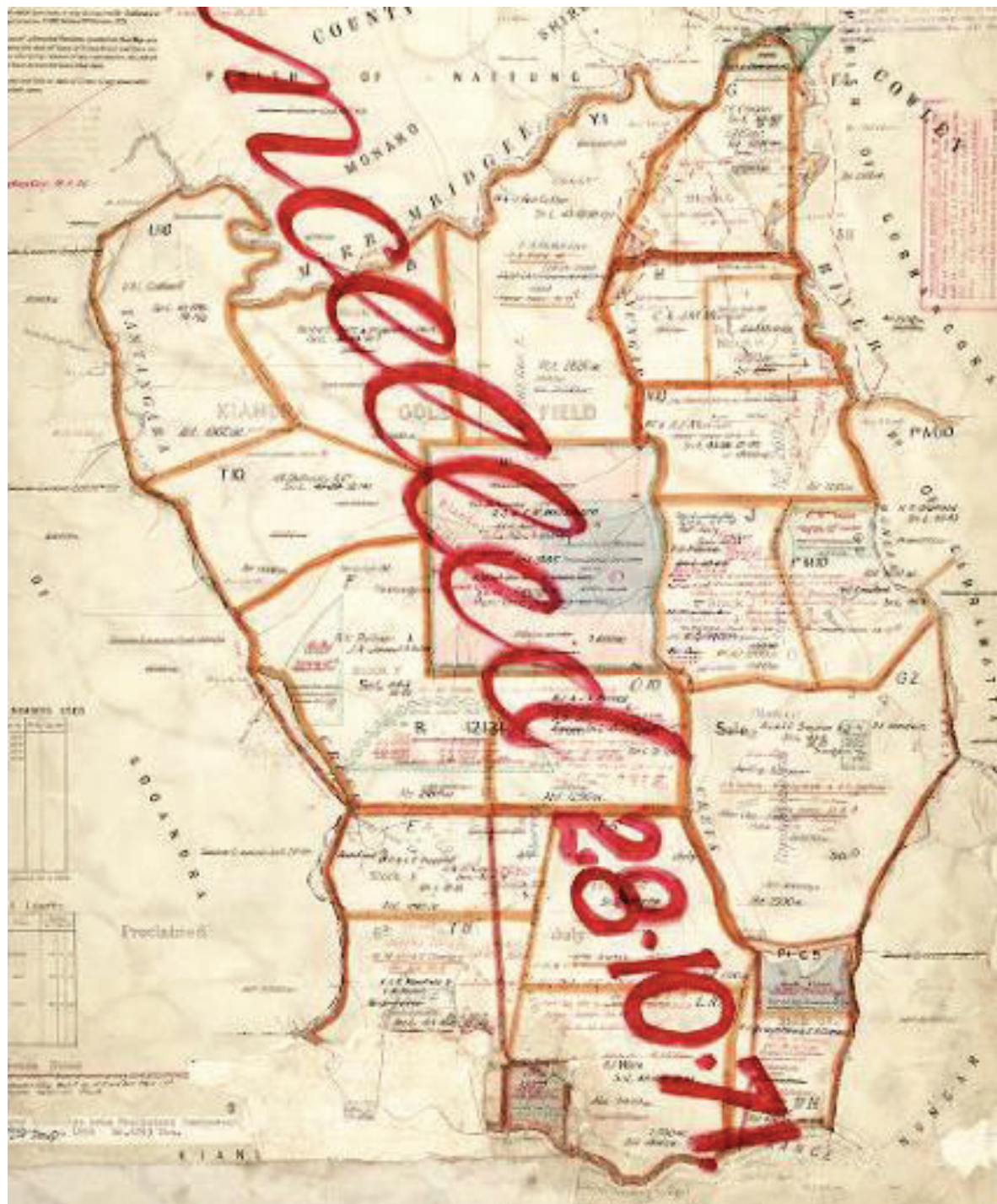


Figure 28 Post-1944 division of Tantangara into eighteen lease blocks (1930 Tantangara Parish map 4th Edition).

6.3 MINING

By 1836, independent and government commissioned scientists began to explore the Snowy Mountains. The first scientific explorer was John Lhotsky. Count Paul Edmund de Strzelecki was the next, and now most famous. He made an extensive exploration of the region, mainly on the western side of the Great Dividing Range. Although best known for his ascent of Mount Kosciuszko in February/March of 1840, his explorations were chiefly for the purpose of mineralogical research.

The geologist and Anglican clergyman the Reverend William B. Clarke, was commissioned in 1851 to make a geological survey of NSW '... with a special view to the indications of gold...' at which time he reported gold in the Snowy Mountains. In 1852, Clarke found gold in many of the streams draining the eastern and north-western margins of the Snowy Mountains (Clarke 1860: 213-4, Moye 1959:4-5).

Dan and Joseph Pollock were two brothers who ran stock at Gibson's Plain (Kiandra) in the summer and removed them to a station they owned in the Tumut district in the winter. Joseph Pollock stated in March 1860 that he had prospected among the ranges in the Kiandra locality and had found gold as early as 1854. In 1859, the brothers reported finding a large quantity of gold in Bullock Head Creek, a western tributary of the Eucumbene River. From that report, Kiandra was born in 1860 (Dowd n.d., Stegemann 1988: 1, Sydney Morning Herald 20 March 1860:4).

Following the initial reports of gold at Kiandra, large numbers of prospectors quickly moved to the area. As a result, while there was an abundance of gold in the country around Kiandra in February 1860, by the end of that year most had been extracted. 'Kiandra in 1859-60 was the scene of one of the most hectic short-lived gold rushes in the history of Australia' (Moye 1959: IX).

Other large mining operations were also undertaken concurrently with that of Kiandra at Nine Mile, Fifteen Mile, and Eight Mile Diggings and the Thredbo/Crackenback diggings. These too were all but abandoned by the early twentieth century.

Copper Mining - Lobs Hole

While it is gold that the Snowy Mountains are most famous in terms of mining endeavours, copper had also been identified in the area. Other histories of the copper mining at Lobs Hole specify that the first commercial exploitation of the ore occurred in 1874 (*cf.* Pearson 1979; Boot 2001). The reason for this is that one of the main authoritative records of the mine, 'The Copper-Mining Industry and the Distribution of Copper Ores in New South Wales' produced by J. E. Carne in 1908, provides this date. Carne deduced that mining began at this time because this was the first year that he could find records showing ore arriving from Lobs Hole to Port Waratah in

Newcastle for smelting. However, our research indicates that commercial mining started at a significantly earlier date, in about 1865.

The dates relating to the copper mining at Lobs Hole are somewhat confused in the early literature and recent syntheses (i.e. Pearson 1989; Boot 2001 & OnSite Cultural heritage Management 2015) and are not easy to disentangle. A number of early accounts (including Carne 1908) regarding the early copper mining at Lobs Hole were written after the event when operations were at their peak and the copper mining ventures had grown more noteworthy. A number of authors took word of mouth sources at face value when summarising the earlier history and because of this some inaccuracies and inconsistencies were inevitably recorded. The following research outlined below takes this into consideration.

The presence of the rich deposit of copper ore located at Lobs Hole was obvious to the passing observer. Outcropping on either bank and across the bed of the Yarrangobilly River, early travellers described it as being prominent, glowing radiantly in the landscape. While the date and identity of the first European to identify the exposed copper bed is not recorded, Clarke (1860) indicates that even as early as 1860 it had '*been long known to exist*'. In that year the Pollock brothers reported (Sydney Morning Herald 13 June 1860) the existence of an extensive copper deposit, not far from Kiandra (presumably at Lobs Hole), saying that there were 'tons upon tons' of it.

The locality known as Lobs Hole originally extended from the junction of the Tumut and Yarrangobilly Rivers (now under Talbingo Reservoir), upstream in a south-easterly direction along the Yarrangobilly valley for a distance of some six kilometres to beyond the point where it meets Wallaces Creek. Although the majority of gainful copper mining leases are located towards the south-eastern end of Lobs Hole, the entire locale was prospected and a total of 53 Mineral Leases applied for within the Parish of Selwyn (52 for mining copper). While many parties had great ambitions to make their fortune mining for copper at Lobs Hole, the historical record reveals that many, if not most, failed.

Early reports suggest that the initial copper mining took place junction of the Tumut and Yarrangobilly Rivers and the parish maps shows ML44, a copper mining lease comprised of 40ac, located at this point. At this time, we haven't pursued the early copper mining history of the junction of the two rivers, but it is likely that additional research would provide further information.

Some of the first documented mentions of mining at Lobs Hole come from newspaper articles about prospecting along the Tumut River. One such reference comes from the Goulburn Herald (28 February 1852), where an article describes a prospecting tour that had aimed to get to Lobs Hole but ended up at Mitta Mitta following word

that the prospecting party at Lobs Hole had ‘met with no success’. Copper was also discovered accidentally at Adaminaby around 1860, during the sinking of a well on one of the pastoral stations. That discovery led to the establishment of the Kyole Copper Mine (Neal 1988).

A newspaper report in the Sydney Morning Herald (7 December 1860) details the following description of the copper lode at Lobs Hole:

Here lies riches whose extent remain – and, from the formation of the country probably ever will remain – unexplored. The sun strikes upon the lode, the ground glows with all the hues of the rainbow, and copper of superior richness stands revealed – the lead cropping out for many yards on the bank, and running across the bed of the creek. A small hole has been dug, specimens obtained and declared by the mint authorities to average nearly 40 per cent of pure copper. Pity ‘tis that from the inaccessibility of this vale such deposits must remain unproductive; and pity ‘tis, ‘tis so – for until the iron horse is superseded by the aerial machine, they must remain the property of mother earth.

As noted previously, histories of copper mining at Lobs Hole generally indicate that the first commercial mining of the ore occurred in about 1874, however, it was considerably earlier than this. In 1860, Messrs A. Biermen, F. A. Cooper and Chas Miesegaes applied for a lease over 32 portions of 80 acres, totalling 2,560 acres, for the purpose of mining copper at Lobs Hole. They were subsequently granted this mineral lease pending payment of the first year of rent (New South Wales Government Gazette Friday 29 November 1861). However, there is no indication that this lease was actually taken up. Instead, the first Europeans accredited with having arrived at Lobs Hole and to have begun exploiting copper commercially were a group of Cornish miners in about 1865. This party was comprised of Thomas Green, a Mr Cook and some other unnamed members. They commenced mining by sampling ore from a narrow seam. The Sydney Mail reporting on 2 October 1869 that:

the Lob's Hole Copper Mine is again at work. The holders think of sending the ore to Newcastle. It can be delivered there from the hole for about £12 per ton, and as in Newcastle the ore from this mine is worth £27 per ton they anticipate making a first-rate thing of it.

It appears that this plan was followed through as it was subsequently reported that they parcelled ore up and sent it on horseback the 120 miles to Twofold Bay, where it was shipped to the E. and A. Smelting Company in Newcastle (Sydney Morning Herald - 10 November 1908).

It seems that thereafter in 1870, Green negotiated with other parties in order to raise finances to keep the mine running. This continued operation of the mine contradicts a version of events later promoted by subsequent owner Julius Forsstrom. Forsstrom apparently indicated that the mine ceased being worked at this time and remained closed until he and his party reopened it in about 1889. However, it is apparent that there was ongoing interest in exploiting the mine by a

succession of enterprises. Some clarification of the matter can be found in the Sydney Morning Herald article of 13 November 1908, which reported:

Writing on the subject of the Lobb's Hole copper mine, Mr. J. Vercoe, of Marrickville, states it is incorrect to say that the lode was not worked between the time it was abandoned by the discoverers - a party of Cornishmen - and the time it was taken up by Forsstrom and party. This statement was made in the "Herald" article on the authority of Mr Julius Forsstrom. Mr. Vercoe writes: - "In 1870 the late Capt George Vercoe was despatched to report on the prospects of some mineral selections acquired by a syndicate comprised of the following gentlemen:- Sir Saul Samuel, Dr. Garran, S. De Lissa, B. De Lissa, and others whose names I have forgotten. After some little negotiations, there was an amalgamation of interests, and then work commenced at the mine. Some 20 tons of ore were despatched by teams to Merimbula. The ore assayed 27 per cent. The carriage was £10 1 per ton. After sometime the lode formation at 60ft widened to about 2ft, and the water being heavy another shaft was sunk higher up, but the price of copper being low, the work was practically abandoned in 1871. There are three distinct lodes on the property."

Thomas Green was still residing at Lobs Hole and mining copper with a handful of other men when a travelling reporter passed through in 1872. The correspondent described a comfortable house and small farm that Green had set up, as well as the abundance of copper visible, dipping into the Yarrangobilly River. At the time, a lode was being mined that was five feet wide containing a vein of solid copper ore which was between twelve to twenty-four inches thick. Concurring with the above account published later in the Herald, the Australian Town and Country Journal correspondent reported that some twenty tons of copper ore had been extracted from the mine and shipped to Newcastle and that it had a very high yield of between 25 to 28 percent of copper (2 March 1872: 18). Nevertheless, the impediment imposed by the remoteness of the location, the difficulty of access and the corresponding high costs of shipping the extracted ore significantly challenged the mine's profitability. In addition, great problems managing the influx of water into the diggings only added to the challenges. As a result, the party was only able to work the mine for brief periods (Australian Town and Country Journal 2 March 1872: 18).

The Yarrangobilly Copper Mining Company came into existence at about this time (1872), with the abovementioned Capt. George Vercoe overseeing the mine and Benjamin DeLissa managing the company. Around the end of 1872 and the beginning of 1873, judging by the number of advertisements placed in numerous newspapers seeking workers, it appears that at its inception, the company had high expectations for the mine. This included two advertisements placed in many local papers including two in the same edition of the Gundagai Times and Tumut, Adelong and Murrumbidgee District Advertiser (21 December 1872: 3), with one somewhat ambitiously seeking to employ 50 Cornish copper miners.

In 1873, the New South Wales Government Gazette (22 August: 2301) published an application to officially register 'The Yarrangobilly Copper Mining Company

(Limited)'. Listing the place of operations as 'Lobb's Hole, near Kiandra, in the Colony of New South Wales', it noted the manager of the company as being Benjamin DeLissa. The nominal capital of the Company was given as seventy-two thousand pounds in shares, with the amount already paid up being sixty-one thousand three hundred and twenty-five pounds. Of interest, Thomas Green of Lobb's Hotel, Kiandra, New South Wales, was indicated to be one of the six paid up shareholders, having 2,000 proprietary shares valued at £2,000, with nine listed contributing investors. Another shareholder of note was Sir Saul Samuel, colonial merchant, pastoralist, member of parliament and NSW state treasurer from 1859 to 1870, who held 8,000 shares in the company. In 1888 the Gundagai Times and Tumut, Adelong and Murrumbidgee District Advertiser (15 May) reported that Messrs. J. Clayton and party had pegged out a lease of about 120 acres on a copper lode at Lobb's Hole.

Exhibiting interest in copper mining at Lobs Hole at the same time as The Yarrangobilly Copper Mining Company was another consortium, calling themselves the 'Argus Copper Mining Company, Yarrangobilly River, Kiandra'. The Evening News of 12 October 1872 published the company's prospectus seeking investment through the sale of 80 shares at £50 each. Outlining its aim of working 200 acres of rich copper land on the Yarrangobilly River, the enthusiastic portrayal described copper lodes with an average thickness of eight feet, outcropping six feet above the ground and assaying at 40 to 50 percent pure copper. The prospectus excitedly stated that 'men leave today to commence work, and prepare the ore for the market', and promised speedy remunerative returns for investors. The 'Argus Copper Mining Company, Yarrangobilly River, Kiandra' however, appears to have ceased being a functioning entity soon after this time.

This efflorescence of interest in mining and investment at Lobs Hole was typical of the optimistic and ambitious sentiment which held over much of the country in the 1870s and 1880s. Being firmly based on agriculture and pastoralism, the Australian economy had originally been staid and conservative. However, it underwent significant upheavals during the gold rushes which lasted for about a decade and a half during the mid-1800s. The value of exports from New South Wales and Victoria rose by a factor of six, and exports of gold exceeded wool for 18 consecutive years. In turn, wages increased dramatically (Battellino 2010).

While the gold boom had largely waned by the mid-1860s, its effects nevertheless continued to exert a positive ongoing impact on economic activity, with confidence remaining high. The requirements of servicing the mining industry, as well as an increased flow of immigration, significantly boosted demand for goods and services (Battellino 2010; Welsh 2004).

Thereafter a second lesser boom ensued, driven by the discovery and development of new gold and metal mines across the country, particularly in Western Australia,

Queensland and western New South Wales. This was partly the natural consequence of the spread of the population to more remote areas but was combined with an interest and expertise in prospecting which had been motivated by gold, then soon led to discoveries of other metals. However, while much of the gold mining was alluvial, the working of other lodes often necessitated deep shafts and machinery and treatment plants, and this required capital. In consequence, the individual miner or syndicate was soon replaced by companies, often employing dozens or even hundreds of men (Australian Bureau of Statistics 2000).

This transformation both required and drove developments in the capital market. Buoyed by ongoing mineral finds and with the economy still underpinned by the reliable exporting of wool, there seemed to be no limits to the potential wealth of Australia. This gave rise to an investment boom in Australia in the late 1870s and 1880s (Battellino 2010), as evidenced by newspapers of the day, with page after page filled with prospecting, assaying and mining reports compiled for the benefit of potential investors.

On the ground this translated as a prospecting frenzy. A small insight can be gained from The Gundagai Times and Tumut, Adelong and Murrumbidgee District Advertiser's article of Tuesday 15 May 1888:

The main topic of talk in Tumut is of silver lodes. Almost every third man one meets has a sample of some mineral about him which he offers for inspection and which he fondly hopes may turn out to be the genuine article. Prospecting is now the order of the day, and this is well as the rich hidden wealth of the district which has laid dormant so long, is likely to be unearthed.

The confidence was contagious and in turn ample capital to fund exploration and mining activities flowed from London. Additionally, the development of the 'no-liability' company contributed to make it much easier to access this capital. The London Banker's Magazine, 'torn between awe and alarm', noted that the Australasian colonial debts were the highest per capita in the world, and in turn this influx of reserves led to Australians also enjoying the highest per capita incomes in the world during the late 19th century (Welsh 2004).

However, while there was an upsurge in investors hoping for rich returns, speculations were often proving to be unfruitful, with invested monies frequently failing to pay dividends. By the end of the 1880s, overseas investors became more concerned with the difference between expected and actual returns on Australian investment. The Barings Crisis of 1890, although caused mainly by excessive risk-taking on poor investments in Argentina, nevertheless led to a reassessment of the exposure of investors to regions of declining return and, consequently, British investors began to retreat from further funding the Australian market. This withdrawal of financing was felt at Lobs Hole, when in 1888, the price of copper plummeted from £99 a ton to £35 (Australian Bureau of Statistics 2000; Welsh 2004).

As noted above, Carne (1908) deduced that mining began at Lobs Hole in about 1874 because this was the first year that records showed ore arriving from Lobs Hole to Port Waratah in Newcastle. In total, 16 tons 16 cwt were recorded as being smelted from Lobs Hole that year, yielding 26½ percent of copper. However, Carne (1908) did not record the name of mine owner. There is however some reasonable possibility that Thomas Green and colleagues could well have still been mining at that time (Sydney Morning Herald – 10 November 1908).

A party made up of Messrs Reeckmann and Neilson, and quite possibly Wilson and Wesselman also, are reported in 1891 (Sydney Mail and New South Wales Advertiser Saturday 14 March 1891) to have worked on an existing copper mine at Lobs Hole, drawing the old timber slabs and substituting new ones in an 80ft shaft, as well as making safe the previously used drives. The mine is thought to have been located on M.L. 30 (Boot 2001). The newspaper indicates that at the time the men were awaiting delivery of pumping machinery and stores. The following year “Wesselman and party” were granted aid in order to sink a shaft to a depth of 180 feet. Having reached the 80 foot level they were forced to abandon their efforts, and the mine, probably due to problems related to flooding of the mine. The equipment which they had employed, which is described as a ‘pumping plant’ was thereafter relocated to an unrelated mining site at Tumbarumba (Carne 1908).

The Sydney Morning Herald (10 November 1908) reported that copper mining at Lobs Hole then ceased for some time. Boot (2001) indicates that mining remained dormant until the late 1880s when Messrs Julius Forsstrom, Adolf Reeckmann and Martin Amundsen reopened M.L. 30. They combated flooding of the mine by using an overshot water wheel pump that was driven by means of water fed from a race tapped into the Yarrangobilly River. By this method the mine was kept dry and they were able to excavate to a depth of 80 feet. The first lot of ore extracted was smelted to 52 percent matte before being sent to Swansea in Wales. Thereafter, a second consignment of ore was sent to Mr. Lewis Lloyd's copper works at Lithgow. However, the cost of transportation by pack horses out of Lobs Hole to the Kiandra tableland and thereafter to the Cooma railway station was onerous (Sydney Mail and New South Wales Advertiser Saturday 17 January 1891). In approximately 1893 when the price of copper tumbled to £38, Forsstrom and Reeckmann abandoned the field and headed west for a time to work in the gold mines of Western Australia (Sydney Mail and New South Wales Advertiser Saturday 3 May 1902; Sydney Morning Herald - 10 November 1908).

By the late 1890s, mining intensity at Lobs Hole increased significantly, no doubt assisted greatly by the rise of the price of copper from £38 to £51 in 1897. Recouping their finances in the Western Australian gold mines, Forsstrom and Reeckmann returned to Lobs Hole and again took up their mine in c. 1897/1898 (HO&DUAP

1996; Boot 2001: 2; Carne 1908; Sydney Mail and New South Wales Advertiser Saturday 3 May 1902; Sydney Morning Herald - 10 November 1908).

Forsstrom and Reeckmann sank a shaft on the riverbank from 80ft to 120ft, striking a copper lode that showed 4ft of solid, clean, yellow ore. Working in 'a most primitive manner' with just six men, they extracted £40,000 worth of copper (Sydney Morning Herald Tuesday 10 November 1908, page 5). This success allowed them to form a company in 1900, the Lobbs Hole Copper Mine, with Forsstrom and Reeckmann as principals. They paid £800 in dividends one year, notwithstanding that horse-packing the ore to Gundagai or Cooma cost £4 a ton (Sydney Morning Herald - 10 November 1908). In that same year they brought mining equipment in from New Chum Hill at Kiandra and constructed a two kilometre water race to drive a Pelton wheel that not only powered the water pumps, but also haulage in and out of the mine.

The installation of the Pelton wheel represented a significant improvement in technology. The race carried a flow of water 7 feet wide and 1 foot deep, providing 50 feet of pressure. At its outlet, the race connected to heavy wrought-iron pipes, 33 inches in diameter, which directed a powerful jet of water onto the wheel. The power thus harnessed, drove a 30 horse-power turbine situated near to the shaft and provided the capacity to drive numerous mechanical devices. Indeed Carne (1908) observed that 'the advantage of the site is permanent and cheap motive power from the continuously flowing Yarrangobilly River, for all mining purposes, including milling, lighting, &c., which offsets the disadvantages' of its remoteness for transport (Pearson 1979; Dept of Mines Annual Report 1901; Sydney Morning Herald - 10 April 1900).

Forsstrom and Reeckmann's discovery of a reliable lode of copper and their ability to commercially exploit its quality reserves of ore encouraged other parties to take up mining in the valley. The Alpine Copper-Mining Company (later called Sonoma) was registered in 1900 and excavated to a depth of 100 ft in 10 weeks (Government Gazette of the State of New South Wales 20 August 1901; Tumut and Adelong Times 15 November 1901). It was established on the northern bank of the river, excavating along the Kerry and Forrester's Lode, subsequently called the Alpine Lode. This was located opposite the Lobbs Hole Copper Mine on M.L.'s 19 and 32 (Boot 2001; On Site Cultural Heritage Management 2015). Two other groups also took up leases about this time - in 1901 R. Joyce set up a 20 acre lease to the north-east of Lobs Hole; and the Coronation Copper Mining Syndicate which was established on M.L. 18 in 1903, to the west of the Lobs Hole Central Mine (Boot 2001; Carne 1908; On Site Cultural Heritage Management 2015).

The year 1901 is indicated to be the beginning of the boom period at Lobs Hole, but even so, the following year the price of copper once more slumped and no ore was

taken out of the valley. During the downturn in price, the various mining companies focused principally on mine development and amassing copper reserves. The price of copper rebounded in 1903, but in 1905 issues with flooding seriously hampered works in the valley causing production to fall by two thirds. In 1906, the Lobs Hole Central Mine was flooded and unwatered, while the Lobbs Hole Copper Mine also had its shafts flooded for a period lasting 2 months. Forsstrom and Reeckmann were required to install a new and more powerful pump with a pumping capacity of 7,000 gallons per hour so as to overcome the inflow (Pearson 1979; Boot 2001: 2).

In 1907, the Lobs Hole Copper Mining Company (No Liability) was floated by Forsstrom and Reeckmann so they could raise the capital to secure M.L.'s 1, 30 and 31. It was at this time that accommodation for 14 miners was constructed and a new track was also established leading out to Yarrangobilly which enabled bullock teams to haul the ore out of the valley. Prior to this time, all ore had to be transported out of the valley on packhorses until they reached the top of the ravine where the load could be transferred to carts (Dept of Mines Annual Report 1901; Boot 2001; Pearson 1979).

The cost and difficulty of transporting the raw ore out of the valley to smelter impacted considerably on profits and for many years it was presumed that a smelter would be built at Lobs Hole to concentrate the mineral before it was transported out. However, moves to this end did not start until 1907 when the Lobbs Hole Copper Mine N.L. advertised in the Adelong and Tumut Times (29 November 1907) for brickmakers to tender for the supply of 60,000 bricks. It was thereafter reported that a contract had been let for the manufacture of bricks for a reverberatory furnace and subsequently that the first 35,000 bricks had been 'burnt' and appeared to be of excellent quality. The bricks were fabricated on site, using local material (The Department of Mineral Resources -16 January 1908; 8 April 1908; Sydney Morning Herald 13 May 1908).

Thereafter, while it was reported in May 1908 that the reverberatory furnace was completed and soon to commence service, it was not until the following year that 'the Lobb's Hole Copper Mining Company has put the first fire in their new reverberatory furnace, and expect to be ready for regular smelting early next week' (Daily Telegraph 14 Jan 1909). The purpose of the furnace was to roast the mined ore in order to enrich and concentrate it for later smelting (Boot 2001; Pearson 1979). In order to transport the ore from the mine to the reverberatory furnace an overhead tramway was erected leading from the shaft through a small rock-cutting, trucking the material to the roasting beds (Daily Telegraph 30 June 1908).

In 1907, the Alpine/Sonoma mine was purchased by rival investors and renamed the Lobbs Hole Central Mine (Higgins and Scott 1995). During 1908 and 1909, they extended the length of its shaft to 200 feet and operated reasonably profitably, before

the mine lease was taken over by Forsstrom in 1910. From about 1910, copper mining in the valley started to wind down as it became increasingly difficult to turn a profit, chiefly due to the repeated flooding of mines and the fluctuating price of copper. Lobbs Hole Central Mine was abandoned in 1912 because of falling copper prices, and in 1913, Forsstrom purchased control of the Lobbs Hole Copper Mining Company (Pearson 1979).

From this time, mining slowed significantly. Copper production at Lobs Hole had peaked between 1890 and 1902. After this, production fell due to the combination of problems with gas in the mines, shaft flooding, market fluctuations and prohibitive transport costs. Many of the miners left the valley in 1914 to serve in the war. Requiring workers, Forsstrom brought in striking coal miners from Newcastle. However, thinking that the Finnish born Forsstrom was a German, they sabotaged the mine by flooding it. The mine was pumped out in 1915 but when it flooded again the following year mining ceased (Boot 2001; Pearson 1979; Carne 1908; NSW NPWS 2012).

The copper mines were abandoned in 1917, after which the township of Ravine also fell into decline. The final phase of mining was Forsstrom's attempt to treat the tailings dumps for copper, after which he moved his mining interests to Blue Creek (Pearson 1979). Forsstrom took up gold mining leases at Kiandra in the years leading up to 1920, but little seems to have come from this (Government Gazette of the State of New South Wales 13 September 1918). He eventually headed to New Guinea to prospect for gold, but died there in 1931, apparently from after-effects of malaria (Tumut and Adelong Times (16 June 1931).

Gold Mining: Kiandra and Surrounds

By the mid 1830s, Europeans had begun regular summer grazing on the high country plains where present day Kiandra is situated. Prior to 1851 gold had been discovered in numerous regions within Australia, including John Lhotsky's discovery in the Monaro district in 1834. However, Major Sir George Gipps, Governor of the colony of New South Wales, actively sought to suppress such news for fear that it would greatly disrupt the workforce and in turn have severe and deleterious effects on the economy and society generally, especially given Australia was still demographically a convict colony (Home 1990).

With the advent of the Californian goldrush in 1848 a significant number of people began leaving Australia and setting sail for California to seek their fortune (Examiner 15 February 1934: 6). Suddenly the New South Wales colonial government was faced with a need to stem the exodus to stabilise an economy already in recession. In an attempt to halt the dissipation of the workforce the government decided to alter its earlier position and to actively encourage the search for gold. In 1849, approval from the Colonial Office in England was sought to allow

the exploitation of the mineral resources of New South Wales and a reward offered for the discovery of a payable goldfield. Thereafter, in 1851, Edward Hargraves initiated the discovery of gold at Ophir near Orange in New South Wales, which started Australian's first gold rush. The government later rewarded Hargraves the sum of £10,000 (Nairn *et al.* 1979).

Following this, more discoveries of goldfields were made in New South Wales but Victoria, proclaimed as a separate colony in 1851, swiftly became the significant centre of gold production with the discovery of numerous highly productive goldfields in that year. As a result, Victoria's population boomed from 76,000 in 1851 to 540,000 in 1861, and the country's from 405,000 in 1850 to more than 1,000,000 in 1858 (Moye 1959).

By the end of the 1850s much of the easily won shallow alluvial gold in the New South Wales goldfields had been mined. Because of this the goldfields were quickly growing less productive, especially when compared with those of Victoria, and the economy once more started to lag. Having witnessed the stimulation that significant gold finds could give to the economy, the New South Wales Legislative Assembly voted that a new reward, this time for the sum of £3000, should be established for the discovery of a new payable goldfield (Tybussek 2015).

Adding to this impetus to search for new goldfields was the influence of the 'geologist of eminence' the Rev. W.B. Clarke (Sydney Morning Herald 13 June 1860: 7). Clarke was a highly regarded geologist in the colony, having made many important geological observations and discoveries since arriving in 1839. From 1847, Clarke became active in drawing public attention to the geological potential for gold in the country and pressed for an official survey of New South Wales. From late 1851 to early 1852 he conducted an exploration of the southern goldfields, heading to the recently discovered Braidwood-Araluen goldfields before then working his way to the Monaro and Southern Alps. Clarke found gold in various places, some within twenty or thirty miles of Kiandra, but he did not proceed further because 'the climate was so inhospitable'. He nevertheless predicted the presence of gold in the district, saying that 'gold actually exists in ... all the creeks and river basins' in the area (Moye 1959). He based this augury on his personal theory, which today seems strikingly errant, that gold would be found on the edges of north-south trending mountain ranges (McQueen 2009; Empire 13 February 1860: 5).

It is not surprising that with so much focus in the colonies on finding new fields of gold, plus a reward on offer, that gold was at the forefront of much of the population's considerations, with a number of people actively engaged in prospecting. This also included graziers spelling their stock on the high country who took the opportunity to dabble in the waterways for gold. Indeed, it was reported in the newspaper that many of the inhabitants of the Snowy regions had:

... systematically each year, while their crops were growing, or after harvest or sheep-shearing, worked or prospected particular spots ... ever since 1851, that some of the neighbouring farmers and small stock-owners depend somewhat on their luck at these private diggings for a yearly augmentation to their means. In addition to these local periodical workers, a few parties of regular diggers of the more enterprising sort - those who prefer remote, quiet, and moderately paying diggings ... have prospected and partly worked the southern part of the Maneero, where the many beds of the Snowy River rise...' (The Melbourne Age, 16 February 1860).

The popular understanding is that it was David and James Pollock who discovered a payable goldfield at Bullock Head Creek in early 1859. The find is said to have happened while the Pollock brothers were grazing their sheep on Gibson's Plains, in an area to the north of the area where the Kiandra township would subsequently be sited. They reported their find in Tumbarumba in June as they returned to the Murray where they wintered their stock (Moye 1959). However, despite the newspapers of the day initially assuredly asserting 'The discoverer of the diggings is a Mr Pollock...' (Empire 13 February 1860, p. 5) this version of events was soon after disputed, being challenged by two other parties, James Smirl (a nephew of the Pollocks), and Gillon, Hayes and Grice from the Monaro (Sydney Morning Herald 27 March 1860, p. 4). Gillon, Grice and Haynes claimed that on hearing of the report of the gold find Queanbeyan storekeeper J. J. Wright sent them to prospect in the locality in order to corroborate the claim, at which time they found payable gold in Pollock's Gully, in an area south of the original discovery, and that it was this that prompted the rush to Kiandra (Tybussek 2015).

At a public meeting at Kiandra in March 1860 each party outlined their claim. Thereafter the Sydney Morning Herald reported 'Mr. James Pollock is about applying to the Government for the gold reward in respect to the discovery of the Snowy River Diggings. He feels confident that he will be able to produce conclusive proof that he was the first individual who found gold here, and made the discovery public' (Sydney Morning Herald 10 April 1860: 5). However, ultimately it seems no party could irrefutably stake their claim of discovery, and a reward was never paid. Even some one hundred years after the event, recognition for the discovery of the goldfield was being sought. This account appeared in the Cooma-Monaro Express in 1956:

Sir, I wish to make a correction of a statement made by Mr. Arthur Goodman, which appeared in the Cooma-Monaro Express on February 10 as to who found the first gold at Kiandra. I would say Mr. Goodman has been very much misinformed as he states Kiandra was found by a stockman named Pollock in the late 50s. I claim to be able to give the true facts as when gold was first found and the men who found it were my grandfather, the late William Russell Senior, Berrigan, Black and McClean. The party used to go prospecting at times in the summer months and on this occasion was working on what is known as Pollock's Gully on the south side of where Kiandra stood.

The gully came by the name owing to the Pollock brothers having their sheep camped

on the head of the gully. Pollock's used to bring sheep into the hills in the summer months and very often call at my grandfather's place at Denison, where he settles in 1848.

In the autumn of 1859 Robert Pollock called at Denison inquiring for my grandfather, as he said he wanted to see him very particularly. Grandmother said, 'If you want to see him particularly, I will sent John out with you, as he knows where they are working. On arrival at the claim, my father John heard the conversation which took place between Pollock and the party as that they may have found a payable goldfield, and if they would allow him to take some of the gold, he would find out. After some discussion between the party, they allowed him to take some of the gold, and in less than a week's time there were 500 men on the field. I believe Pollock put in for the reward, also a couple of others, but I understand no reward was paid...

C.M. Russel Wattle Dale, Adaminaby

Whatever the actualities, news of the recently discovered goldfield swiftly spread and gave rise to what would become a spectacularly short-lived boom and bust goldrush (Gant-Thompson 2008). The first newspaper report of the find was published in the Sydney Morning Herald on the 26th November 1859 somewhat imprecisely telling of 'gold being found on the Snowy Plains, situated upon the Australian Alps, and that many are doing well at that place'. Thereafter, by early January 1860, prospectors totalling some 30 – 40 persons had begun mining the alluvial gold with some success 'perhaps earning on average an ounce a day'. However, it was not until early in 1860 that follow up coverage appeared in the newspapers.

Information reached Sydney on the 20th of last month that a new Gold-field had been discovered in the Maneroo district, about fifteen miles from Cooma. The account stated that the new diggings promised to be of a very productive character, that the sinking was shallow and the ground easily worked, and that a considerable number of people had found their way to the spot, most of whom were making an ounce a day per man.... The Government Gazette of the 11th instant proclaims the place a Gold-field within the meaning of the Act, and gives it the name of Kiandra, which, however, is not likely to be generally adopted' (Empire 13 February 1860 p.5).

The Empire (13 February 1860: 5) article went on to say how the goldfield had been taken up by hundreds of prospectors, most of whom had moved in from the nearby goldfields of Braidwood, Tumut, Adelong and the Ovens (located near present day Beechworth in Victoria), where the quantity of gold being won was dwindling.

'We hear that the first party at work on the field have obtained 4 lbs weight; and that two men, one of whom is named Russell, obtained in part of two days no less than 4 ozs. The sinking at present from 3 to 6 feet; the diggers at the last accounts were sluicing in the river and tributary creeks, and no shafts had yet been sunk. ...There are about six hundred diggers already on the spot, and most of them are said to be doing remarkably well; two, three, and even four ounces per man per day are stated to

be not unfrequently realised; and in many instances even a much larger amount. The sinking is shallow; the gold nuggetty and very bright’.

...‘We have been favoured with the following extract from a letter received in Goulburn from a Tumut storekeeper, dated January 29, from which it will be seen that a complete exodus is taking place from Adelong and Tumut to Gibson's Plain. He says, "I am starting tomorrow morning for the new diggings; there are not a hundred men left on the Reef. The farmers and townspeople are all going this next week. About 50 of us are going tomorrow. N-- started off in a spring cart a couple of days ago, to make a dray road, he says he will cut his way, but I think he will leave the cart on the road. Reef and town will be deserted next week’.

...The new diggings will undoubtedly be the richest ever discovered’.

With such emphatic coverage in the newspapers, let alone arrantly exaggerated claims like ‘People are averaging thirty ounces a day per man’ (Sydney Morning Herald, 3 March 1860, p.6) that followed, it is no surprise that a goldrush quickly ensued. By the middle of January 300-400 persons were working the goldfields of Kiandra, and the rush accelerated from there. By the 25th of the month around 700-800 hopeful miners had arrived, and by the end of the month that number had swollen to between 900-1000 (Tybussek 2015). However, although the area seemed rich with gold in February 1860, by the year’s end there was very little of it left. Official gold production figures show that the great hope of Kiandra resolving the economic anguish of the colony in 1860 had very swiftly dissipated. By 1861 the amount of gold being won had fallen drastically, and by 1862 it had all but disappeared. In 1860 official gold production was a quite significant 67,687 ounces. However, the following year, 1861, the figure dropped considerably to 16,565, and in 1862 fell even further to 7,385 ounces (Smith 1998).

Even in the first few months, as many new arrivals at the goldfield quickly discovered, the paying ground was located in a very limited area along the stream, and these claims had immediately been staked out by the first arrivals.

To obtain a claim in any portion of the present river diggings is, of course, out of the question, the whole of the paying ground (and it only extends for about a mile and a quarter) being taken up by those who were so fortunate as to be first in the field. Hence, new comers have no option but to go prospecting about in search of new diggings (Sydney Morning Herald, 20 March 1860: 5).

During the early stages, the mining works at Kiandra consisted of sluicing in the Eucumbene and its tributary creeks, with the digging being between three to six feet deep on the banks, and two or three feet deep in the riverbed itself. One method of working the riverbed entailed using comparatively minor diversionary races to lead away the water flow from the natural course of the river while the shallow bed was excavated out. While the principal early mining commenced by winning the more

abundant gold situated in the riverbed, by the end of January the fringes of the streams were also being exploited (Tybussek 2015).

Unsurprisingly, as more miners arrived on the goldfield and sought to work the best paying ground, disputes invariably broke out over claims. Sydney Morning Herald (28 February 1860) observing that: ‘in a spirit of acquisitiveness easily pardonable under such circumstances, they had marked out claims for themselves in utter disregard of how many feet constitute a yard’. At that time Assistant Commissioner Lynch, serving under the direction of Gold Commissioner Cloete, was charged with overseeing the southern goldfields. At the beginning of February Commissioner Cloete instructed Lynch to assemble the available police from Adelong and Tumbarumba and to make their way to Kiandra in order to assess the situation and bring order to the diggings. The Sydney Morning Herald (28 February 1860) reported that ‘the arrival of Commissioner Lynch, from Adelong, with a force of troopers, was a source of considerable pleasure to many. Without any hesitation he proclaimed his intention of measuring out claims from the centre of the bed of the river, allotting to each man thirty square feet...’. This pronouncement, however, that would remove significant areas of the rich riverbed from the established miners and reallocate it to the newer arrivals outraged the older hands, who immediately raised vigorous protestations with Assistant Commissioner Lynch, decrying that his proposed system was unfair and unworkable. In response, Lynch held an onsite meeting, where the discussion was ‘decidedly more energetic than polite’, and before the day was out he had rescinded his earlier decision. The Sydney Morning Herald (28 February 1860) quoting his address to the assembled crowd with Lynch saying:

Owing to the physical formation of the river. I find that my first resolution of dividing its bed cannot be carried out, since I should require a troop of dragoons to keep the peace in some portions of it. As my wish is not to govern you by dragoons or mounted troopers, but by reason and common sense, I revoke my first decision, leaving the entire bed of the river to its present occupants, and granting the immediate banks to those whose permits can now be altered.

Thus the *status quo* that prevailed prior to his arrival was swiftly returned, and the more recent miners to at the goldfield were once again pushed to the periphery.

Thereafter Assistant Gold Commissioner Lynch reported to Commissioner Cloete on 5th February, by which time there were some 1500 miners on the field scattered along the Eucumbene River. On that same day Gold Commissioner Cloete wrote to the Secretary for Lands recommending that Kiandra held sufficient prospects to be ratified as a goldfield. This advice was thereafter accepted by Governor General William Denison who on 10th February 1861 then formally announced the Kiandra Gold Field. One of the first responses of the Government was to establishment of a gold escort to safely convey the gold from the diggings, initially to Queanbeyan.

Thereafter, with increased amounts of gold being won through March and early April, the government chose to increase the frequency of the gold escort from once every two weeks to one escort per weekly. Also, seeing the success of the goldfield and anticipating it to long continue, the government chose to further invest in infrastructure and establishing a court of petty sessions and post office (Empire 11 February 1860: 6; Tybussek 2015).

Assistant Gold Commissioner Lynch described early on how miners were unable to secure supplies of equipment, or food, especially tea, sugar or flour - which in consequence meant bread. Mutton and beef were obtainable at a reasonable price, but firewood which was needed to combat the cold had to be carted for more than a mile and was relatively expensive, selling for between £3 and £4 a load (Sydney Morning Herald 28 February 1860: 3).

The mining techniques that were used at Kiandra had been recently developed and honed in the California goldrush and imported back to this country by returning miners such as Edward Hargraves, and miners who had moved on from those fields to try their luck in Australia (Carrington 1961). These miners employed a variety of tools and equipment to extract the gold. The basic items were picks, shovels, mattocks, crowbars, tin pans, buckets and wheelbarrows. Sluicing devices such as gold washing cradles or the more elaborate long tom were also used. With these relatively simple tools miners could move and extract the alluvial material and wash the dirt to salvage the gold. Other equipment that may be required for a variety of situations could be improvised by the miners themselves or with the help of a blacksmith. Initially even the most basic tools and hardware were unobtainable at Kiandra, but as stores began to open newly arriving miners were able buy them on site. Thereafter, as disappointed prospectors began to leave the field, they were only too happy to sell their now obsolete equipment to newcomers (Tybussek 2015).

Some miners who arrived at the field found it hard going, being unable to find sufficient gold to support their efforts and pay for food or provisions. However, a number of prospectors were fortunate enough to find work for wages, either employed digging for larger mining concerns, doing building work, or carting material. Others who did not fare well were desperate to sell their equipment so that they could afford to travel home (Sydney Morning Herald 19 April 1860: 2).

The prospect of deteriorating weather with the change of season was a continual ongoing topic of consideration for all. Not many people had experience of the high country in winter, but the few local residents able to give advice told of the weather unpredictably turning very harsh, with freezing conditions and heavy snow drifts. Certainly Commissioners Lynch and Cloete viewed the diggings as being a summer only enterprise, with Lynch proposing that he would stay until the first fall of snow, at which time he would immediately close the camp. (Sydney Morning Herald 29 March 1860: 4). Various newspaper reports cautioned those considering travelling

distances to the goldfield that they should hold their plans for the following season. The Sydney Morning Herald (28 February 1860: 3) was 'recommending people who have not embarked not to do so until the spring, as it is evident these diggings cannot be worked in the winter'. The Sydney Morning Herald of 20 March 1860 (p.5) went further, saying 'The idea of making winter diggings here is absurd, though from what I learn, many foolhardy individuals contemplate trying the experiment'. Yet despite these warnings from newspapers and the authorities alike, as 1860 headed into autumn the rush for gold carried on with more prospectors, many inexperienced and ill prepared, arriving daily.

As if to highlight the point, in early February a severe storm struck, levelling all the miner's tents and damaging much of their mining equipment installed in or near the streams. Most miners were ill prepared for colder weather, without winter clothing and with calico tents that were a feeble and flimsy buffer for the Kiandra conditions. While the storm provoked hundreds of miners to pack up and leave, nevertheless more were making their way to the field. In addition, the bout of adverse weather seemed to steel the resolve of others in the field, who voiced their intention to stay the winter at Kiandra in order to keep secure their claims and continue to mine. To do this they proposed to construct timber huts and purchase suitable blankets and clothing to combat the cold (Empire 25 February 1860: 6).

Fortunately, the flow of supplies to the diggings began to pick up over the first few months of 1860. By late February basics became more freely available as the road to Kiandra was improved. Two butchers and three slaughterhouses began operating and a few provision stores started up, one owned by the Pollock brothers. A Mr William Kidd erected the first licensed hotel, being a slab building roofed with zinc (Northern Times 14 March 1860: 4), and in addition, unlicensed public houses, known colloquially at the time as 'sly grog shops' were sprouting up (Sydney Morning Herald 5 April 1860: 5).

The layout of habitation at the diggings was quite haphazard at the outset, with tents often pitched close to the river and where the gold was being won. Thereafter, especially with falling evening temperatures, some miners began to aggregate at a site that became known as Camp Town, situated on the southern side of Pollock's Gully just below the timberline. When the Commissioners thought of laying out of a formal surveyed township, this was the site they first envisioned. However, as the settlement swiftly organically grew, business establishments including butcher shops, amusement venues and sly grog shops began being built opposite, on the northern side Pollock's Gully. Early in April, the Commissioners and the government surveyors decided to formally situate the township on the northern side of the gully. This area thereafter became known as Township Hill. Being situated on slopes the location was sited in a better situation with regard to flooding and wheeled traffic accessibility than Camp Town. The new Township was drawn up on crossroads formed by the intersection of 'Telegraph' street (running north-south and joining the

Cooma to Tumut road), and a thoroughfare running east-west up and down the hillslope that became known as 'Broadway' (Tybussek 2015; Empire 15 March 1860: 5; Empire 4 May 1860: 3; Illawarra Mercury 8 May 1860: 4).

The reason some miners wished to stay on site, even during the winter months when the ability to mine would be more than limited, was to protect and keep hold of their claims ready for the new mining season. By and large, the miners who were most keen to do this were those whose claims were most productive and paying well – generally those located closer to the centre of the watercourses. As explained by the Sydney Morning Herald (9 May 1860: 6) 'Numerous applications have been made to register river claims, but the Commissioner has declined in every case to accede to the request, presuming as he does that it would be impossible to protect them from seizure or "jumping" when the general rush ensues in the spring. Those who hold golden claims, therefore, are reduced to the necessity of either selling out or shepherding their ground till such time as the season will permit of its being worked to advantage'.

In order to prepare for winter, not only were provisions such as food, warm clothing and firewood, etc, to be laid up, but preparations could also be made so that at least some mining could be carried out if the weather permitted. Working the drainage lines under snow and melt would be impossible. However, upslope and across the sides of valleys, gold bearing ground could be worked with the assistance of applied water, even if the results were less rich than the streams. This was reported at the beginning of May:

During the winter, surface sluicing will constitute the chief employment of those who remain in Kiandra. There are now ten or twelve heads of water being conveyed in by races from the gullies around the township, and applications have been lodged for at least twenty more. The present surface hill and other hills as yet untouched will all be washed to the rock as soon as the parties now occupying claims thereon, take their departure (The Sydney Morning Herald of 4 May 1860: 5).

There are now no less than twelve races in course of construction for the purpose of box and ground sluicing in the winter months, at which period it is presumed much of the ground at present in working will be abandoned and left available for those who purpose wintering on the diggings (Sydney Morning Herald 9 May 1860: 6).

Two different types of races were used in the various mining operations at Kiandra. One style of race, and the first to be employed, was dug to temporarily divert the course of a waterway in order to allow excavation of the bottom of a channel. These were sometimes installed at bends in the river, but some also extended for a considerable distance along the course of a stream. In March 1860 a Mr Thomas Slater, working with a party of nine miners, 'cut a race at a bend of the river, about five or six miles below the township, built a dam, and prospected the river bed for about 300 yards' (Sydney Morning Herald 24 March 1860: 5).

The other style of race was a 'race-line' which was used to harness the power of water in order to facilitate gold extraction, generally through sluicing. They were elongated man - made flumes that were constructed to convey water for hydraulic use in the mining. Most races were excavated by hand, employing teams of men using pick and shovel, although a few were made using horses to pull a bucket or scoop. They were constructed in 'V' or 'U' section, with a very gentle gradient following the natural contours of the hillslope. Smaller races generally tapped into springs or smaller watercourses to catch seasonal rainfall or snow melt, while larger ones conveyed water from header dams or more significant waterways (Checksfield 1995). Accordingly, the dimensions of races varied considerably. In the first months of mining at Kiandra it is noted that one race-line was some five feet deep, while lengths mentioned range from 50 yards to one and a half a mile long (Sydney Morning Herald 28 May 1860: 5).

Sluicing used the water supplied through the race-lines to wash out and break down gold-bearing earth, often from elevated terraces comprised of the remnants of old streambeds. The dislodged material then flowed down the faces of excavation and was caught in a 'sluice box' which was used to salvage the gold. The sluice box was a simple, long, open-ended wooden box that had grooves running along its base often with coarse matting placed between. When the earth and gravel was washed through the box, the heavier gold became stuck in the matting or caught in the grooves (Empire 7 March 1860: 2).

Initially, by far the richest mining area was along a limited stretch of the Eucumbene River. Mostly fairly paltry pickings at best were found by prospectors working other areas - the broader river corridor, fringes of waterways and on adjoining slopes. However, over time some success was had by persistent miners at sites away from the streams and on the hillsides of the Eucumbene valley. In May a good take of gold began to be extracted from Surface Hill, located to the northeast of the Township. The gold found there was being recovered by sluicing, and because of this the site was seen as an area which could be mined over winter. Thereafter sluicing in various areas around the township, at areas including Whipstick Gully, Jackass Flat, Chinaman's Flat and Pollocks Gully, began to flourish.

Moreover, the discovery of abundant gold at New Chum Hill in March or April 1860 provided further areas for later arriving miners to strike abundant gold away from the earlier claimed rich alluvial fields. The quizzical naming of the site extended from the manner in which it was discovered, as described by Moye (1959):

It was by a strange way of fate that New Chum Hill ... came by its name. A party of two or three men, newly arrived from Great Britain, pitched their tent beside that of another tent which belonged to a party of miners who were working a claim on a flat ... Next day the 'New Chums'; as all the new arrivals were called, inquired from the more experienced miners as to the most likely place to set in to work. 'Start and drive a tunnel into that hill yonder', answered one of them in a joke, indicating a place where

gold was least likely to be found. To the astonishment of everyone, and amid the jeers of the onlookers, the tunnel was driven into that hill. In a few days the gold was struck marvellously rich. ... The new chums made their pile in a few short months, and returned to Great Britain ... Hence the locality became known as New Chum Hill.

Elevated above the valley floor, New Chums Hill was another area which could be mined through the winter if conditions did not deteriorate too much.

With more arrivals the areas being worked began continually to broaden out, progressing along the banks of the river, the adjoining drainage lines and thereafter the valley walls and hillock summits. Soon the mining activity was reported as extending out for a distance of around 12 miles from the central area of Kiandra, but the further from the original site that mining moved the less rewarding the digging tended to become (Tybussek 2015). What regularly happened was that parties prospecting away from the main centre sometimes hit small pockets of payable ground. When word got out, there was great excitement with the promise that another rich site had been discovered. More often than not, however, the gold was quickly exhausted and the diggers moved on.

This however was not the case with the Nine Mile, Four Mile, Three Mile, Rocky Plains (Snowy Plains?) and Tumut River (Twelve Mile) diggings, all of which turned out to be more productive permanent in nature. The Nine Mile and Four Mile diggings in particular proving to be generally more rewarding for the miners who worked there (Scott 2008). Later in the year the Maitland Mercury and Hunter River General Advertiser of 1 September 1860 (p.2) reported:

Nine and Four Mile - Here all parties seem to be doing well. Many are undertaking large and expensive works - scarcity of water is the only drawback to the former; but I have no doubt that the pure element will be more abundant as the spring advances. The party of the big tunnel have now advanced some 170 feet straight into the hill. They are just beginning to get to the gravel. It is to be hoped their enterprise will meet with a due reward. At the Four Mile there are at least two hundred people - all doing well. Six hundred is about the number at these two localities, with a dally increasing population.

When the first snow fell many miners left, which had been the recommendation of the Commissioners. At the same time newspapers were also warning that stores at Kiandra would not be able to keep supplying essentials if more people showed up with the intention to stay for the winter and the place became snowbound. Meanwhile, those residents of Kiandra who proposed to stay put for the winter refocussed their energies on constructing housing and sturdy storekeepers' tenements that would afford reliable shelter from the weather. These buildings were mostly constructed from weatherboard, although more rudimentary huts were built from bark, slab, or logs. By mid-May about twenty substantial structures had been put up in the Township, while another sixty to seventy were in the process of being

built (Sydney Morning Herald Saturday 12 May 1860: 5). By June the weather had turned more variable, and any mining that was carried out was primarily sluicing or surface mining on the hillsides. In addition, a lot of work was being conducted building more races to convey water to the sluicing sites.

Between February and April in 1860 the population at Kiandra was at its peak. Andrews (1901) stated that 'in February and March it was estimated that 15,000 men were on the field'. Some other sources also cited the number of people in the district at that time as being around 15,000 (Moye 1959; Smith 2006; Cooma-Monaro Express 1956). However, more conservative estimates place the uppermost figure at closer to 7,000 – 8,000 (Tybussek 2015; Gant-Thompson 2008). From the peak figure in 1860 the numbers of miners steadily fell, due primarily to a lack of success, the threat of the approaching winter, or a combination of both. Thereafter, the long-term population of Kiandra gradually waned, following the declining pattern of gold production. By 1863 the Sydney Morning Herald (10 March) reported the population of Kiandra as 'being not very large'. The number of people in the town that year was estimated to be about 650 and nine years later, in 1872, the population of the town and its surrounding area had fallen to some 350 people (Smith 2006).

On 4 June 1860 the Chinese first arrived at Kiandra. The event was noted in the diary of Bank of New South Wales agent at Kiandra, George Preshaw - 'Eighty Chinamen arrived; I was talking to their head man, who told me he expected there would be 20,000 of his countrymen here in less than six months'. While this forecast figure did not eventuate, nevertheless the number of Chinese to work at Kiandra peaked at around 700 in July and August 1860. This figure made up about twenty per cent of the town's total population (Smith 2006).

Preshaw's diary entry indicates that the first group of 80 Chinese to arrive were intending to mine, working as a collective under the control of a headman in a manner that by and large proved successful for the Chinese across the goldfields. When they first arrived, they started out by mining by reworking old diggings that had been abandoned by the European miners. At the start of July, a further 200 Chinese arrived, having travelled north from Beechworth, and by mid-July about another 100 made their way from the Shoalhaven, through Cooma, heading to Kiandra. There were at least 700 Chinese miners at Kiandra by then, located in a camp by themselves (Smith 2006).

In addition to teams of miners, some Chinese came as individuals to ply their trades, such as storekeepers, butchers, bakers, tailors and doctors. When they arrived, the Chinese started residing in small groups scattered around the township. Thereafter, over time, they established minor camps at Chinaman's Flat - a few miles to the north of the main town; Jackass Flat – located just north of the township near New Chum Hill; and at Pollock's Gully. However, in early July 1860 Commissioner Cloete became aware of complaints against the Chinese

being levelled by the European miners (Smith 2006). In order to avoid unrest between the two groups he organised to have the main Chinese camp established on a hill facing the Government Camp, about one-kilometre east of the township. As reported in the *Sydney Morning Herald* (30 June 1860):

The Chinese Camp is a little to the east of the township, pretty comfortably sheltered under the brow of a small rising piece of ground. The Commissioner has requested them to remove under the shelter of another hillside, a small distance to the right, which a number of them have done, and thereby opened another settlement apart from all Europeans.

Gold Mining: The Tintangara Field

Mr. Thomas Grice said that he heard some report of gold being discovered in the neighbourhood of Tintangra, (sic) and in consequence, he and James Ellis prospected in that part and got some specks (*Goulburn Herald* 28 March 1860).

Despite the fact that considerable gold mining operations took place along Gooandra and Tintangara Creeks through the latter half of the 1800s and into the very early twentieth century, records of these undertakings and their precise nature remain comparatively scarce. While Higgins and Scott (1991) have posited that local prospecting was most likely initiated by miners based at the Six Mile diggings sometime after 1864, indications exist for an earlier mining interest in the Gooandra area and what seems a natural expansion of exploration through the landscape from Kiandra directly in the wake of the major ‘rush’ of 1859. Mention is briefly made of good finds being made on the ‘Tantandra (sic) and Gibson’s Plains’ by January 1860 (*The Maitland Mercury and Hunter River General Advertiser* 7 February 1860) with a ‘new gold-field ... at Tan Tangara (sic) Plains’ supporting forty diggers reported early the next month (*The Sydney Morning Herald* 11 Feb 1860). Initial returns must have been promising; note of a ‘New rush’ reported at ‘Tintangara Creek, one of the heads of the Murrumbidgee’ soon followed precipitating movement of numerous parties into the mountains via Tumut over the course of the following several months (*The Hobart Town Daily Mercury* 18 February 1860; *The Maitland Mercury and Hunter River General Advertiser* 21 August 1860). In a correspondence compiled at the end of August, it was stated that six or seven flood races had been cut on Tintangara Creek (*The Sydney Morning Herald* 10 September 1860). However, by late winter the shallower gold-bearing deposits appear to have been all but worked out and the number of individuals engaged on the field was dropping notably, one report stating that: ‘The Tintangara Creek diggings have been abandoned as not sufficiently payable, by all parties but one, who have undertaken the blasting of some rocks in the bed’ (*The Maitland Mercury and Hunter River General Advertiser* 1 September 1860). Another contemporaneous account conveys a similarly negative impression of rapidly declining yields but differs slightly giving the number of parties on the Tintangara field as ‘about four’:

Rough's party, the prospecting one, being still engaged cutting their flood race, in which they have much blasting. A party of Frenchmen are turning another tributary of the Murrumbidgee, which runs through the Long Plain; they got inducing prospects in the bank. Another party, it is stated by Mr. Allen, of Tumut, are engaged higher up the same tributary, and have obtained coarse prospects with the dish ... On the Tantangara, two persons are at present engaged in a search for a gold-bearing quartz reef; they have not yet secured promising inducements to lead to the belief that is such as they are in search of (*Empire* 7 September 1860).

The introduction of blasting and a shift to actively seeking out signs of gold on locally elevated features and within reefing geological structure is of note. Despite descriptions of the continuing pursuit and processing of surficial deposits (i.e. the creation of substantial water races and panning) it is also apparent that the exploration of 'made' hills (i.e. locally elevated landscape features deemed to be composed at least partially of relict gold-bearing deposits and/or containing promising geological strata – see Brough Smyth 1869: 157) by digging shafts in search of quartz reefs or an additional gold-bearing 'bottom' was now taking place (*The Maitland Mercury and Hunter River General Adviser* 21 August 1860). From this information it may be inferred that the Tantangara and Gooandra Creek workings were following an evolutionary path already well underway at Kiandra where the depletion of more readily won alluvial gold was leading to exploration and dynamiting of quartz reefs in the drainage lines and adjacent hills.

Very little information on the Tantangara gold field after the modest 'rush' of 1860 is apparent. Higgins and Scott (1991) make note of the continued use of the old hut at Gooandra by a small group or groups of miners up until the sale of the building to Fred Lampe in 1903, but the nature of the diggers' mining pursuits and the scale of their tenure is unknown. Given the seemingly low number of remaining prospectors on the field it is possible that two miners 'belonging to a party of four who are working on one of the small creeks that form the Tantangara River' that were reported lost in the local bush for three days and nights in 1866 may have been associated with the group using the hut (*The Tumut and Adelong Times* 5 November 1866).

Following this phase, the lure of potential wealth or at least acceptable returns for the effort appear to have been enough to maintain a small mining presence on the field for another few decades. A succinct report published just after the turn of the century provides some indication of the scale of operations:

On Tantangra, above the 12-mile, Kiandra, Messrs. Chaproniere and party have been making good money mining for alluvial gold. There are also three other parties on good gold in the same locality. The gold, we

are informed, is worth over £4 per ounce. (*Adelong and Tumut Express and Tumbarumba Post* 30 May 1902)

and, from *The Sydney Morning Herald* (3 February 1902):

KIANDRA, Saturday. W. Paterson and Paterick are earning wages at their claims at Tantangara.

It is of interest that alluvial workings are mentioned given the related very rapid decline in yields from the courses of the creeks in the first year of the field. It may be reasonable to speculate that, aside from possible expansion into previously unworked areas, more methodical reworking of earlier phase diggings and/or use of more advanced techniques could have been taking place. Higgins and Scott (1991) state that hydraulic sluicing was being carried out on Gooandra Creek as late as 1912 and that this was 'probably the last mining on the creek' although the source for this information (possibly gained from oral history) is not given. Complaints from trout fishermen regarding water pollution in Tantangara Creek attributable to upstream gold mining were certainly being aired at this time (*The Daily Telegraph* 26 October 1912; *The Sydney Morning Herald* 20 November 1912).

More highly evolved and intensive methods for extracting gold from the Tantangara field appear to have been in the planning stage at a minimum by the late 1890s and into the early twentieth century. In 1899 G. N. Marks expressed the intention to extend his successful Kiandra gold-dredging operation to include Rocky Plain, Six Mile and Tantangara Creek, these locations at the time being seen as comparable to the Eucumbene River field in terms of potential yield (*The Manaro Mercury and Cooma and Bombala Advertiser* 1 December 1899). Similar to the machine mining of the flats of the Eucumbene River, the planned Tantangara dredge was to be of barge type housing a boiler-operated revolving bucket winch. By the middle of 1899 at least 100 acres of Tantangara Creek had been identified as 'an ideal dredging area' and were pegged and bored as part of an application for a special mining lease in Marks' name (*Evening News* 31 August 1899; *The Manaro Mercury, and Cooma and Bombala Advertiser* 15 December 1899). An official application for the dredging lease, submitted on the 25th of August 1899 and notified in April 1901, and subsequently extended to incorporate a total area of 140 acres of the bed of Tantangara Creek and adjacent lands, was accepted and the leases granted on the 29th of June 1901 (*The Manaro Mercury, and Cooma and Bombala Advertiser* 15 April 1901; *The Worker* 22 June 1901; *The Daily Telegraph* 29 June 1901). However, despite the considerable level of anticipation conveyed in the press and the publication of the approved leases being ready for delivery (*Adelong and Tumut Express and Tumbarumba Post* 10 September 1901), no further mention of the proposed construction of the dredge and any opening of operations at Tantangara by Marks is evident in the following years. A notice posted in the Government Gazette indicates that Marks' lease of 26 acres in Portion 62 at Tantangara was cancelled for

non-payment of rent on the 30th of June 1903 (*Government Gazette of the State of New South Wales* 30 June 1903 (333): 4803).

A subsequent application for a dredging lease at Tantangara made by Francis Joseph O'Brien in December 1911 was officially notified on the 30th of March 1912 (*Government Gazette of the State of New South Wales* 3 April 1912 (47): 2171). The application schedule was published in the *Cooma and Bombala Advertiser* (1 April 1912) with the following area description:

... parishes of Tantangara and Gooandra, county of Wallace, embracing part of the bed and banks of Tantangara Creek, and flats adjacent thereto, commencing about 2½ miles above the junction of Tantangara Creek with the Murrumbidgee River, and extending thence up the creek for about 100 chains; 29 acres 3 rods 16 perches ...

Considerably smaller in mechanical scale than the pontoon dredges of Kiandra, the envisaged mining was to make use of a terrestrial hydraulic elevator rather than a floating unit. While O'Brien's proposed venture does not seem to have generated the publicity or expectation associated with Marks' planned enterprise of a decade before, due to concerns with downstream water quality it was certainly met with controversy. An article published in the *Wagga Wagga Express* (11 April 1912) in direct response to O'Brien's application raised the possibility of the lease being sanctioned on the grounds of potential water pollution and stated that an inquiry into the matter was due to be held by the Cooma Warden at Kiandra on the 1st of May 1912. Nonetheless a lease appears to have been granted as notices were subsequently published in the *Government Gazette* for due rent on Dredging Lease No. 4 at Tantangara held in O'Brien's name in the following years (*Government Gazette of the State of New South Wales* 17 September 1913 (150): 5764; 16 September 1914 (163): 5607). In early 1915 a notice was released of a proposal to cancel O'Brien's dredging lease; this being finalised soon afterwards for non-payment of rent (*Government Gazette of the State of New South Wales* 17 February 1915 (25): 1083; 3 March 1915 (39): 1421).

6.4 FORESTRY

Timber getting has a long history in the Snowy Mountains. From the very earliest days of squatting, timber was essential for constructing yards and buildings, and as a fuel for cooking and heating. This tended to operate at an individual need's basis up until the mid-nineteenth century, when timber mills started to be established as commercial enterprises (Turner 1992; Sullivan and Lennon 2004).

John Belcher, an American engineer and miller, and John Thomas, his son-in-law and bullock drayman, are reported to have operated a sawmill above the snow line during the initial gold rush at Kiandra (Thomas 1962; Neal 1988: 42). The Belcher's Mill, which was located on Gang Gang Creek (Turner 1992), was where the Thomas

family resided for six months during summer, retreating to their property at Lobs Hole during winter. John Thomas' son, Charles, credits the Belcher's Mill with cutting nearly all the timber for Adaminaby and Kiandra (Thomas 1962). However, it is the Broadhead family that is most commonly identified as the pioneers of the timber industry in the region (Plate 5). James Broadhead began sawmilling operations at Kalkite with a basic pair of sawpits that were in operation from 1867 to 1875 (Turner 1992: 270, 274). The sawpits were then upgraded to a water driven system in 1875, then in 1885, Broadhead moved his operations to Alpine Creek (Plate 6), just west of Gang Gang Creek, to be closer to the main areas of alpine ash growing near Kiandra (Turner 1992: 274-276).

The alpine ash (*E. delegatensis*), also known as mountain ash, was renowned for its versatility as a light timber that is easily cut, whilst also providing structural integrity for joinery and as a timber that does not buckle or warp. It was also the timber used for the early skis, known as Kiandra butterpats. It is unclear whether the term "alpine sawmills", which actually applied to mills operating in sub-alpine and montane zones, was a reference to the timber milled, the location of early mills on Alpine Creek, or both (Turner 1992).

While Alpine Creek continued to be a centre of sawmilling, the move from water power to steam was made in 1893 and other steam powered mills were established during the twentieth century at Badja, Swamp Creek, Alpine Hill and Providence, with diesel and/or electric mills eventually built at Old Adaminaby and New Adaminaby (Turner 1992: 270). Timber continued to be an important regional resource well into the mid-twentieth century with harvesting for the Snowy Mountains Scheme, which also saw new families entering the industry as migrants came to work on the scheme (Sullivan and Lennon 2004).

Migrants who came to the Snowy Mountains to work on the Snowy Mountains Scheme also became involved in the eucalyptus distilling industry. Most notably there were German and Yugoslav migrants running a still at Morris Creek (Pearson 1993; Hill 1994). Lobs Hole was also the site of a eucalyptus distilling operation following the end of the copper mining operations at the beginning of the twentieth century. The still appears to have been relatively short lived though and closed following a collapse in the market (Pearson 1979).

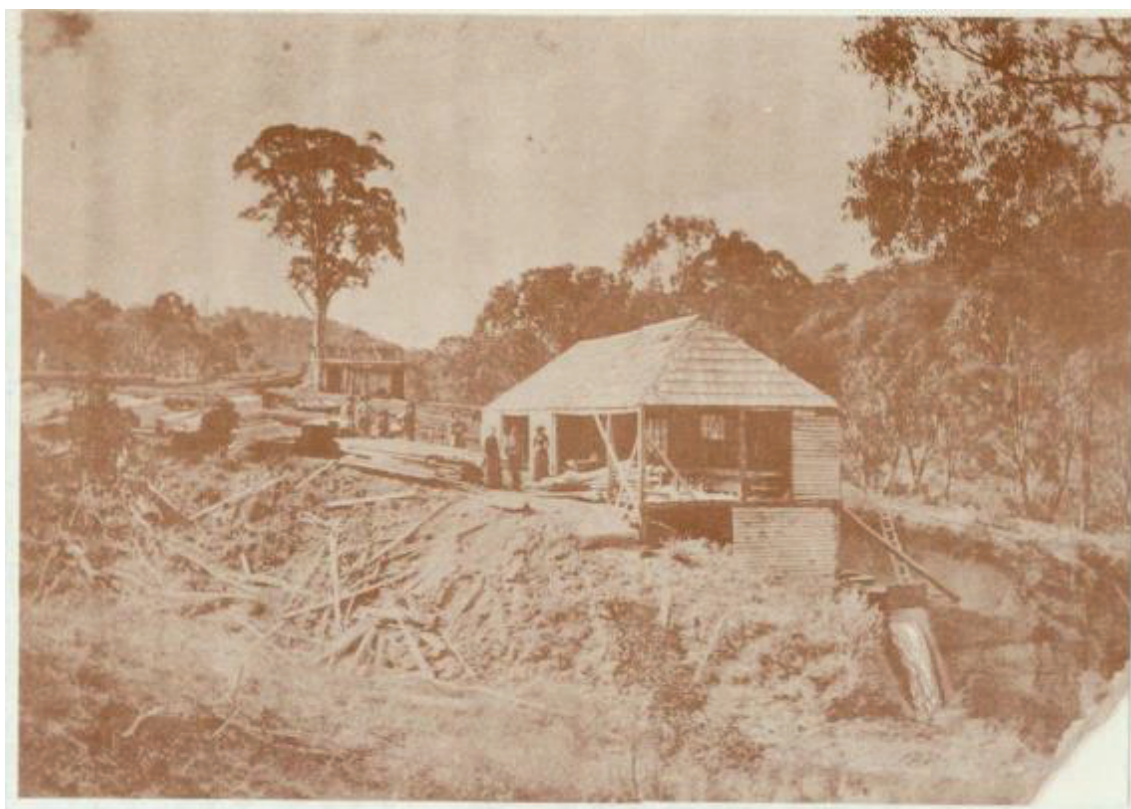


Plate 6 Broadheads Alpine Creek Sawmill. Source: Steve Brayshaw.

6.5 TOURISM IN THE SNOWY MOUNTAINS

As early as 1861, newspaper correspondents at Kiandra were reporting the skiing taking place there. The Sydney Morning Herald carried an article on 28 July 1861 that said 'Some of our young men do not mope over the fire now, but they have made Lapland shoes, and taking a long stick in each hand, move about. On the worst days they amuse themselves with sliding and some have come down a hill in a right grand style'. This was the first recorded reference to skiing in Australia (Moye 1959: 62).

By 1870, skiing carnivals were well organised and were regular events in Kiandra. The first ski club, The Snow Shoe Club, was formed at Kiandra, probably in the 1870s (Plate 7). Skiing at Kiandra was popularised by Sydney based, but locally born photographer, Charles Kerry, in 1896. Reports of snow conditions and the winners and place getters in the annual races regularly appeared in regional newspapers and the Sydney Morning Herald from the mid-1890s onwards. Kerry wrote in 1906 that Kiandra was the 'recognised centre of the sport' in New South Wales (Hueneker 1987: 20, Ryman 1970: 12, Smith 1996: 18).



Plate 7 Skiers; Kiandra.

Tourism in the region was established primarily in relation to the winter recreations which the district offered. As noted above, snow shoeing and skiing was originally adopted by Kiandra miners in the 1860s. Thereafter, these activities became an emergent recreational pastime with the establishment of the Kiandra Snow Shoe Club, probably in the 1870s, and the subsequent broader publicity of these winter sports from the mid-1890s onwards (Hueneke 1987:20). At the same time following the example of European and American attitudes, there was an increasing notion, amongst those who could afford the diversion, of the benefits provided by sanatorium retreats.

Trout fishing also began to grow in popularity around the turn of the nineteenth to twentieth century. Work had begun to stock the waterways with trout, and by 1904 Yarrangobilly River was rated amongst the top trout fishing rivers in NSW. Accommodation had been available at Yarrangobilly Caves House since 1888, and from 1906 land began to be set aside in the Snowy Mountains for “public recreation” (Merritt 2007: 39).

In May 1905, at the instigation of Sir Joseph Carruthers, the Premier of New South Wales, a new government body was established aimed at promoting tourism and immigration. An outcome was the establishment, in 1905, of the Intelligence Department, whose duties included the management of the Government Tourist Bureau. Significantly at the time, tourism was closely linked with immigration and

the Bureau's roles were in part viewed as facilitating the populating of the State through its promotions and by encouraging Australian residents to visit Sydney and New South Wales regional areas. In 1908, the Intelligence Department was renamed the Immigration and Tourist Bureau, and, from its early years, the Bureau had control of caves resorts at Jenolan, Yarrangobilly, Wombeyan and Abercrombie (State Records of New South Wales 2005).

With the growing popularity of snow sports and the increase in the patronage of hospice retreats located in havens away from the city, such as the Blue Mountains and Bowral, the Bureau seized the opportunity to play a more entrepreneurial role when it initiated construction of the Hotel Kosciusko at Diggers Creek in the Snowy Mountains (Gregors 1992: 190). The Hotel Kosciusko was opened in 1909 and provided quality accommodation in the snowfields which, in conjunction with the construction of a road to the summit of Mt Kosciusko, resulted almost overnight in the decline of Kiandra as a major tourist destination. The Bureau's aim was to present the hotel as the premier holiday and health resort in Australia and to attract visitors from across the country as well as travellers from as far away as New Zealand, England, America and India (Tourism New South Wales 2005). Skiers immediately flocked to the new hotel and in the year of its opening the Kosciusko Alpine Club was formed (Hueneker 1987:90). Less than two years later the hotel had been extended to include a ballroom and the complex ultimately housed a wide range of facilities including a picture theatre, post office, bank, golf course and tennis courts (Gregors 1992: 190).

The construction of the Hotel Kosciusko in 1909 diverted popular attention from Kiandra as a skiing venue. By the 1920s, the centre of skiing in the Snowy Mountains had moved to Perisher and later to Thredbo. In 1957, the first commercial ski development was initiated at Thredbo, based on a lease granted by the Kosciusko State Park Trust, and two years later, commercial developments commenced in Perisher Valley (Good 1992: 138, Ryman 1970: 12).

Horse breeding was an early component of the pastoral character of the region, and as the herds of brumbies grew, so did the importance of horses and the associated folklore (HO&DUAP 1996: 119). Brumby running has been a notable activity in the Snowy Mountains during the twentieth century (Higgins 1991). In the 1960s horse rides into the hills from Kiandra were popular (Hueneker 1982:205) and horse riding continues to be a popular recreational activity in KNP (Glenn Stroud NPWS pers. Comm.).

The Kosciusko State Park was reserved in 1944. From the beginning, it has been noted that part of the character of the park is the fact that the landscape contains natural and cultural heritage, of which Kiandra is a central and key example (Moye 1959). The Park's first origins were the public recreation reserves of the early 1900s

around Mt Kosciuszko, known at the time as the Snow Mountains National Chase. The Chase began as area of some 25,000 hectares, that had almost doubled in size by the 1920s (Merritt 2007: 39).

The 1920s also saw substantial increases in the number of campers and hikers. With the tourists came an increased focus on the “preservation” of the mountains and the role of the area in recreation. It was lobbying from recreational users of the Snowy Mountains that contributed to the establishment of the Kosciusko State Park (Merritt 2007: 40-42). At the same time the Park was proclaimed, the NSW government was redistributing grazing leases in the snow belt. Tensions already existed between recreational visitors and pastoralists and debate still continues over the merits of allowing grazing within what is now KNP (Merritt 2007).

6.6 SCIENTIFIC RESEARCH

The Alps are one of the most researched environments in Australia. Scientific research has encompassed the early scientific explorations of Dr John Lhotsky, Baron Dr Ferdinand von Mueller, Paul Edmund de Strzelecki and includes the later research of the meteorologist Clement Wragge, geologists Reverend W. B. Clark, Alfred Howitt and T. W. Edgeworth David, and ecologists such as Maisie (Fawcett) Carr, Alex Costin, M. Gray, C. Totterdill and D. Wimbush. Environmental research in the alpine environment includes the Cooleman Plain Karst area, other glaciation research sites of David Moraine, Guthrie Saddles, Perisher Creek exposure and the Railway Embankment.

Josephine Flood’s (1980) archaeological research pioneered understanding of Aboriginal occupation of the Alps (Sullivan and Lennon 2004). More generally, MacDonald and Haiblen (2001) have also noted the importance of the Alps in the development of theories of science in relation to human interaction in the natural environment.

6.7 WATER MANAGEMENT AND THE SNOWY MOUNTAINS SCHEME

Arguably, the resource within the Snowy Mountains that has been most consistently and continuously exploited over the past two centuries is water. Almost from the time of the [European] discovery of the Snowy Mountains, men (*sic*) of broad vision have given thought to ways of controlling and using the abundant waters which are the source of three of Australia’s greatest rivers – the Murray, Murrumbidgee and Snowy (Moye 1979: 66).

There was the initial water powered flour mills of the 1840s, then the 1860s saw the first significant engineering feats with construction of water races and dams to enable hydraulic sluicing and later power mine batteries on the gold fields at Kiandra. Water races were also instrumental to pumping operations at the mine

shafts at places such as Lobs Hole (and based on our study, also for agriculture). Similarly, the gold mining resurgence that Kiandra saw with the introduction of the dredges was reliant on the control of water (Moye 1959; HO&DUAP 1996; Pearson 1979).

The first proposal to divert the flow of the Snowy River for irrigation purposes was put forward in 1884. P. F. Adams, the Surveyor General of NSW, suggested that the Snowy River at Jindabyne could be diverted to the Murrumbidgee at Cooma (Moye 1959: 66). This was a somewhat prophetic vision of what was to come in the twentieth century. However, it wasn't until the end of the First World War that the idea of harnessing the water for electric power generation was actually proposed by the NSW Public Works chief electrical engineer, William Conn (Moye 1959 66; McGoldrick 1998: 9). It was then following the end of the Second World War, that the Commonwealth and State Governments decided to act on such proposals. Once the decision was made, the Snowy Mountains Scheme progressed with surprising speed. A summary of some key milestones in the project is provided in Table 14.

The Snowy Scheme comprises seven power stations (Blowering, Guthega, Murray 1 and 2, and Tumut 1, 2 and 3), a pumping station at Jindabyne, 16 dams and 145 kilometres of tunnels and pipelines (Snowy Scheme 1993). It is the largest engineering project that Australia has ever seen, and it has become a symbol of Australian achievement and multiculturalism (Sullivan and Lennon 2004).

Table 11 Overview of milestones in the planning and delivery of the Snowy Mountains Scheme (Diesendorf 1961; Moye 1959: 67-68).

Date	Milestone
1884	The concept of diverting water from the Snowy River was contained in a submission to the New South Wales Royal Commission on the Conservation of Water.
1891	The first arch-dam was built near Perth to create the Victorian Reservoir.
1944	Kosciuszko State Park declared.
1946	Commonwealth and NSW governments jointly initiate further investigation of the Snowy Mountains scheme.
19 Aug 1947	A Premiers' Conference addresses the potential use of the waters of the Snowy River, appointing a technical committee representing the Commonwealth, New South Wales and Victoria, chaired by Dr Louis Loder, to investigate the river's use for both irrigation and power generation.
1948	The technical committee recommends adoption of the scheme.
7 July 1949	Snowy Mountains Hydro-electric Power Act is passed by the Commonwealth Government.
1 Aug 1949	Snowy Mountains Hydro-electric Authority (SMA) established, and William Hudson appointed as commissioner.
17 Oct 1949	The construction of the scheme began with Governor-general William McKell firing the first explosion. Prime Minister Ben Chifley also attended. The works began with the construction of temporary camps and access roads to Jindabyne and Kiandra.
Nov 1949	The first SMA camp is established at Three Mile Dam.

Date	Milestone
1950	Survey, geotechnical investigations and drilling commenced. Access roads were built to Island Bend and Tumut Pond. Work began on upgrading the stock route from Penderlea to the camping area at the Thredbo Diggings, which ultimately became part of the Alpine Way.
1951	Preliminary work, conducted on horseback by Snowy Engineer Bill Gilfillan, was commenced investigating the possibility of establishing a track between Geehi Wells and Tom Groggin. An agreement was struck on 16 November between the Commonwealth of Australia and the United States of America establishing a co-operative programme of technical training and assistance. Ghent's Camp (later to be called Saddle Camp and then Cabramurra) is established. Construction of Guthega Dam, Guthega Power Station and associated tunnels commenced. The tender for this work went to the Norwegian company Selmer Engineering Pty Ltd. The construction was finally completed in 1955 - this was the first piece of the scheme to be started and completed so is quite an important piece of the story as it proved the concept for the rest of the scheme (and also helped pay for it).
1952	Construction on the Eucumbene River of the Adaminaby Dam began. Camps at Munyang, Guthega and Perisher were established, a township was built at Island Bend, and construction of the village of Cabramurra was commenced. A 22-kilometre-long all-weather investigation track was built between Swampy Plain River at Geehi and Tom Groggin.
1953	The Interim Snowy Mountains Advisory Council is appointed. Call goes out for tenders for the first phase of construction. In April the contract for an 11-kilometre extension of the Alpine Way from Tom Groggin to Leatherbarrel Creek was let. The Guthega diversion tunnel was completed. Eucumbene Portal camp was established, and the Eucumbene township constructed. Schools were erected at Cooma North, Island Bend and Jindabyne Dam and the Authority's head office in Cooma was completed and occupied. Investigations for the Eucumbene - Tumut tunnel and the Tumut 1 power station are complete, and designs finalised.
1954	Major contracts were let, including those for the Eucumbene – Tumut Tunnel, the Tumut Pond Dam, the Tumut 1 Pressure Tunnel and the Tumut 1 Power Station. English Electric won the contract for the turbines for Tumut 1, and A.S.E.A. from Sweden gaining the contract for generators. The breakthrough of the Guthega Tunnel by Selmer Engineering occurred in May. The Cabramurra township was completed, and the school opened.
1955	The decision was made to increase the final electrical capacity of the Scheme by 50 percent by way of building bigger power stations where conditions permitted. Commissioner Hudson directed that the track forming the early Alpine Way be upgraded. Storage commenced at the Guthega Pondage and the first release of water through the Guthega Power Station occurred on 25 January. Work began on the Tumut Pond Dam and Tumut 1 Pressure Tunnel, with tunnelling commencing at Eucumbene Portal. Guthega Dam and Power Station were completed, with the first power supplied to the New South Wales system on 21 February. Prime Minister Robert Menzies officially opened the Guthega Power Station on 23 April. During a week in May, Kaiser-Walsh-Perini-Raymond, the company contracted to build the Tumut tunnels, set a world hard rock tunnelling record by driving a 21-foot diameter tunnel a distance of 402 feet. Construction of the Alpine Way commenced.

Date	Milestone
1956	Kaiser-Walsh-Perini-Raymond bettered their tunnelling record on six occasions throughout the year, extending it to 484 feet in a six-day working week. They began work on the Eucumbene Dam in June. The company Etudes et Enterprises completed a 1300 feet access tunnel into the Tumut 1 Power Station site. The Duke of Edinburgh visited the Scheme and on 27 November poured the first skip of concrete on the Tumut Pond Dam. The first house from Old Adaminaby is moved to its new site.
1957	Acting Prime Minister Sir Arthur Fadden closed the gates at the Eucumbene Dam to commence filling the lake. The Premiers of New South Wales and Victoria attend celebrations to mark the breakthrough of the 14-mile Eucumbene – Tumut Tunnel. President Diem of South Vietnam visited the Scheme. Construction commenced on the Upper Tumut Switching Station. The transfer of buildings from Old Adaminaby was completed.
1958	After less than two years of construction the embankment of the Eucumbene Dam is completed. Prime Minister Robert Menzies closed the gates of the Tumut Pond Dam as part of the official opening ceremony. Happy Jacks Dam was commissioned. Thiess Brothers won the contract to build Tooma Dam and the Tooma-Tumut Tunnel – this being the first major contract let to an Australian company.
1959	The Snowy Mountains' Agreement came into operation on 2 January with the Snowy Mountains Council replacing the Interim Advisory Board. The first concrete was placed in Tantangara Dam. 18 September Senator Spooner fired the last charge to make the breakthrough in the Deep Creek/Tumut Pond section of the Tooma-Tumut Tunnel. Princes Alexandra visited the Scheme. Dame Pattie Menzies opened Tumut 1 Power Station on 31 October. Access tunnel to Tumut 2 is completed and the length of the machine hall. The Eucumbene – Tumut tunnel was completed and brought into service. The first interconnection of the New South Wales and Victorian power systems was made and the first concrete placed in the Tumut Dam.
1960	The Tantangara Dam was completed six months ahead of schedule in February and water storage in the Tantangara Reservoir commenced on 3 March. The breakthrough of the Tumut 2 Pressure Tunnel took place on 26 March. The Tooma – Tumut Tunnel was completed and the breakthrough in the Murrumbidgee – Eucumbene Tunnel accomplished.
1961	The Tooma – Tumut Tunnel started operation in January and the Murrumbidgee – Eucumbene Tunnel was officially opened in February. Water storage in the Tooma Reservoir commenced in May. The Tumut Dam began operation in August, and the Tumut 2 Pressure Tunnel and Tumut 2 Tailrace Tunnel came online in October. The contract for the construction of the Eucumbene – Snowy Tunnel, the 2 nd longest water tunnel in the world, was awarded.
1962	The Upper Tumut works, comprised of the Tumut 1 and 2 Power Stations and the Tantangara and Tooma projects, were completed and brought together into full production in April. Prime Minister Menzies officially opened the Tumut 2 Power Station on 5 May. Work commenced on the Island Bend – Geehi Tunnel, the Geehi Dam, the Murray 1 Pressure Tunnel, the Murray 1 Power Station and various pipelines. The Khancoban township was completed.
1963	Queen Elizabeth and the Duke of Edinburgh visited the scheme from 8 to 11 March. Work began on the shopping centre at Jindabyne in October.

Date	Milestone
1964	The Eucumbene – Snowy Tunnel breakthrough was made in June, followed by the first section of the Murray 1 Pressure Tunnel in July. In November David Fairburn, Minister for National Development, fired the final charge to make the breakthrough of the Snowy – Geehi Tunnel. Earthwork commenced on the Blowering Dam. In this year the construction effort peaked, with a labour force of 5,800 workers provided by both contractors and the Authority. In December the township of Jindabyne was opened by Sir Eric Woodward, the Governor of New South Wales.
1965	Concreting of the final section of the Eucumbene – Geehi Tunnel completed. Island Bend, Murray 2 and Khancoban Dams completed. In August the Eucumbene – Snowy Tunnel was commissioned.
1966	The Snowy – Geehi Tunnel and the Murray 1 Pressure Tunnel entered operation, as did the Khancoban and Geehi Dams. The first waters of the Snowy – Murray development were diverted west to the River Murray catchment and the first unit of Murray 1 Power Station commenced commercial operation. Queen Elizabeth and the Queen Mother visited the scheme from 4 to 6 April. New contracts were let for the Jindabyne and Blowering Pumping Stations and the Jounama Dam.
1967	Kosciusko National Park was proclaimed. On 17 April the Jindabyne Reservoir started storing water. The Murray 2 Pressure Tunnel broke through in July and that month Prime Minister Harold Holt officially opened the Murray 1 Power Station. The American Society of Civil Engineers voted the Snowy Mountains Hydro-electric Scheme one of the seven civil engineering wonders of the world.
1968	Construction completed and first irrigation water released from Blowering Dam. Jounama Dam was commissioned in April. The largest single project of the Scheme, the construction of Talbingo Dam and Power Station, commenced. New South Wales Premier Robin Askin released the first water for irrigation from the Blowering Reservoir in September. The Jindabyne – Island Bend Tunnel and the Murray 2 Pressure Tunnel commenced operation, and the Island Bend township was closed down as the workforce was relocated elsewhere.
1969	Murray 2 Power Stations commenced commercial operation having been opened by David Fairburn, Minister for National Development. The Cascade Aqueduct came into service. Jindabyne Pumping Station was officially opened by Snowy River Shire Councillor Leo Barry.
1970	Princess Anne visited the Scheme from 25 to 27 April. Murray Dam 2 and the Geehi aqueduct came into service and the embankment of Talbingo Dam was completed.
1971	Water storage in the Talbingo Reservoir commenced on 1 May, and the reservoir reached its minimum operating level on 4 September. Blowering Power Station began operating.
1972	The largest of the Snowy power stations, the Tumut 3 Power Station, commenced operation, having officially been opened by the Governor General Sir Paul Hasluck. Snowy Mountains Engineering Corporation formed.
1973	The lower Tumut works - Tumut 3 Power Station, Jounama Dam and Blowering Dam projects were all completed, as was the Tumut 3 Pressure Pipeline.
1974	The last six units of the Tumut 3 Power Station were brought into operation and thus construction of the Scheme was completed.

Date	Milestone
1980	The Governor-General Sir Zelman Cowan visited the Scheme from 20 to 22 August.
1990	The Institution of Engineers, Australia, recognised the Snowy Mountains Hydro-electric Scheme as a National Engineering Landmark.
1993	The Council of Australian Governments agreed to corporatize the Snowy Mountains Hydro-electric Scheme.
1997	The American Society of Civil Engineers named the Snowy Mountains Hydro-electric Scheme as an International Historical Civil Engineering Landmark. Complimentary legislation was passed in the Commonwealth, Victorian and New South Wales parliaments to proceed with the corporatisation of the Snowy Mountains Hydro-electric Authority.
1998	Snowy Mountains Hydro-electric Authority won the Australian Maintenance Engineering Excellence Award. The New South Wales Government announced and conducted a public enquiry into environmental issues arising from the flow of water from the Snowy Mountains Hydro-electric Scheme.
1999	The Fiftieth Reunion celebrations were held on the shores of Lake Jindabyne attracting more than 20,000 former employees, contractors and families.
2000	The findings of the Snowy Water Inquiry were announced on the banks of the Snowy River below the Jindabyne Dam by the premieres of Victoria and New South Wales. These included the implementation of a return of flows to the Snowy River of up to 212 gegalitres, and 142 gegalitres to increase the flow of the Murray River.
2002	Snowy Mountains Hydro-electric Authority was corporatized with assets and liabilities associated with power generation transferred to Snowy Hydro Limited.
2017	On 15 March Prime Minister Malcolm Turnbull announced the expansion of the Snowy Hydro Scheme in the form of the proposed Snowy 2.0 project.
2018	On 15 March the Australian Government announced it would purchase Snowy Hydro Limited, buying out the New South Wales and Victorian Governments shares in the company.

The Snowy Mountains Scheme was an ambitious undertaking that required an enormous workforce, infrastructure and support services (Plates 8 & 9). Whilst construction of the original scheme was completed by 1974, some features that formed part of the original plans were never constructed including a tunnel between Tantangara and the Yarrangobilly River (Plate 10).



Plate 8 Lobs Hole Survey Camp at the junction of the Yarrangobilly and Tumut Rivers. Source: Steve Brayshaw.

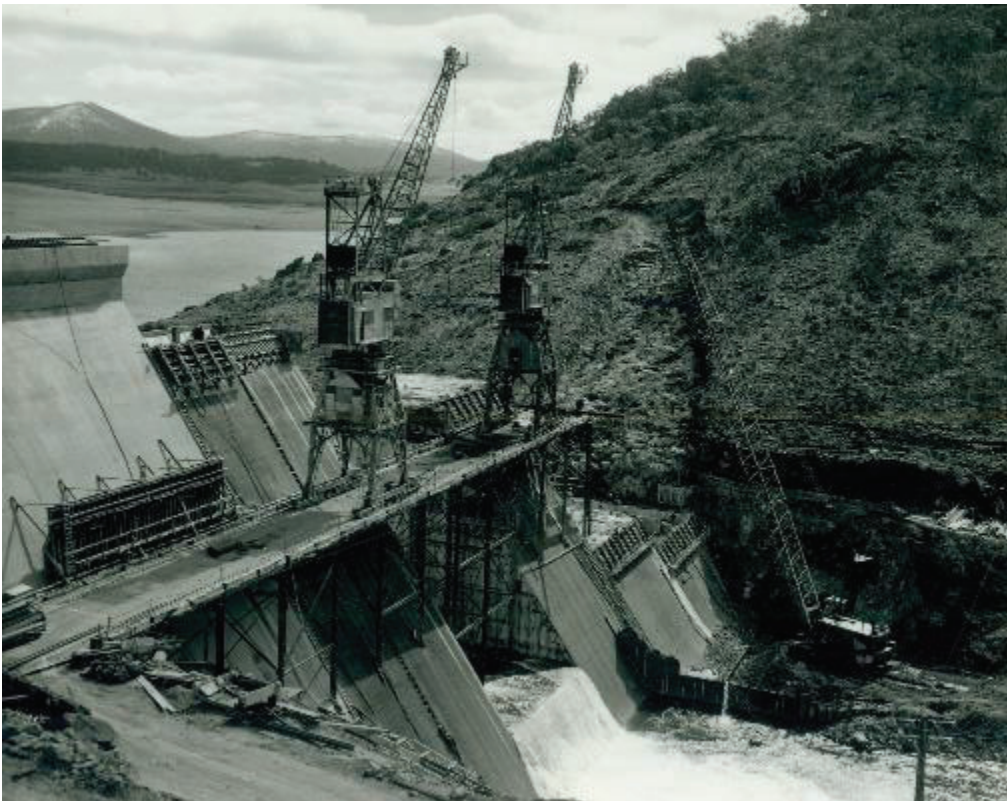


Plate 9 Tantangara Dam wall during construction. Source: Steve Brayshaw.

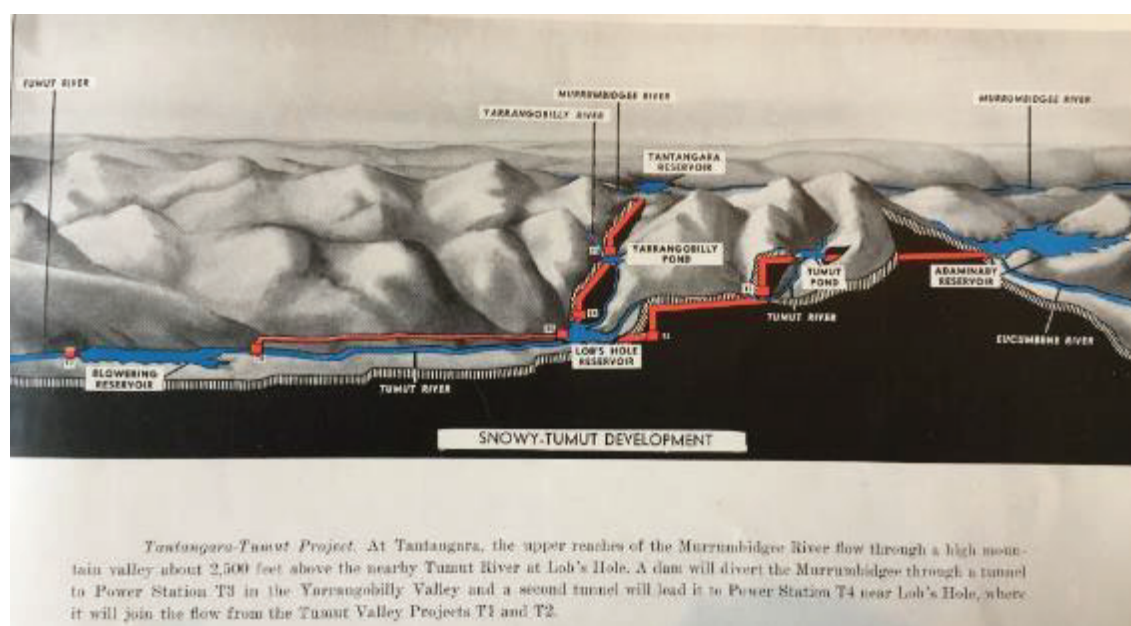


Plate 10 The current project in its original plan. Source: David Rosetta, Glough.

The use of the Snowy Mountains for irrigation and domestic water supply has been a major part of the cultural history of the area. The Alps is a vitally important source of water for NSW, Victoria, the Australian Capital Territory and South Australia. The importance to eastern Australia of water harvesting in the Alps, and the need to ensure good quality water supply for farmland and population centres in the surrounding lowlands, led to the protection of much of the alpine and sub-alpine area.

The decision to declare the Kosciusko State Park was based on water catchment and recreation requirements. Increased land use restrictions in the Alps from the 1930s until the 1970s was driven primarily by catchment concerns. Soil conservation measures in Victoria and New South Wales in alpine areas were driven by the need to protect the catchment flowing into the Hume Reservoir and later to protect the pondages and flow systems for the Kiewa Hydro Electric Scheme (KHES) and the Snowy Scheme. The Snowy Scheme diverted water westwards for irrigation and harnessed the falling waters in the diversion to produce hydro-electric power.

The Snowy Scheme was a major post-war government reconstructive initiative and a defining event in Australia's history as it employed very large numbers of non-English speaking people displaced by the effects of World War II. It is also referred to as an important foundation in Australia's multiculturalism and the ethos of the Snowy Mountains as a place of endeavour and hard work (Sullivan and Lennon 2004).

6.8 TOWNS, VILLAGES AND CAMPS

European settlement in the Alps began with the pastoral homesteads of the first squatters. While towns started to develop at centres such as Cooma, Tumbarumba and Tumut, the localities at Kiandra, Adaminaby and Ravine (at Lobs Hole) are examples of settlements in the mountains that developed in response to mining booms.

Kiandra was settled in direct response to the gold rush that began there in 1859, with a settlement that at its peak extended well beyond the gazetted town (Gant-Thompson 2009). Adaminaby on the other hand began as a camping spot known as “Adamindumee” during the middle of the nineteenth century. It then developed into a town in 1860 with the growth in the goldfields at Kiandra (Moye 1959: 61).

The village of Ravine, at Lobs Hole, is unique as one of the only mining towns in the Alps that was not principally based on or supported by gold mining (Kaufman 2002). The earliest references to a boarding house, or rest house at Lobs Hole appear to come from the 1860 newspaper article that describes the route through Lobs Hole from the Kiandra gold fields (Sydney Morning Herald, 7 December 1860). Two rest houses are mentioned: one at the punt across the Tumut River and one further up the valley towards Kiandra. The actual Lobs Hole, which was purportedly (but by no means certain) named as such due to the crayfish that were found there (Methodist, 22 February 1908), is now under water at Talbingo Dam, below Sheep Station Ridge (NSW NPWS 2012).

Charles Thomas, the grandson of one of the early settlers at Lobs Hole (John Thomas), recalled how his grandfather, James Thomas, ran bullock teams to the Kiandra gold fields at the start of the gold rush. James Thomas ran the bullocks with his three sons. When they made their first delivery to Kiandra they arrived as winter was starting to set in. When they awoke in the morning they found the bullocks were gone and a foot of snow on the ground. After some searching, James found the bullocks in the Lobs Hole valley, below the snowline, where James and his sons then spent the winter (Thomas 1962; Neal 1988: 42).

The following year, James died in an accident and Charles’s father John bought out his brothers to continue the bullock team business. John also became involved in the timber industry through his father in-law, John Belcher. Together they setup a sawmill above the snowline that operated for six months of the year. John Thomas also had a bullock team and carted copper ore out of Lobs Hole (George Thomas pers comm). John Thomas then selected a 2,560 acre property at Lobs Hole where he could winter with his family. That property was Sheep Station Hill. Charles, who was born in 1881, recalls how there was no school at Lobs hole in those days and he had to go to Kiandra to board, but after the Blackman family moved onto a neighbouring property (the original West Pinbeyan Station), schooling at Lobs Hole

became viable (Neal 1988: 42). The records for the Lobs Hole school indicate that a provisional school was in operation from February 1892 to August 1893, then again from September 1905 until December 1908, before a public school opened in 1909 (NSW Department of Education 2017) – discussed further below.

The actual village at Ravine developed during the copper mining boom at the beginning of the twentieth century. The village was formally proclaimed in 1910 and at its peak it included Julius Forsstrom's Washington Hotel, a boarding house, government school, butcher, blacksmith, and police station. The population of the settlement is thought to have peaked at around 500 before declining rapidly when mining came to an end between 1917 and 1919 (Pearson 1979). The Yan family, relatives of the Yans of Yan's Store at Kiandra, were one of few families remaining by 1920, the Washington Hotel and the police Station having closed a year earlier (HO&DUAP 1996). The vast majority of the buildings burnt down, the last going in 1964. The only existing above ground structural remains are the Washington Hotel's pisé wall ruins (NSW NPWS 2012).

Both Kiandra and Lobs Hole/Ravine saw fairly rapid decline with settlements effectively abandoned by the 1930s and 1920s respectively. Whereas Adaminaby continues today, albeit in a different location. The twentieth century saw a new phase in the towns and camps of the Snowy Mountains that accompanied the construction of the Snowy Mountains Scheme.

An estimated 100,000 workers from over 30 different countries were employed over the years on the Snowy Mountains Scheme. In 1959, the number of workers peaked at just over 7,000 (Rodwell 1999). In addition to the workers themselves, there were the families who followed them and others who moved to the area to provide services for the new population. Cooma alone saw an increase from 2,000 to 10,000.

Entire settlements (Jindabyne and Adaminaby) were relocated prior to the flooding of valleys for the dams. Temporary and permanent worker's villages were also established throughout the mountains. By the mid-1950s three new town and various camps had been established. The Snowy Scheme towns were established at Island Bend, Cabramurra, Khancoban and Talbingo. The Kaiser Group established work camps at Happy Jacks and Sue City, and Thiess Brothers had camps at Bella Vista and Thiess Village (McGoldrick 1998: 10). Tantangara Village was built halfway between the highway and Tantangara Dam (Plate 11). Numerous other smaller and more temporary camps were also necessary in more remote locations.



Plate 11 Tantangara Village and men's camp during the construction of the Tantangara Dam. Source: Steve Brayshaw.

Over the years, on-site housing was provided at twenty-one different centres, including a house for the Radio Operator and his family at Kings Cross, near Cabramurra. An estimated 700 demountable houses were moved from site to site. Other accommodation included tents, 20 bed barracks and eight foot square one man "snow huts". These snow huts were built in Cooma on sled bases to enable transport and setup in the mud and the snow (Rodwell 1999: 3).

There are no clear figures for the number of temporary camps that were established for the more mobile elements of the Snowy Scheme workforce. However, each of the stream gauging stations (which exceed 120 in number) had a small camp set up for their construction. One such camp was set up at Wallaces Creek, the exact location of which is unknown. There was survey, drilling, horse, summer, winter, road, construction and flying camps, the latter being camps established to reduce the need to return to the base camp every night. Camps were established throughout the mountains, often in relative proximity to one another, as the terrain was such that even short distance travel substantially reduced work efficiencies (Rodwell 1999: 3-4).

6.9 TRADE AND TRANSPORT

Traditional routes and pathways used by Aboriginal people through the high country are thought to have also been used in guiding early settlers and explorers into the district (Gardner 1991; Wesson 1994). These pathways have since helped navigate

the scientists, gold prospectors and recreation seekers through the Alps. For the majority of Non-Indigenous settlement in the Snowy Mountains and until after the Snowy Scheme commenced, horses were the primary means of transport (*cf.* Neal 1988).

Over the past 200 years, transport routes have evolved in response to the areas being accessed, the forms of transport being utilised, and the goods being carried in and out. While bridle trails and stock routes established transit routes that would later be formalised for bullock teams and carts, in some instances the nature of the terrain was such that routes more suitable for wheeled vehicles needed to be formed. The road to Tumut through Lobs Hole is just one such example.

Copper mining at Lobs Hole is an example of a venture that was entirely reliant on identifying efficient transport routes. Mining operations were initially dismissed due to the nature of the roads in and out of the valley. By the end of the nineteenth century when Adolf Reeckman, Julius Forsstrom and William Forrester started copper mining, the ore had to be carried out either on horseback or in bullock drays. However, the bullock drays struggled with the existing roads and a new route was established up towards Yarrangobilly, that was referred to as the “Toll Bar” (Toll Bar Ridge). John Thomas, who ran the local bullock teams at Lobs Hole, had the contract to transport the copper to Gundagai Railway Station. His son Charles recalls the difficulties of the bullock teams traversing the steep road out of the valley, which required double teams of bullocks to pull the copper drays (Thomas 1962; Neal 1988).

Access was also a critical issue in the survey, design and construction of the Snowy Mountains Scheme (Plate 15). During the early investigative works, packhorses were used and proved invaluable in very steep country. Land rovers were introduced in 1949 (Neal 1988). Access to some areas was such that “light” four-wheel drives were prohibited. For some of the early camps, tracked vehicle or “heavy” four-wheel drive was required (Rodwell 1999: 4).

Approximately 160 kilometres of new vehicle tracks were established for the Snowy Mountains Scheme (McGoldrick 1998: 10), a task that Major Clews was once again instrumental in:

As well as planning and directing their technical work, he constructed scores of miles of packhorse tracks which were the only arteries of access for the surveyors, drillers, hydrographers, geologists and investigation engineers all of whom would look to the Major for his advice and guidance in how to exist in this most forbidding country while carrying out their own duties. (Gough 2004: 37).

The diary of Major Clews (1952) provides valuable insight into the realities of the roads that were being used by the Snowy Scheme, as well as the communications network that had been established at Kings Cross.

Left Lobs Hole, 1670 feet above sea level in a Land Rover for the camp at Dry Dam. 4900 feet. A week's survey work for me and chainman is projected. Ten and a half miles (and twenty creek crossings) in one and a half hours is good going here. We are now on the Monaro Highway and the driver has easy going to Kiandra. There has been light snow, but only fragments of the big winter drifts remain. Up the Snowy Mts. Hydro Electric Authority's road we reach Kings Cross, six miles out. The Authority's radio station here, keeps H.Q. in touch with its various camps and working parties. Height ASL 5300 feet. A good view of snow covered peaks – "for them as likes views and snow covered peaks". Our concern is not with the views. The driver launches the Rover on the river of mud that passes for a road to the Basalt Plateau. We come to grief. We unhitch the trailer; the 34 Rover barely scrambles up the rise. Passing a long rope back, the trailer is hauled to the top... ... At 7 am I set off for Tumut 1 power station site. Herb looking after the camp. A mile of rough walking brought me to the camp occupied last summer by a surveyor named Ghent. I walked down a bulldozed road. It is quite marvellous where the bulldozers can get and the operators are as game as they are made (Clews June 1952 in Gough 2004: 35-36).

The survey and engineering for the roads was itself a considerable feat. An example is the road from Cabramurra to the Tumut 1 Power Station, which entailed a 2,000ft drop in four miles with a maximum grade of 1 in 8, built to take 120 ton 64 wheel road trains (Gough 2004: 39).

6.10 IMMIGRATION

From the arrival of the first Aboriginal groups into the mountains, through until the present day, the Australian Alps have seen different phases of migration with people coming from different parts of the nation and the globe. During the nineteenth century, while the vast majority of settlers were of British and/or Anglo-Saxon backgrounds, there were also notable contributions to exploration from those of Polish descent. With the gold rush at Kiandra a sizeable Chinese population became established, with the Yan family being one example of a family that stayed on in the region long after the original miners had moved on. The Yans also settled at Lobs Hole, where there was a strong Finnish involvement in the copper mining during the late nineteenth and early twentieth century.

Probably the most famous migration events centre around the construction of the Snowy Scheme. There was a massive influx of migrants from all over Europe to work on the Scheme which needs to be understood in the context of the post World War II atmosphere. This is why the construction of the Snowy Scheme has become synonymous with the origins of Australian multiculturalism.

6.11 HISTORIC THEMES

The historical themes of a site, place, landscape or region are an important component of understanding the item's cultural significance. These themes can be relevant for instance in terms of associations with important people, events, cultural/social groups and technological developments and innovations. They are

also relevant in terms of assessing an item's rarity and representativeness. Historical themes are also intrinsic to the process of identifying potential research questions that might be applicable in the context of an item's scientific significance. Table 15 provides an overview of historical themes relevant to the Snowy Mountains. It has been formulated on the basis of the historical themes identified by the NSW Heritage Council (2006), which in turn are based on the Australian Heritage Council (2001) themes. The local themes identified for the Snowy Mountains are a synthesis of information compiled from existing heritage listings and the historical context of the region, as outlined above. It also draws on previously identified themes for the area. For instance, the Independent Scientific Committee assessment of cultural values in Kosciuszko National Park (Sullivan and Lennon 2004: 131) identified the following broad themes:

- Aboriginal history and heritage;
- Pastoralism;
- Mining;
- Logging, timber product extraction and silviculture;
- Water harvesting;
- Science, research and conservation; and
- Recreation.

These were a revision of themes previously identified through a symposium on the cultural heritage values of the Australian Alps (Scougall 1992). However, while such broad themes work well for summarising the history of the region, they can be cumbersome when trying to tease out the finer details specific to the local area or individual sites. The NSW NPWS (2001a, 2001b) have used the national and state thematic framework to identify 13 local themes for the Snowy Mountains. The themes identified below are an expanded version of the themes identified by NPWS.

This more detailed approach to the themes has been adopted for two main reasons. First, it utilises the framework of the standardised national and state themes (Australian Heritage Council 2001; NSW Heritage Council 2006). Second, it enables a means of linking items to specific local themes, where such connections are clearly identifiable, as well as the ability to:

- link items to themes of state and/or national significance, where relevant; and/or
- stick to broader thematic groupings where uncertainties exist, or limited historical information is available.

Table 12 Historical themes of relevance to the Snowy Mountains.

ID #	Australian Theme	ID #	NSW Theme	ID #	Local Theme(s)
1.0	Tracing the natural evolution of Australia	1.1	Environment – naturally evolved	1.1.1	Soil mountains
				1.1.2	Ore bodies
				1.1.3	Bushfires
2.0	Peopling Australia	2.1	Aboriginal cultures and interactions with other cultures	2.1.1	Bogong harvests and meeting place for 13 nations
				2.1.2	Aboriginal place names
		2.2	Convict	2.2.1	The role of convicts with a pardon/ticket of leave in early exploration and settlement.
		2.3	Ethnic influences	2.3.1	
		2.4	Migration	2.4.1	Non-Indigenous settlers
				2.4.2	Immigrant workers in the 19 th century (e.g. Chinese)
				2.4.3	Immigrant workers in the 20 th century (e.g. SMS workers)
3.0	Developing local, regional and national economies	3.1	Agriculture	3.1.1	Pastoral runs
				3.1.2	Flour mills
				3.1.3	Showgrounds and local shows
				3.1.4	Stock yards and stock reserves
		3.2	Commerce	3.2.1	Hotels and boarding houses
				3.2.2	Shops and stores
		3.3	Communication	3.3.1	Postal services
				3.3.2	Telephone network
		3.4	Environment – cultural landscape	3.4.1	Kosciuszko National Park
				3.4.2	Mining landscape of Kiandra and surrounds
				3.4.3	Aboriginal landscape
				3.4.4	Pastoral landscape
		3.5	Events	3.5.1	Aboriginal gatherings and ceremonies
				3.5.2	Arrival of Europeans
				3.5.3	Discovery of gold

				3.5.4	Drought
				3.5.5	Establishment of Kosciuszko Reserve/National Park
				3.5.6	Snowy Mountains Scheme
				3.6.1	Government sponsored exploration
				3.6.2	Independent exploration
				3.6.3	Industry sponsored exploration and mapping
				3.7.1	Introduction of trout
				3.8.1	Eucalyptus distilleries
				3.8.2	Timber getting and saw mills
				3.9.1	Recreation
				3.10.1	Electricity generation
				3.11.1	Prospecting
				3.11.2	Gold mining
				3.11.3	Copper mining
				3.12.1	Transhumance
				3.12.2	Cattle
				3.12.3	Sheep
				3.12.4	Horses
				3.13.1	Scientific expeditions
				3.13.2	Scientific research in the 20 th century
				3.14.1	Electricity generation
				3.15.1	Aboriginal pathways
				3.15.2	Early transport routes and links to the railway network
				3.15.3	Travelling stock routes
				3.15.4	SMA roads
				3.15.5	Fire trails and four-wheel drive access
				4.1.1	19 th century settlement
				4.1.2	20 th century settlements
				4.1.3	Abandoned towns
				4.1.4	Relocated towns

		4.2	Land Tenure	4.1.5	SMA camps and towns
				4.2.1	Squatting
				4.2.2	Robertson Land Acts
				4.2.3	Snow leases
		4.3	Utilities	4.3.1	Snowy Mountains Scheme
				4.3.2	Harnessing/distributing water
				4.3.3	Power before the Snowy Mountains Scheme
		4.4	Accommodation	4.4.1	Kosciuszko Huts
				4.4.2	Tents and camp sites through time
				4.4.3	Miners' huts
				4.4.4	Homesteads
				4.4.5	SMA workers' accommodation
5.0	Working	5.1	Labour	5.1.1	Shepherds and stockmen
				5.1.2	Miners
				5.1.3	SMA (SMHEA)
6.0	Educating	6.1	Education	6.1.1	Provisional schools
				6.1.2	Public schools
				6.1.3	Private schools
				6.1.4	Teaching English to the immigrant workers for the SMS
7.0	Governing	7.1	Defence	7.1.1	-
		7.2	Government and administration	7.2.1	Changing boundaries of counties and shires
				7.2.2	SMS and the planning and logistics at state and national levels
		7.3	Law and order	7.3.1	Settlement beyond the Limits of Location
				7.3.2	Gold commissioners
				7.3.3	Police stations and local policing
		7.4	Welfare	7.4.1	-
8.0	Developing Australia's cultural life	8.1	Domestic life	8.1.1	Nineteenth century mining households
				8.1.2	Families on pastoral stations
				8.1.3	Women and families on the Snowy Mountains Scheme

		8.2	Creative endeavour		-
		8.3	Leisure	8.3.1	Skiing
				8.3.2	Hiking
				8.3.3	Fishing
				8.3.4	Four-wheel driving
				8.3.5	Evolution of the National Park
9.0	Marking the phases of life	8.4	Religion	8.4.1	Places of worship
		8.5	Social institutions	8.5.1	Schools
		8.6	Sport	8.6.1	Skiing
		9.1	Birth and death	9.1.1	Hospitals
				9.1.2	Public cemeteries
				9.1.3	Private cemeteries
				9.1.4	Deaths on the construction of the SMS
		9.2	Persons	9.2.1	Explorers
				9.2.2	Pastoralists
				9.2.3	Miners
				9.2.4	SMA (SMHEA)
				9.2.5	Researchers
				9.2.6	Family dynasties

6.12 PREDICTIVE STATEMENTS

As outlined in the table above, the Snowy Mountains is an area that potentially contains heritage relating to a wide variety of themes that effectively encompass all the state and national themes. This is unusual, even for an area of this size. However, this does not necessarily mean that all themes or site types will apply within the project area.

The following predictive statements summarise the site types and themes that are most likely to be represented within the project area. Where possible, specific reference is made to landscape contexts and/or locales of known sensitivity.

- There is a high potential for remains of old transport routes, including bridle trails, bullock tracks, town roads, mining trails and access routes for construction of the Snowy Mountains Scheme. Remains may include road cuttings, culverts, bridges/fords and artificial surfaces. Ridge lines and valleys are both topographic contexts that are predicted to be particularly sensitive.
- There is a very high potential for remains of former pastoral stations and associated infrastructure (e.g. property boundaries, fence lines, homesteads, out buildings, shepherd's huts and yards). Such sites are more likely to occur on relatively level, elevated ground near reliable water and known access routes. The items most likely to be evidence are fence lines. However, there is also moderate to high potential for building remains/ruins.
- There is a high potential for survey markers (e.g. tree blazes, cairns and trig points).
- There is a very high potential for remains of mine workings and associated mining settlements. Evidence of mine workings may include costeans, shafts, adits, water races, dams, ore processing areas, access roads and tracks, and mine tailings and mullock heaps. Evidence of mining settlements may range from ephemeral tent and hut locations on mine leases through to more substantial residences in gazetted towns and/or separate portion selections.
- There is a very high potential for remains of the former township of Ravine at Lob's Hole. Evidence of the settlement may include structural remains such as extant building remains (e.g. footings, walls and/or hearths), cuts and fill for former building platforms, toilet/privy sites, rubbish dumps (middens), services (e.g. telegraph lines), exotic tree plantings, yards and former fence lines. The areas of highest potential are in and around gazetted town lots, known portion selections, and in the vicinity of known concentrations of mining settlements (e.g. Struggle Street).
- There is a high to very high potential for remains of workers camps associated with construction of the Snowy Mountains Scheme. These may include the

remains of quite ephemeral temporary camps and more formal longer-term camps. Such sites, particularly the more temporary and ephemeral camps, may occur throughout the study area. However, the more permanent camps are most likely to occur in association with known Snowy Hydro infrastructure (e.g. stream gauging stations).

- There is a high potential for evidence of recreational activities. These sites are likely to be quite ephemeral in nature. However, remains of campfires, tent sites and access trails.
- There is a high potential for isolated unmarked graves. Such sites would typically occur in association with former homesteads, mining camps and/or access routes. The Ravine cemetery is known to contain unmarked graves and at least 16 others could be in the wider Lobs Hole area.
- There is a high potential for items/places of intangible cultural significance. Such places may occur in any context. Information regarding such places may come to light through community consultation.
- There is a high potential for tree plantings (ornamental or fruit) and/or remains of gardens. These are most likely to occur in association with former homesteads and mining settlements.
- There is a very high potential for isolated items of moveable heritage. Such items may range from fragments such as bottle bases through to industrial plant such as machinery from mining and construction of the Snowy Mountains Scheme.

7. FIELD RESULTS

7.1 METHODS

A series of field investigations have been undertaken in parallel with the above desktop studies. Field survey has involved pedestrian and/or vehicle-based inspections of all areas of proposed impacts. Particular attention has been given to:

- previously identified heritage items;
- potential heritage items identified through desktop research; and
- locations and/or landforms of predicted high sensitivity.

For ease of presentation, documentation and use, the project area has been divided into discrete survey areas. These are defined according to geographic area, putative proposed impact, discrete road and the like. The Survey Areas are the framework for the presentation of heritage items, significance, and appropriate management and mitigation measures.

The area of the Exploratory Works and Main Project overlap at Lobs Hole Ravine and Talbingo. Accordingly, the results of the Exploratory Works assessment are included in this section.

The survey areas include the current project disturbance footprint and previous design option boundaries.

In most cases the field surveys for European heritage have been undertaken in tandem with the Aboriginal field surveys, which has meant that many areas of predicted lower sensitivity for European heritage have been subject to comprehensive levels of field investigation.

The field recording and mapping has been conducted using a mobile GIS system and paper recording forms. The location of Survey Units, Aboriginal objects and historic features has been collected using *Collector*, ArcGIS software. In order to ensure consistency in data collection, all field records were made on recording forms formulated specifically for the project. Three separate forms were used for recording Survey Unit data, Aboriginal Object data and Historical features data. The data collected forms the basis for the documentation of survey results.

Field recordings of potential heritage items have involved photographic records, mapping with handheld GPS devices as well as observations regarding fabric, artefacts, site condition and archaeological deposits. The aim of these recordings has been to compile sufficient information to assess the heritage significance of individual items and the broader landscape. It was beyond the scope of this

investigation to undertake detailed mapping or recording of sites within the project area.

Wherever possible, the identified sites, including both previously identified heritage items and newly identified sites, have been cross referenced to the historical context of the study area. This has been done in order to ascertain the relevant associations with individuals, events and places as well as categorize sites in terms of the identified historical themes. This information has formed a critical component of the subsequent assessments of heritage significance.

The location of historic heritage recorded during the assessment is presented in Annexure 5.

7.2 RESULTS

The site descriptions have been grouped by the area where they were recorded. Each of the following subsections includes a table that provides details such as site ID, site location, description, relevant historical themes and photos, mapping for all recorded items.

7.2.1 Talbingo/Tumut 3

The current land use in the Talbingo survey area is entirely the Talbingo Dam infrastructure and Tumut 3 power station (Plate 12).



Plate 12 Talbingo Dam wall; looking 270°.

Talbingo Dam/Tumut 3 power station was conducted in March 2018. There are no items of State or local significance within the Talbingo survey area. However, the

Tumut 3 power station and associated infrastructure is a component of the Snowy Mountains Scheme listed on the National Heritage List (NHL). The survey results are described in the table below.

The Talbingo Dam/Tumut 3 power station survey area is now outside the Main Works development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 13 Talbingo: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
T1	618004	6057994	Talbingo: Survey marker is in a laydown area on a hairpin bend. It is a cylindrical column on a square concrete base. It measures 1.2 m high by c. 0.3 m diameter.	SMA
T2	616528	6057468	area of rehabilitated laydown on both side of the existing dam road (~1 hectare). The site is strewn with fencing wire, metal, dumped gravel including a heavy metal door of an explosives safe. The site has been graded level. The potential for relics is high, but the site is comprehensively disturbed due to site rehabilitation works (Plate 13).	SMA
T3	616791	6058053	This site is an extensive area of quarry for construction of Talbingo Dam. The site occupies the existing valley floor (Plate 14).	SMA
T4	616837	6058123	Talbingo: Concrete survey marker. Remnant yellow paint with small round metal centre piece (Plate 15).	SMA
T5	616848	6058165	Talbingo: concrete obelisk shaped survey marker. Remnant yellow paint with small round metal centre piece.	SMA



Plate 13 Talbingo T2; looking 350°.



Plate 14 Talbingo T3; looking 30°.



Plate 15 Talbingo T4; looking 180°.

7.2.2 Lobs Hole Ravine

The field survey at Lobs Hole commenced in October 2017 and March 2018 and the results were documented in the Exploratory Works HCHAR (Dibden 2018). Additional work at Lobs Hole was conducted in October, November, December 2018 and February 2019. The Lobs Hole survey area has been subject to a comprehensive field survey.

However, in all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. In forested areas at Lobs Hole and Lobs Hole Ravine Road, undergrowth was often thick and sometimes impenetrable, especially if blackberry was present. Also, at Lobs Hole, blackberry thickets cover relatively large areas along the Yarrangobilly River and Lick Hole Gully. The flats at Lobs Hole were covered in thick grass.

There are no heritage items of State significance in the Lobs Hole survey area. Numerous heritage items are listed on heritage registers and these include several sites of local significance (s170). These are listed in Table 14. All Lobs Hole potential historic items are presented in the following table (Table 15), inclusive of those documented in Dibden 2018b. The historical sites recorded during Exploratory Works are summarised briefly in Table 15; detailed descriptions and historical references for these are provided in Dibden 2018b Appendix 3.



Plate 16 The mud walls of the Washington Hotel and stables (in foreground); looking 170°.

Table 14 Lobs Hole: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
4841			622450	6041700	Lobs Hole SMA Camp	According to KHA listing: <i>Lobbs Hole Camp (SMA) c1952-60s</i> <i>Current site - Complex/settlement ruin/site</i> <i>Description - SMA camp of tents and snow huts</i> Under Talbingo Reservoir	SMA
4611			622540	6041670	Lobbs Hole Village	According to KHA listing: <i>Lobbs Hole Village</i> <i>Current site - Complex/settlement ruin/site</i> <i>Description - Site of small hamlet on early route to Kiandra.</i> Under Talbingo Reservoir	Ravine
4608	8318 4850		625770 (KHA) The following GRs are incorrect: 625613 (OEH) 625913 (OEH)	6039615 (KHA) The following GRs are incorrect: 6039284 (OEH) 6038984 (OEH)	Lobs Hole/Ravine Cemetery (KHA); Lobbs Hole Cemetery site (OEH) Lobbs Hole Cemetery (OEH)	According to KHA listing: <i>Lobbs Hole/Ravine Cemetery</i> <i>Current site - Grave/cemetery</i> <i>Description - Site of cemetery.</i> There are two Lobs Hole Cemetery OEH recordings with incorrect grid references.	Ravine
4612	4849				Ravine Lobs Hole Village		Ravine
232		5046	625919	6038948	Washington Hotel (KHA); Ravine Hotel Ruin (OEH)	According to KHA listing: <i>Washington Hotel</i> <i>Alternative - Ravine Hotel</i> <i>Current site - Building ruin/site.</i>	Ravine

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
					Plate 16	See below – R20	
4335			626512	6038583	Yarrangobilly River Stream Gauging Station 2	According to KHA listing: <i>Yarrangobilly River SGS2</i> <i>Current site - Stream gauging or weather station</i> <i>Description - Site of stream gauging station.</i>	SMA
4518			626715	6038215	Weather Station	According to KHA listing: <i>Weather station</i> <i>Alternative - Ravine</i> <i>Current site - Stream gauging or weather station.</i> No longer extant	SMA No longer extant
		4846	626688	6038189	Powerhouse Site	See below – R12	Mining
		4847	626793	6038144	Building remains		Mining
4605			626685	6038297	West Pinbeyan Station	According to KHA listing: <i>West Pinbeyan Station (1885)</i> <i>Alternative - Ravine ruins</i> <i>Current site - Complex/settlement ruin/site</i> <i>Description - Head station on 1885 squatting run.</i> No longer extant. See below – R1	Pastoralism
4340			626609	6038096	Yan's House	According to KHA listing: <i>Yan's house</i> <i>Current Site - Building ruin/site</i> No longer extant	Pastoralism
4607			627270	6038040	Ravine Garden #2	According to KHA listing: <i>Ravine garden #2 c1880-1900</i> <i>Current site - Yards ruin/site</i> <i>Description - Fenced 'Gardens', probably for growing domestic produce.</i>	Ravine

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
		4845	626913	6038184	Lobbs Hole Copper Mine Water Race (OEH)		Mining
4606			627070	6037980	Ravine Garden #1	According to KHA listing: <i>Ravine Garden #1 c1880-1900</i> <i>Current site - Yards ruin/site</i> <i>Description - Fenced 'Gardens', probably for growing domestic produce.</i>	Ravine
		12255	626732	6038185	Mine Shaft; Lobbs Hole	See below – R9	Mining
231	5266	4844	626796 (KHA) 626813 (OEH) 626903 (OEH)	6038138 (KHA) 6038184 (OEH) 6038184 (OEH)	Ravine Copper Mine (KHA); Lick Hole Mine (OEH); Lobbs Hole Copper Mine (OEH)	According to KHA listing: <i>Ravine coppermine</i> <i>Alternative - Lobbs Hole Coppermine, Lick Hole Mine</i> <i>Current site - Mine</i> There are two Lick Hole/Lobs Hole Copper Mine OEH recordings with incorrect grid references. See below – R9	Mining
4869			627400	6038170	Wallaces Creek survey Camp	According to KHA listing: <i>Wallaces Creek Survey Camp (SMA) c1955-62</i> <i>Current site - camp site</i> <i>Description - SMA tent camp for survey work associated with the Tumut projects.</i>	SMA
4336			627760	6038340	Yarrangobilly River Stream Gauging Station 3	According to KHA listing: <i>Yarrangobilly River SGS3</i> <i>Current site - Stream gauging/weather station ruin/site</i> <i>Description - Site of stream gauging station.</i>	SMA

KHA id.	OEI id.	s170	Easting	Northing	Name	Description	Theme
4537			628012	6037783	Stable Creek Stream Gauging Station	According to KHA listing: <i>Stable Creek Stream Gauging Station (SGS)</i> Current site - <i>Stream gauging/weather station ruin/site.</i>	SMA
4520			626600	6037898	Ravine Ruin #2	According to KHA listing: "ruin (?) Alternative - (Ravine Ruins #2) Current site - Building ruin/site"	Ravine

Table 15 Lobs Hole: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
R1	626705	6038252	The site of the 1885 West Pinbeyan Station homestead; subsequently used as the mine managers (Lobbs Hole Copper Mine) residence and finally as the Yan house.	Pastoralism
R2	626715	6038275	Part of Lobbs Hole Copper Mine water race; subsequently used as water tank in Yans house.	Miscellaneous
R3	626741	6038287	Collection of stone and brick. Possibly a structure associated with the 1885 West Pinbeyan Station/mine managers residence, Yan house complex	Pastoralism
R4	626733	6038280	Possibly a structure associated with the 1885 West Pinbeyan Station/mine managers residence/Yan house complex	Pastoralism
R5	626755	6038236	Slag relocated from the smelter site	Mining
R6	626746	6038225	Probably a structure associated with mining or domestic occupation	Miscellaneous
R7	626730	6038227	Subtle depression may not be historic	Miscellaneous
R8	626758	6038195	Amorphous depression; may not be historic	Miscellaneous
R9	626708	6038205	Lobbs Hole Copper Mine: capped mine shafts	Mining
R10	626770	6038145	Lobbs Hole Copper Mine: No 1 Shaft, mullock and cage	Mining
R11	626830	6038106	Lobbs Hole Copper Mine: mullock and metal ore bucket	Mining
R12	626796	6038133	Lobbs Hole Copper Mine: concrete foundations for Pelton Wheel in riverbed	Mining

ID	Easting	Northing	Description	Theme
R13	626831	6038155	Lobbs Hole Copper Mine: 12 m long cutting likely to have been used for overhead tram for transporting ore from the mine to the reverberatory furnace	Mining
R14	626852	6038222	Lobbs Hole Copper Mine: reverberatory furnace ruin (it was blown up in the 1950s); a sparse scatter of bricks, slag and metal beams	Mining
R15	626789	6038361	Linear stone feature on valley floor, on southwestern side of Yarrangobilly River. The feature extends for ~10m, and runs east to west, with a post hole at the western end. A section of plain and chicken wire fence is also present across the surface and continues to the southwest across the adjoining flat.	Miscellaneous
R16	626734	6038350	The site comprises two piles/cairns of rock situated approximately 20 m apart. Each rock pile is approximately 1-2 m across and 50-80 cm high. There are three metal drums/tanks present in association with the rock piles.	Miscellaneous
R17	626691	6038278	A poorly defined/indistinct earth platform measuring c. 7 m by 4m and oriented NW/SE. Given the high disturbance in the area, the feature may not be historic.	Miscellaneous
R18	626690	6038313	Rabbit proof fence: netting and thick plain wire anchored with stones. Probably part of Yan's infrastructure as they were the last people to live at Lobs Hole	Pastoralism
R19	626732	6038249	A levelled pad measures c. 4 m by 2.5 m and is orientated 170°/350°. It is highly eroded. A sparse scatter of glass, pottery and metal appears to be associated with the feature	Miscellaneous
R20	625925	6038961	Washington Hotel ruin	Ravine
R21	625911	6038981	Depression and a sparse scatter of bricks and metal	Ravine
R22	625956	6038975	Potential earthen feature: The remains at the site comprise two north-south aligned building platforms that are distinguishable primarily as changes in vegetation, but also evidenced as subtle earth features	Ravine
R23	626002	6038989	Perhaps borrow pit for earth for walls of hotel	Miscellaneous
R24	626016	6038968	Two rectilinear depressions c. 2 m apart, each c. 1 m square and 30 cm deep.	Miscellaneous
R25	626047	6038931	Building platform: the site is a 6-7 m long building platform, aligned north/south. The platform is c. 3 m across. Brick and sheet metal are present on the surface at the southern end. Metal pipe and straps are also present.	Ravine

ID	Easting	Northing	Description	Theme
R26	625979	6038930	Mound of stone and earth measuring c. 4 x 1.5 m. Post holes and an ephemeral earth mound are present on the southern side of the stone mound. A few metres to the south west there is a shallow rectilinear depression. These features are interpreted as a probable fireplace and associated privy and cover an area measuring c. 15 x 15m.	Ravine
R27	625991	6038951	Depression and a sparse scatter of bricks and metal	Ravine
R28	625907	6038986	Stable associated with hotel comprised of three eroded pisé walls. The structure measures 8 m long by c. 3 m wide and is orientated E/W. The remains of the earth walls measure c. 2 m wide by 0.5 m high.	Ravine
R29	626088	6038941	Mound of stone and brick. An east-west aligned mound of stone and brick, c. 1 m wide and 4 m long.	Ravine
R30	626095	6038927	Rectilinear earth feature	Miscellaneous
R31	626062	6038842	Road (previously thought to have been a water race)	Ravine
R32			No record	
R33	626646	6038298	Excavation and bricks	Miscellaneous
R34	626490	6038585	Possible hearth; It comprises a low rectilinear mound of stone c. 2 m square. There is a possible earth platform extending out on the northern side of the mound that is possibly a building platform.	Miscellaneous
R35	626527	6038599	Rabbit proof fence: netting and thick plain wire anchored with stones; extends for at least 30 m along a southeast-northwest alignment	Pastoralism
R36	626532	6038628	Excavation possibly associated with SMA flying fox	Miscellaneous
R37	626531	6038635	Flying fox over the Yarrangobilly River. The southern component comprises a Colourbond, flat roofed shed erected on a levelled cutting, with a cable support on the southern side and cables running across the river to a single tower on the northern side of the river.	SMA
R38	626528	6038648	A besser block cubicle shed, with Colorbond gable roof, built on random rubble foundations on the north aspect slope leading down the river. The building is accessed by a wooden door on the southern side, and a series of flood level markers are situated down slope towards the river.	SMA

ID	Easting	Northing	Description	Theme
R39	625976	6038938	A square excavation measuring 1.8 m by 1.8 m. The excavation has been infilled but contains some old turn of the century glass. It is on the same contour as R27, and a similar feature. It is possibly a well or privy.	Ravine
R40	626491	6038602	Two rectilinear features. The first is a cutting into the hill slope that is approximately 10m long. The second is a more ephemeral cutting further downslope. The features are orientated NE/SW. Possible building platforms.	Miscellaneous
R41	626209	6038818	2 m long parallel alignment of stone, 1 m apart	Miscellaneous
R42	626188	6038847	Rosie Cook's lot. Comprises exotic plants (Apple, periwinkle, iris and quince tree?) that appear to be the remains of a former garden likely to be associated with a house site. The area is quite overgrown and the location of any former structures, or form of the garden is not easily discernible. There are numerous depressions and mounds over an area of c. 50 x 50 m.	Ravine
R43	626478	6038738	Rabbit proof fence from post to 135° and to 280°. grid ref at strainer post hole.	Pastoralism
R44	627856	6037972	Named by KHA as Stable Creek SGS, but it is on Wallaces Creek. It is locked; not operational. Wallaces Creek stream flows were measured intermittently at a Snowy Hydro operated stream gauge (410507) between 1969 and 1998; could be the same. Braided steel cable in north creek bank.	SMA
R45	627647	6038043	Extends from an unspecified source on Wallaces Creek (believed to be near junction with Stable Creek) to Lobbs Hole Copper Mine. It is on south side of Mine Trail Road and mostly intact until it becomes truncated by the existing road at grid ref: 627406.6038061. It appears that Mine Trail Road has been built on the race from that point, and west to where the race would have joined the steel pipe (R74) to take the water down eastwards to the mine.	Mining
R46	626107	6038720	Large pit; The cutting is up to 4m deep, at least 20 m across and approximately 40 m long (along north-south axis). Function unknown.	Miscellaneous
R47	626113	6038505	The new school (Ravine Public School) was built in 1910 and teaching commenced on 21 September 1910; school site with artefacts.	Ravine
R48	626537	6037912	This feature is an excavation measuring c. 10 x 4 x c. 1 m deep which contains stacked piles of sheet tin, corrugated iron and other metal, including roof capping.	Pastoralism

ID	Easting	Northing	Description	Theme
			Some of the stacks of tin are weighed down with cobbles and appear to be untouched since they were put in place.	
R49	626513	6037876	Semicircular stone wall measuring 9 m wide by c. 6 m deep; part of a circular feature. Stone wall made with massive natural boulders of 4-5 courses. Some rocks up to 90 cm long. The stone forms a flat platform for a horse or other to walk around driving a shaft attached to whatever mechanical device being uses ie chaff cutter, wheat grinding. The heavy metal whim nearby; adjustable, wedge locked. The feature is adjacent to shed remains which are believed to have been used by the Yans.	Pastoralism
R50	626514	6037905	In stone defined? shed platform c. 12m x 9m, frame complete with thick wire rope for 'lowering' bullocks; rear axle missing (could have been wooden and hence burnt)	Struggle St
R51	626509	6038767	Coronation mine	Mining
R52	624491	6040711	Fallen metal survey mark	SMA
R53	624526	6040729	Old cut and benched road	Transport
R54	627715	6038092	At end of Mine Trail probably SMA	SMA
R55	627688	6038087	BBQ possibly SMA or shire picnic site at end of Mine Trail; machine pressed bricks: early 20th century and other	Miscellaneous
R56	626685	6037837	7m x 1.5w x 1.4 deep; function unknown. Earth and rock mounded on downhill side.	Miscellaneous
R57	626619	6037937	Old cut and benched road alignment in the Struggle Street locale. It is aligned 30/°210° and measures c. 2m wide.	Transport
R58	626380	6038765	2 long metal pipes, one purposefully situated with one end propped up on rock base	Miscellaneous
R59	626093	6038964	Glass scatter in area 10 x 10m	Ravine
R60	626039	6038901	Police station platform and debris in copse of slippery elm; bricks, chicken wire, tin sheet metal, piece from mine water pipe, possibly used as water tank	Ravine
R61	626045	6038939	Possibly associated with police station brick and stone lined hole 2 x 2 x 1.5 m deep	Ravine

ID	Easting	Northing	Description	Theme
R62	626737	6038586	Possible shaft.	Miscellaneous
R63	626217	6038815	Pile of shale at Rose Cook's place. It is unlike the local rock found in the immediate locale and has been brought to the site. It measures c. 1.2 x 1.2 m and c. 20 cm high.	Miscellaneous
R64	626238	6038828	At Rosie Cooks place. A water race cut into the north margin of an alluvial terrace on the southern side of the Yarrangobilly River, with the spoil placed downslope to form a channel running parallel to the river (southeast to northwest). The channel is approximately 1m wide and 0.6 m deep. It extends for c. 170 m	Miscellaneous
R65	625525	6038178	The John Thomas homestead on Sheep Station Creek	Pastoralism
R66	626460	6038554	Excavated platform 5.6 m x 3.1 m with stone hearth	Ravine
R67	626662	6038515	Lobs Hole Central Mine - on NE side of river	Mining
R68	627128	6038321	Lobs Hole Central Mine - mine working on NE side of the river; not inspected for this project	Mining
R69	626599	6038259	Circular beehive brick kiln for reverberatory furnace. A zone of excavated soil at base of slope (hummocky and open rectilinear pit) with access road (R94), platform, cut), and remains of brick kiln. c. 50 x 40 m area.	Mining
R70	625696	6039199	A two-bay fire place constructed in two phases with concrete. It measures 2 m long x 0.95 deep x 0.6 m high. It is decorated with beer can pressings on the top.	Miscellaneous
R71	626420	6038250	Two building platforms cut into slope with rubble of a building in pile on slope above platforms. They each measure c. 10 m long by c. 5 m wide. The platforms are cut into a moderate gradient hillslope. Bridle family connections.	Ravine
R72	626171	6038205	The function of this feature is no known however, it is believed to be a stone furnace and possibly a lime kiln. It is a semicircular walled structure built against bedrock stone; the blocky conglomerate bedrock is used as the basis of the construction. The stone is laid with a mud packing mortar. It is partially faced but largely made with flat faced stone cobbles. On the downslope side is 1.6m high. Its diameter is 2 m. The front face on the inside of the rear wall is 1.85 m high. On both sides there is a pile of earth and rubble.	Miscellaneous
R73	626662	6038457	Mesh and plain wire fence	Pastoralism

ID	Easting	Northing	Description	Theme
R74	626744	6038106	Part of the Lobbs Hole Copper Mine water pipe. Located on steep slope/bank 10 e of Mine trail - it extends from west end of water race down steep bank to NE to Lobbs Hole Mine; parts of the pipe are in river further downstream	Mining
R75	627179	6037852	Lobbs Hole Copper Mine shaft? on M.L. 31 at east end of main lode. The site could not be found, and grid reference is suggestive only. See LRGM 2002:135. On M.L. 31 at east end of main lode	Mining
R76	626640	6038115	Scatter of domestic debris in area 15 x 15.	Miscellaneous
R77	626736	6038258	Does not exist, exact location uncertain; it was a Stephenson Screen (George Thomas pers. Comm March 2018)	SMA
R78	626550	6038172	Large live pine tree	Miscellaneous
R79	625868	6038969	Concrete pylons of old Powerline era bridge	SMA
R80	627183	6037988	Elizabeth Frazer's (nee Thomas) orchard	Agriculture
R81	627896	6037989	~1,100 m long earthen channel (assumed to be hand excavated) extending along the east side of the Yarrangobilly. It is located at the break of slope between the west facing simple slope of the High Ground and the Yarrangobilly flat. The depression is deeply incised (up to a meter in places) and a width of up to 4 m. Near its southern termination on the north side of Wallaces Creek, various disturbances are present where it seems to have been excavated out or eroded. The race was a part of Julius Forsstrom's work (see Plan in R45). It is assumed that it was originally built for transporting water (to the race R45 on Wallaces Creek) for the transport of water to the Lobbs Hole Copper Mine (see Plan in R45). Grid reference is nominal 628045.6038840 midway.	Mining
R82	627798	6038271	On water race: spring loaded cushioned front seat of car. 1.3 m wide. Old seat frame arched hub at front of seat for the drive shaft to run underneath; spring loaded adjustable to move front or back	Miscellaneous
R83	625128	6039972	Pile of ~3 metal sheets: 1.35 x .65 m, <2 mm thick; drilled around edges: 7 mm diam drill holes; irregular spaced, one drill hole with screw in it	SMA
R84	624902	6040416	Old road cutting, N/S alignment; continues north under powerline	Transport

ID	Easting	Northing	Description	Theme
R85	624700	6040451	20°/230° alignment; cut and benched up to 1 m deep, 3-3.5 m wide; seems to follow spurline down to dam	Transport
R86	624690	6040465	15m NW of R85, cut and benched up to 0.8 m deep, 2 m wide	Transport
R87	626299	6039170	Large old Eucalyptus (<i>mannifera</i>) immediate adjacent to track on NW side; 2 parallel axe cuts in burnt scar face. Given the relatively young age of axe marks could be incidental	Miscellaneous
R88	625486	6039372	River cobbles of various sizes; area: 4 x 4 m; on west side of crest facing river. Appears to be cultural made rather than natural. Function uncertain. Given its proximity to the Ravine Cemetery, the question is raised as to whether it is a European burial.	Miscellaneous
R89	626537	6038353	Small pile of stone: semi-circular form measuring 0.60 m with a loose scatter over 1 x 2 m area. Function uncertain but probably modern campfire	Miscellaneous
R90	626546	6038283	Lobbs Hole Copper Mine Located on west side of Lick Hole Creek; rotted wooden probs visible; passage 1.2m wide x 9m leading into mine opening; mound of rock and earth in passage at opening. Adit c. 3 m high. At c. 15 m in front of adit 2 metal rail tracks.	Mining
R91	626515	6038289	Mine shaft c. 13 m wide; filled in; mullock on all sides but mostly S, E & W.	Mining
R92	626513	6038227	Two parallel benches of levelled ground, one above the other. ~ 20 m long x 4 m wide. Mess and plain wire with rocks (rabbit proof fences); sparse scatter of metal 2 bricks	Pastoralism
R93	626523	6038217	Mesh and plain wire with rocks (reinforcing) extends from platforms (R92) in SE direction to 626536.6038187 in Lick Hole Gully immediately below road. Grid ref at what appears to be gate post hole 2 m apart. Each measures c. 45 cm wide x 70 cm deep oval shaped.	Pastoralism
R94	626566	6038210	The feature is what appear to be a road alignment and creek crossing (Lick Hole Gully). It appears to extend from the west side as deep wheel track. On the east side of the gully, the road alignment becomes a cutting and may be associated with the mining activity in Lick Hole Gully.	Transport

ID	Easting	Northing	Description	Theme
R95	626392	6038391	Vestigial linear feature - road. c. 4 - 4.5 m wide and cut c. 30 cm deep. Overgrown. Extends downslope SE towards mine in Lick Hole Creek. Grid ref at intersection with Flying Fox Road. Becomes indistinct at 626505.6038317	Transport
R96	626561	6038284	The open cut mine was a part of the Lobbs Hole Copper Mine. It is in Lick Hole Gully. There is a cut and level zone at base of slope adjacent to creek on west side. It measures c. 30 m long x 10 m wide. There is a cutting at base of the slope measuring 2m deep. Material evidence on the floor of the cut includes bricks, brick fragments and slag. Site of original open cut but has also been a brick manufacturing area. The site possesses no obvious features of the open cut mining venture.	Mining
R97	626590	6038331	Willow, poplar, apple along valley. Grid reference is a nominal location	Pastoralism
R98	626626	6038244	Excavated depression located on the south side of Lick Hole Gully. It measures approximately 5 m x 4 m x 1.5 m deep. It has old metal plate and debris in it. Its function is unknown.	Miscellaneous
R99	626569	6038268	This feature is interpreted to be a well, although that function is not confirmed. The feature is in the drainage depression of Lick Hole Gully. It is an excavation with wooden collar made from round (undressed) wood posts that line the hole in a rectilinear shape, measuring c. 1.8 x 0.8 m. The depth is unknown. The 'well' is in a larger depression: 6m long x 4m wide.	Miscellaneous
R100	626592	6038452	Horse drawn single furrow mould board plough.	Pastoralism
R101	625702	6039152	Site described as an old house site by a camper. Apple trees and Euphorbia, cluster of old billies, oil cans, beer and wine bottles and drink cans. No obvious evidence of building.	Miscellaneous
R102	625532	6039232	Stone culverts on either side of road	SMA
R103	626561	6038555	Cut and benched platform-oriented NW/SE. c. 20 m long x 2 m wide by up to 1 m deep. Could be associated with chicken wire fence to SW.	Pastoralism
R104	626390	6037729	10m long trench 1 m wide x 0.5 m deep aligned 30°/210°. Earth banked on downhill side; tuff pieces strewn around. Becomes curved to extend around a low narrow rise to the edge of a rock ledge in creek proper at 626404.6037779.	Miscellaneous
R105	626379	6037706	East end of a ditch that extends westward along contour for c. 20 m.	Miscellaneous

ID	Easting	Northing	Description	Theme
R106	626620	6038040	?easterly extension of old road	Struggle St
R107	626599	6038069	Level platform; 10 m long x 4 m wide aligned N/S on contour. With a scatter of tin. In same location as 'old mine buildings' as per Ravine map 1911	Struggle St
R108	626554	6038042	Deeply incised track that descend into creek channel (Lick Hole Gully)	Struggle St
R109	626523	6037987	Probably Paterick house site, platform 18 m long x 9 m wide x 1.4 m deep cutting; The wooden cross for Emily fallen on ground on house platform; extensive European vegetation including the stump of a big fig tree.	Struggle St
R110	626499	6037952	This feature is a building platform in the Struggle Street area and near the creek. It is a level platform excavated into the hillslope at a depth of c. 0.8 m. The size is unknown as it is covered with blackberry thicket. The platform is aligned E/W on a contour. A scatter of rusty tin sheet occurs on the site.	Struggle St
R111	626479	6037940	Struggle Street: path descends into creek channel (Lick Hole Gully) to R115 stone channel	Struggle St
R112	626731	6038521	Mining on east side of river and out of project area; not inspected.	Mining
R113	626477	6038196	The Yan's sheds (see 1937 photo of horse riders) in an area measuring c. 30 x 30 m with numerous cut and benched excavations. On southwest side of road.	Pastoralism
R114	626598	6038246	A deep pit with recycled steel on steel rail tracks (function uncertain)	Miscellaneous
R115	626458	6037920	Stone lined channel in Lick Hole Gully. R111 path descends to feature	Struggle St
R116	626591	6038482	Noted by (Pearson 1979). Mound of earth measuring c. 12 x 12m with cast iron bed frame, metal, brick covered in thick high grass.	Miscellaneous
R117	626667	6038456	Location of Lobbs Hole Central Mine test shaft. grid ref provisional; there is no evidence on the ground (see Pearson 1979)	Mining
R118	625668	6039652	Overgrown Ravine town cemetery. grid ref denotes entrance off the Ravine Powerline Road. The cemetery measures c. 150 x 200 m and has at least six graves (see Table 9), the precise location of which is unknown. The cemetery is overground and there are no surface indicators of graves. The Ravine Cemetery was revoked on 28 February 1986 (Government Gazette of the State of New South Wales 8 November 1985; 28 February 1986). Prior to the formalisation and gazettal of the Ravine General Cemetery site, deceased persons were designated	Ravine

ID	Easting	Northing	Description	Theme
			as being buried simply at <i>Lobs Hole</i> (Wilkinson <i>et al</i> 1999). Referring to the gazetted Ravine Cemetery, Wilkinson <i>et al.</i> (1999) state: 'From the number of burials prior to 1910 it would seem there was an established unofficial cemetery on the site for many years'. However, most people at Lobs Hole lived and worked well away from the Ravine Cemetery area, at the south end of the valley in and around Struggle Street and near to the mines. There could be earlier graves in the gazetted Ravine cemetery, but there is no good reason for there to be. It is much more likely that people were buried closer to where they lived and worked. The exact locations of the <i>Lobs Hole</i> grave sites are now not known, and it has to be recognised that they could be anywhere in the Lobs Hole valley.	
R119	626503	6038615	Active weather station	SMA
R120	626676	6037857	Building platform with short (2 m long) alignment of stone on one edge. The feature is on a prominent knoll at the top of Struggle Street. All features are vestigial. The feature is slightly level but there is no obvious cut and fill. The alignment of a single course of cobbles is on the north side.	Struggle St
R121	626009	6038927	Amorphous depression measuring 1.2 m x 0.8 m. Function unknown.	Ravine
R122	626004	6038907	Slightly raised stone and earth platform, possibly a hearth. It measures 1.2 by 3.5 m. Two bricks are visible.	Ravine
R128	626099	6038011	Site not found; grid ref. nominal	Ravine
R129	625940	6039740	Remnant fence line; located on the side of a gently sloping spur crest, above a creek line. Standing post at 6259406039740 [105 x 16 x 6 cm] burnt, residual condition; hardwood billet split; drilled. Minimum 4 strand plain gauge wire; no top wire apparent. Fallen posts both sides of above on alignment 290°/110° at c. 3 metre spacing; visible extent approximately 625922.6039758 [post holes] to 625960.6039729 [wire upslope]; posts are mostly fragmentary and burnt. Note fallen post and wire apparent upslope at 626039.6039678. Site condition is vestigial, but still indicative of alignment/boundary. There is no potential for associated relics.	Pastoralism
R130	625647	6039674	Borrow Pit; Mechanically excavated at edge of current track. Material stockpiled at end of pit next to road [35 m x 17 m x c. 2 m deep max.] Regrowth [mature	Miscellaneous

ID	Easting	Northing	Description	Theme
			banksia shrubs and heath] across surfaces. There is no potential for associated relics.	
R131	626357	6038275	Excavated area; located upslope of Lobs Hole/Mine Trail intersections; machine dug area at lower crest setting – directly upslope from road [22 m x 7 m x 1.7 m deep max.]. Surface has been cut/dozed with push at downslope end. Eucalyptus regrowth surface, max. diameter 25 cm, Site does not appear to be very old.	Miscellaneous
R132	626117	6038128	Old track and ?dumped sections of half pipes made from corrugated iron. Old track extends in rough N-S orientation downslope to 626151.6038185. approximately 3m wide, possible shallow cut, continues south upslope towards powerline structure #52. Half pipes measuring 63 cm long x 35 cm wide, 8 in total; 7 x stacked together and embedded in surface and 1 lying apart; no apparent purpose, structure. Lying c. downslope [west] from old track at 626119.6038130. There is no potential for associated relics.	Miscellaneous
R133	626384	6038232	Building platform located mid-lower slope, west side of Lick Hole Gully. Cut earth a on hill slope [crest side], 4 m x 2.5 m with 1.2 m upslope cut. Mature old Eucalypts growing on cut surfaces. ENE aspect. No hearth stones evident – storage for settle on flat below? Butchers shop c. 40 metres below at 626418. 6038253 [cut platforms with central brick/stone structure, adjacent to road.	Miscellaneous
RSU39/H1	624521	6041907	Old track	Transport
RSU39/H2	624467	6041753	Old track	Transport

7.2.3 Marica

The field survey at Marica was conducted in October 2017, March 2018, October 2018 and January 2019. The Marica survey area has been subject to a reasonably comprehensive field survey. The Marica survey area includes an area between the highway (in the east) and the escarpment (in the west), in addition to the ridges which descend westward from the Great Dividing Range to Lobs Hole.

In all Survey Units vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area between the highway and the Great Dividing Range is a mix of open grassland and snow gum woodland.

The area west of the Great Dividing Range is forested, and undergrowth was found to be often thick and sometimes impenetrable, especially in gully contexts. Ground surfaces are generally covered in fallen timber and thick leaf and bark litter.

The historic items previously recorded in the Marica area are listed in Table 16. There are no items of State or local significance in the survey area. The potential historic items recorded in the Marica during the field surveys are listed in Table 17.



Plate 17 Marica: Marica trig; metal element.

Table 16 Marica: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
141	1779		632713	6038684	Irwin's Hut Ruin	There is no description available for this item. This site was not relocated during the fieldwork. The only reference found for this site describes it as built in 1890s as a horse shed (KHA 1993). This reference indicates that the nature of the shed and whether or not it exists is unknown.	Miscellaneous
	1772		633613	6038284	Marica Trig (Plate 17)	The wood and metal trig is on a quartz outcrop (weathered) on the south side of the Marica Track. The trig has been burnt and is partially destroyed. It originally had four wooden posts (4 x 3's), two of which are remaining upright. The corrugated iron marker is on the ground. A survey mark is embedded in the quartz bed rock.	SMA

Table 17 Marica: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
MSU1/H1 (Plate 18)	635054	6037295	Water race. Located mid slope. Earth ditch and bank c. 1.4 m wide, c. 30 -40 cm deep, roughly trending N/S and draining to the north. 'U' shaped earth ditch with spoil on downslope easterly margin. Well preserved in areas with damaged sections. Heavily overgrown by vegetation.	Mining
MSU1/H2	635238	6037338	Water race. Located on opposite slope to SU1/H1 and appears to be on a similar contour line. Shallow 'U' shaped earth ditch and bank c. 1.6 m wide, c. 30 cm deep. Race trending 150°/330°. Spoil on downslope westerly margin. Site condition is quite poor.	Mining
MSU1/H3	635532	6037447	Fence post; located in a drainage line; hardwood split post; 'v' notched and 2 drill holes. Two barbed wires - one located in 'v' notch on top of post and other barb threaded through top of two drilled holes; [95 x 21 x 11 cm]; standing post; located	Pastoralism

ID	Easting	Northing	Description	Theme
			directly below road works bund and adjacent to highway culvert. No other fence posts observed. Post in good condition.	
MSU1/H4	635581	6037481	Water race; located c. 100 m east of the Snowy Mountains Highway; trending E-W; 'V' shaped ditch; c. 1.0 m wide x 0.20 m deep; spoil on southern downslope margin; race conjoins a minor drainage line and at this point a cluster of local rock noted within race - ?lock gate at 635606. 6037480. GPS point taken along race: 635550.6037481.	Mining
MSU1/H5	635597	6037642	Water race; 'U' shaped earth ditch; 1.5 m wide x 0.2 m deep; trending E-W; heavily overgrown with vegetation and fallen trees. GPS point taken at end of visible race: 635575.6037648. A linear mound; c. 40 m long x 4.5 m wide; purpose unclear.	Mining
MSU1/H6	635592	6037676	Remnant fencing wires and rock mound; located on a SW facing simple slope c. 50 m east of Snowy Mountains Highway. Large 'L' shaped mound, short length c. 4 m long and longer length c. 8 m and 1.5 m high (max.). Mound comprised of loose sorted rocks. Definitely a man-made mound and not naturally occurring however purpose is unclear. Directly adjacent to part of mound is an assortment of wires; barbed, plain and sheep netting embedded in ground. Three strands of twisted and looped wire, possibly for round post attachment purposes; no posts observed.	Pastoralism
MSU4/H1 (Plate 19)	633726	6038022	Old fence line; c. 3 m east of Wallaces Creek Fire Trail Three split posts, all fire damaged and in poor condition. No fence line orientation was noted. Post 1 at 633729.6038036; [110 x 9 x 10 cm]. Post 2 at 633729.6038034 [60 x 6 x 7cm] Post 3 at 633726.6038022; fallen.	Pastoralism
MSU8/H1	635328	6037364	Remnant fence line, aligned N-S, located on a crest landform. Post at 635328. 6037364; [130 x 14 x 11 cm] poor condition; fallen; one heavy gauge plain wire. Post at 635312. 6037291 [140 x 18 x 10 cm] fallen; directly adjacent to remnant post hole; some heavy gauge plain wire with tied ends.	Pastoralism



Plate 18 Marica: MSU1/H1 water race looking 220°.



Plate 19 Marica: MSU4/H1 stock fence looking 20°.

7.2.4 Gooandra Hill

The field survey at Gooandra Hill was conducted in March 2018, October 2018 and January 2019. The Gooandra Hill survey area has been subject to a reasonably comprehensive field survey.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland.

The historic item previously recorded in the Gooandra Hill area is listed in Table 18. There are no historical items of State or local significance in the survey area. The potential historic items recorded at Gooandra Hill during the field surveys are listed in Table 19.

Table 18 Gooandra Hill: Previously listed historic items.

KHA id.	OEI id.	s170	Easting	Northing	Name	Description	Theme
240			636130	6038546	DMR (Department of Main Roads) Roadman's Hut	According to KHA listing: <i>DMR Roadmans Hut c1940-80</i> <i>Alternative - (Snowy Mts Hwy Gooandra Hill)</i> <i>Current site - Building ruin/site</i> <i>Description - Site of road workers hut sawn timber weatherboards 9 x 6m. Defined by stone fireplace 1.5m high, visible from highway.</i> See below - GHSU1/H4	Transport

Table 19 Gooandra Hill: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
GHSU1/H1 (Plate 20)	636055	6038015	The Gooandra Trig. A stone pile with wooden post and a metal vane in relatively good order.	SMA
GHSU1/H2	636415	6038009	Costean, 4 m long x 2.5 m wide with mullock on north side (downhill). A shallow depression 8 m to the north east of costean.	Mining
GHSU1/H3	637130	6037551	A depression measuring 3 L x 3 W x 1 m D with a pile soil measuring 5 x 4m to south. Could be a dug out spring.	Pastoralism
GHSU1/H4 (Plate 21)	636130	6038546	DMR Roadmen's Hut c. 1940-1980. Stone fireplace; largely intact; constructed from basalt columnar slabs [almost certainly sourced from Gooandra Hill] some of which area partially modified but majority of slabs are unmodified [dressing modification apparent by a much fresher surface on basalt]. Better basalt slabs form foundation courses and quoins followed by rubble – roughly coursed rock used for remainder of fireplace. Platform on northeast [30°] side has good subsurface potential i.e. deposit present; however, a very irregular surface suggests possible disturbance to the deposit. Mound to the northwest of platform. Unclear of hut dimensions as no other structural evidence obvious. Hut site area associated with various features likely to be related to	Transport

ID	Easting	Northing	Description	Theme
			stockpiles. Remnant access track possible parking/stockpile area, more level and partially cut into slope at 636174.6038522.	
GHSU7/H1	635706	6037264	Race. Beneath overhead powerline. Water race c. 2 m wide x 40 cm deep. Well cut into slope with clear but subtle mounding along downslope side. 'Contours' at roughly 250/70° with curve across crest (spur top and sides). Runs through SU7 into adjoining terrain. On spur toe overlooking low-lying drainage depression to south. Site condition is fair.	Mining
GHSU12/L1	635213	6036352	Sign. Located under powerline/edge of powerline approximately 40 m east of Highway. Electricity Commission of NSW sign. Two wooden posts 2.4 m high x 7 cm x 7 cm (square) set 1.25 m apart, with steel plate sign [1.38 m x 47 cm]. Nail holes in corners indicated originally fastened to posts. Heavily rusted. Appears to have been painted yellow with stencilled black capital letters [now faded and residual] 'ELECTRICITY COMMISSION OF NSW ...LONG PLAIN'. Most writing is faded and largely illegible. Plate sign lying at base of posts.	Miscellaneous
GHSU13/H1	635193	6036283	Structural remains. Located east side of Highway, c. 16 m from edge of road. Concrete aggregate foundations with stone coursing on base. Remnants are sitting in large excavated ditch or depression. Three large blocks with embedded stone measuring 220 cm x 90 cm, 170 cm x 90 cm, 230 cm x 50 cm. A further 14 blocks located nearby. Site measures 13 m x 2.5 m and is aligned parallel to existing Highway. The area is highly disturbed and site condition is poor.	Miscellaneous



Plate 20 Gooandra Hill: GHSU1/H1 Gooandra Trig; looking 240°.



Plate 21 Gooandra Hill: GHSU1/H4 Stone hearth at the DMR Roadman's hut; looking south.

7.2.5 Wallaces Creek Fire Trail

The field survey at Wallaces Creek Fire Trail was conducted in March 2018 and January 2019. The Wallaces Creek Fire Trail survey area has been subject to a reasonably comprehensive field survey. This survey extended from the highway west to Wallaces Creek Fire Trail and hence, northward along the fire trail to Marica.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland. Ground exposures were generally negligible.

There are no historic items previously recorded in the Wallaces Creek Fire Trail area. The potential historic items recorded at Wallaces Creek Fire Trail during the field surveys are listed in Table 20. These relate to the themes of pastoralism and mining. A large building platform and nearby telegraph pole are likely to be associated with the walking/bridle track between Kiandra and Lobs Hole.

The Wallaces Creek Fire Trail survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 20 Wallaces Creek Fire Trail: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
WSU9/H1	633743	6035527	Water race. Earth ditch and bank c. 2 m wide from cut to mound edge, c. 40 cm deep, roughly trending NW/SE. To the SE end a curve in the race to the SW. Well preserved. Grid reference points taken along race: 633731.6035557; 633694.6035580; 633617.6035663; 633534.6035689; 633495.6035681.	Mining
WSU9/H2	633528	6035629	Water race roughly trending E/W 40-50 m upslope for SU9/L1. Smaller width and depth than SU9/L1. Well preserved. Grid reference point taken along race: 633485.6035635.	Mining
WSU9/H3	633568	6035500	Water race. Earth ditch and bank c. 1.5 m wide, c 40 cm deep., roughly trending NW/SE. Well preserved in areas with damaged sections. Grid reference points taken along race: 633576.6035464 – curve 633600.6035419.	Mining
WSU9/H4	633678	6035398	Water race. Earth ditch and bank c. 1.5 m wide, c. 40 cm deep., roughly trending NW/SE. Poor condition. Grid reference points taken along race: 633710.6035372; 633728.6035349; 633750.6035315, 633855.6035269. Race continues around the break of slope of the crest contour in a SSE direction.	Mining
WSU9/H5	633730	6035218	Water race. Earth ditch and bank c. 1.5 m wide, c .40 cm deep; follows along break of slope of upper crest; trending N-S.	Mining
WSU9/H6	633286	6035132	Costean measuring 2.2 m long x 1 m wide x 0.6 m deep. Rectangular form NE/SW. Another possible one similar dimension but not well defined, situated 5 m downslope to the WNW.	Mining
WSU9/H7	633269	6035098	Costeans: Trench measuring 7 m long x 1 m wide x 0.7 m deep with mound on NE edge. Pit: c.11 m downslope measuring 4 m long x 2.5 m wide x 1 m deep with mound on N edge. Pit: c. 2 m downslope obscured by blackberries. Trench/pit measuring 3 m long x 0.9 m wide x 0.75 m deep with mound on NE edge.	Mining
WSU9/H8	633228	6035108	Water race. Earth ditch and bank c. 1.2 m wide x c. 0.5 m deep., roughly trending NE/SW.	Mining
WSU9/H9	633235	6035161	Water race and possible modified drainage line. Drainage line roughly trending NW/SE; c. 5.5 m wide x c. 1.3 m deep, some erosion present; mounding fringing	Mining

ID	Easting	Northing	Description	Theme
			channel [earth and small basalt boulders]; possibly worked or scoured; race crosses based of slope and appears to be cut by drainage line.	
WSU9/H10	632987	6035039	Water race; possibly part of previously recorded race; located on a north facing mid to lower slope. Race curves to follow contour. Grid reference points taken along race: 633061.6035063; 633095.6035076; 633140.6035091 Site condition ranging from good to poor. Apple tree close by at 633174.6035135, c. 10 - 20 years old.	Mining
WSU9/H11	633282	6035263	Race and ?diggings; located at the low point of the crest; race an earth ditch; majority of ditch soil mounded on northern bank; race trending generally E-W. Race located on a level part of crest; crest extends higher to the south possibly providing water runoff to race as well. Diggings area is directly adjacent to race; area c. 2 x 3 m with large quartz boulders extracted and now laying on spoil pile to the west of pit and more on the northside of race bank opposite pit. Site condition is poor.	Mining
WSU11/H1	633336	6035530	Mining – modified waterway. Substantially modified waterway; possible habitation/mining. Tailings mounds visible in valley below. SU11/H1 race extends onto crest landform of SU9.	Mining
WSU12/H1	633212	6035693	Mining complex appears to extend from SU11 into SU12. Mining and tailings mounds; visible piles extend from a minimum grid reference 633184.6035644 to 633229.6035724. Tailings mound extends SE in a linear form. Possible modified drainage line or artificial drainage line on SE bank of watercourse and extends up onto crest at 633130.6035539. Site is extensive – dams, tailings mounds and paddocking continue up stream. Race at 633002.6035355; not very well defined; runs adjacent to a drainage line and oriented 245°/65°. Possible hut site at 632983.6035344; [hearth rocks, dirt walls raised above an area c.5m x 5m]. Dirt mound c. 3 m SW from above at 632987.6035340. unclear of function, rabbit diggings in vicinity of dirt mound. Mine complex continues SE bank, confluence at main creek and SU11 modified drainage line at NW end at 633205.6035685. The following recordings were in SU14 however it is a continuation of SU12/H1 mining site complex. Tailings mounds on both sides of drainage line and links up with	Mining

ID	Easting	Northing	Description	Theme
			SU11/H1 mine site to the SE. Race at 633235.6035625 confluence with drainage line near tailings mound. Race continues 240° along slope contour. Modified drainage line that connects to SU11/H1 at 633332.6035526; entire extent of drainage line appears to be modified and/or worked. Race at 633197.6035538; trending 45°/225° and contours around slope. Scatter of large rocks/boulders within drainage line - ?lock gate at 633167.6035505; associated race on break of slope of crest with a westerly aspect. Race at 633139.6035493 on south side of drainage line and lock gate at 633097.6035444. End point of race where it meets major creek channel at 633079.6035435. Area well worked. Race at 633095.6035395. Trends 30°/210°. Not well preserved. Mine works appear to extend much further to the east and marry to scoured drainage line in SU9 workings.	
WSU12/H2	633177	6035584	Race; earth ditch; 1.1 m wide x .0.30 m deep; trending runs along mid slope contour of a low rise. Not well preserved.	Mining
WSU13/H1	632979	6035128	Race; shallow earth ditch but well defined; 1.2 m side x 0.25 m deep. Trending NW-SE; follows contour; race begins at a spring head at 632951.6035434. Grid reference point taken along race: 632974.6035387.	Mining
WSU13/H2	632909	6035339	Hut remains (possibly Mrs Hughes Inn c. 1860) and collapsed stone chimney located c. 100 m from creek on a very gently sloping bench in a low elevated spur crest. Hut platform c. 4 m EW x 8 m NS. Hearth at northern end measuring 1.2 m NS x 2.5 m EW. Evidence of wooden post hole in SW corner and NE corner. Chimney stones in pile but still together; integrity appears very good. Rusty sheet tin scattered around site; pieces of heavy gauge plain wire [loose and embedded], fragments of glass, shards of thick white ceramic and other ceramics also observed nearby. 4 x pieces ceramic at 632916.6035326; 4 x pieces ceramic at 632919.6035327; 1 x piece ceramic; 2 x green glass fragments at 632923.6035357; 1 x patterned ceramic; 2 x green glass fragments, 1 x plain wire twisted c. 20 cm long at 632916.6035362; Fence remnant and numerous pieces of embedded wire at 632901.6035379; 1 x ceramic shard at 632919.6035395. SU13/L2 located directly adjacent to hut site.	Miscellaneous

ID	Easting	Northing	Description	Theme
WSU13/H3	633112	6035587	Dirt mound; function unclear; located on toe slope of a spur crest of low elevation, very gently sloping to the east. Line of closely placed quartz cobbles with apparent accumulation near north end of line [may be natural or cultural] nearby at 6033205.6035774. Site is located directly adjacent and above creek line. Vegetation is heath and grassland. Rabbit diggings/warren surrounding mound and a wombat burrow at SE end. No other items located.	Miscellaneous
WSU14/H1	633066	6035236	Old telegraph post (between Kiandra to Lobs Hole), peg and insulator located on lower slope of spur crest with a very gentle gradient sloping to the WNW. Site adjacent to main creek line. Visibility very low, artefacts were exposed in cleared grass area. A hole located 1 m SE of fallen telegraph post [old post hole]. Post laying 260°/80°; appears insulator and peg are not in original position as the grass is only just yellowing underneath. Post rotted; white ceramic insulator chipped but overall still in very good condition as is the wooden peg holding the insulator.	Miscellaneous
WSU16/H1	632925	6036083	Old fence line; located on major ridge, west and mainly east of Wallaces Creek Fire Trail on crest proper. Majority of posts recorded in SU16/H1 are of a regular shape and size with no drill holes unless stated otherwise. Occasional half split post used. However, all posts have 'v' shaped notching on top and/or side of post on eastern face [most likely a means to securely attach a wire]. Most posts are c. 3.5 m apart. Fence line at 632925. 6036083 trending 10°/190°. Alignment does change direction along fence line as stated below. Split posts; heavy gauge plain wire; old style sheep netting and an occasional barb wire observed. Post 1: at 632925.6036083. Post 2: at 632919.6036067; 3 heavy gauge plain wires; no drill holes or wire attachments noted; post 2 c. 4m north of post 1. Post at 632874.6035976; standing. Post at 632850.6035935; standing. Post at 632849.6035932; fallen; has 2 plain wires. Fence line continues to the south. Post at 632847.6035930; remnant. Post at 632843.6035922; has 1 plain wire and possibly sheep netting – very overgrown and hard to determine. Twisted wire and plain wire embedded in ground at 632826.6035882. Fence crosses Fire Trail onto west side of road and trends 10°/190° with four standing posts – split with one strand barb tied onto one post. Posts continue east side of Fire Trail aligned	Pastoralism

ID	Easting	Northing	Description	Theme
			10°/190° at 632958.6036146 through to 633539.6037309. Along this section of fence are five quartz cobbles at base of fence line, a linear feature trending 10°/190°; rabbit proofing or sheep/animal deterrent to stop pushing under fence. Crest where quartz feature is situated is highly eroded with numerous areas of shale outcropping exposed. Quartz cobbles continue at 632986.6036203 and appears to end at 633000.6036231. Fence alignment continues as 10°/190° at 633159.6036582. Line of fence posts on east side of Fire Trail; standing with plain wires held in top notches; all fire damaged; fence line continues a 10°/190° alignment at 633307.6036897. Some posts have barb wire held in top notch and some have plain wires and usually with remnant sheep netting running along fence line. Line of posts continue west side of Fire Trail in a 170°/350° alignment and continue onto east side of trail at 632745. 6035511 in same alignment 170°/350°; posts have signs of fire damage and are in poor condition but mostly standing positions. Post at 632745.6035511. Post at 632747.6035447. Post at 632741.6035388; same type of posts and design continue. Small amount of rolled barb and plain wire at 632733.6035250. Fence continues upslope in a 170°/350° alignment. Post at 632732.6035226 has two drill holes with 2 plain wires and 1 barb; post fallen; half split post. Round post with 4 plain wires and 1 barb; post fallen directly adjacent to remaining post hole at 632717. 6035087. Same style of post and design as at northern end of fence line – 1 plain wire at top and top ‘v’ notching on east margin. Occasional remnant sheep netting, 3 x plain wires and 1 x barb wire evident along this section of fence. Drum with wire handle at 632719.6035054, some rust holes.	
WSU16/H2	632706	6035134	Remnant stockyards; located on very gently undulating ridge crest. The remains of a rectangle stock yard; c. 21.5 – 23 m NS x 12 – 14 m EW. Yards set up using posts with different design features as well as an assortment of netting and wire types – yards possibly undergone maintenance or construction re-using existing materials available at hand. This feature is associated with SU16/H1 fence line. NW corner post [144 x 16 x 10 cm] at 632706. 6035134; plain and old-style ring-lock – ‘v’ notch on top of post and 2 plain wires. NE corner post [124 x 14 x 8 cm]	Pastoralism

ID	Easting	Northing	Description	Theme
			<p>at 632727.6035135; split post; top 'v' notch, 4 notches on side and 1 drilled hole; most likely part of fence line recorded in SU16/H1 incorporated into yard set up. Post north end of yard at 632722.6035133; split; [117 x 22 x 9cm] top and bottom plain wires, sheep netting and side and top notches, 3 drill hole – c. 28 cm spacing. Post at 632731.6035127; fallen; [122 x 18 x 10cm]; Post at 632727.6035123; fallen; 'v' notch in top; 3 side notches [132 x 18 x 14cm]. Post at 632718.6035116; fallen; [134 x 23 x 12 cm]. Post at 632719.6035109; [126 x 23 x 11cm]; 'v' notch; at least 5 drill/bore holes at c. 28 cm spacing; 2 top plain wires and sheep netting. Post at 632724.6035108; split post; 'v' notch [120 x 17 x 10cm]; 5 drilled holes all on east side of post; 2 top plain wires and sheep netting. Post SE corner at 632728.6035098. Post at 632723.6035100; split post [118 x 20 x 11.5 cm]; 2 top plain wires; possible 'v' notch on top of post; 3 drill holes on south margin; and ringlock. Post at 632716.6035102; split; [108 x 19 x 9 cm]; 'v' notch on top; 4 drill holes on southern margin; 2 plain wires at top and 1 plain wire running along ground with ringlock fencing; all wires attached to the southern side of post. Post at 632708.6035111; fallen; [115 x 21 x 10cm]; ringlock; plain wire and 2 notches. All yard posts are fire damaged. Loose wire and rusted metal bucket with handle at 632711.6035116. metal drum at 632723.6035101; 4 gallons; 33 cm high x 29 cm diameter; wire handle and small screw top lid; located adjacent to yards.</p>	
WSU16/H3	632745	6035065	<p>Hearth - located near level shoulder on ridge top with a northerly aspect and south of fence and yards; country stone (metamorphic) stone construct exhibiting features consistent with a hearth [dimensions, setting on level surface, etc.] orientation N-S along long axis; 2 m x 1.1 m, very straight rear edge/wall; distinct terminations and corners. Impression is of a stone construct at end of an E-W trending level or platform surface. Area now overgrown by snow gums and grasses. 15 m to SW is sheet of corrugated iron [folded sheet] largely obscured by vegetation cover at 632735.6035062. Some potential of dwelling/occupation site. Zero visibility in area due to vegetation. Site appears to be intact as a basal cultural feature. Immediate deposit is likely to contain evidence of structure [eg. post holes]</p>	Miscellaneous

ID	Easting	Northing	Description	Theme
WSU16/H4	632757	6035122	?Race/trench – linear ‘v’ shaped earth ditch; 75 cm wide x 30 cm deep; located south of stockyards; race continues to the NNE ceasing downslope of crest; southern end of race/trench ceases at Wallaces Creek Fire Trail then continues on western side of road for a further c. 10 m until completely obscured by thick vegetation.	Miscellaneous
WSU16/H5	632720	6035083	Loose corrugated iron sheets; 5 rusted sheets of corrugated iron scattered across ground surface and in undergrowth; function unclear; fallen gate post 7 m to the north of iron sheets.	Miscellaneous
WSU16/H6	632680	6035096	44-gallon metal drum located on western side of Fire Trail and SW of yards; moveable object - most likely not in original position; ribbed; has base but no lid; rusted with holes; 58 cm diameter; base stamped with RHEEM B 18 55 40.	Miscellaneous

7.2.6 Kings Cross Road

The field survey at Kings Cross Road was conducted in November 2018. The Kings Cross Road survey area has been subject to a reasonably comprehensive field survey. This survey extended from the southwest end of Kings Cross Road to its intersection with Link Road near Mt Selwyn.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland. Ground exposures were generally negligible. Certain areas were found to be highly disturbed by previous works particularly associated with the construction of the original Snowy Mountains Scheme. Frequently, landforms were highly modified by gross earth works such that the original potential artefact bearing soils very removed.

The historic items previously recorded in the Kings Cross Road area are listed in Table 21. There are no historical items of State significance in the survey area. However, four SMA sites are of local significance (s170). The potential historic items recorded during the field surveys are listed in Table 22.

Table 21 Kings Cross Road: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
4623		10677	628940	6022910	Quarry	According to KHA listing: <i>QUARRY; alternatively known as Kings Cross Quarry/Gravel Pit #1</i> See below - KCSU7/H5	SMA
4624		10678	629075	6022865	Quarry	According to KHA listing: <i>quarry; alternatively known as Kings Cross #2; Quarry/gravel pit.</i> See below - KCSU7/H6	SMA
		9801	629113	6022934	Kings Cross camp	Kings Cross camp See below - KCSU7/H7	SMA
		10679	629263	6022934	Kings Cross quarry #3	Kings Cross quarry #3 See below - KCSU7/H4	SMA

Table 22 Kings Cross Road: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
KCSU2/H1	626178	6023141	Old fence line located on a simple slope with a north-easterly aspect. Fence posts of various alignments. Post 1: 180 x 3 cm; triangular; Post 2: fallen post c. 21 cm with wire – 6 x strands; 1 x 'Iowa' barbed wire. Post 3: post in alignment of 170° running south across flat. Eleven posts in line, most outside impacts. First three posts to north inside impact area. There is no potential for associated relics.	Pastoralism
KCSU5/H1	626959	6023205	Old fence line west of road. Two posts; 4 m apart; running 84° post to post; posts are 28 cm diameter; 6 wires. Observed just outside SU: Two poles. Pole 1: at 626641.6023021 – 25 cm x 4 m long; galvanised washer and bolt. Pole 2: at 626600.6023016 remnant of 'T' section.	Pastoralism
KCSU7/H1	627815	6022395	Fence post x 1; burnt; with wire. Very poor condition.	Pastoralism

ID	Easting	Northing	Description	Theme
KCSU7/H2	629156	6022913	Fence post; possibly a corner post; located at bend in Kings Cross Road on ENE side and opposite Tumut Ponds turnoff. Post 115 cm high; wire; burnt. There is no potential for associated relics.	Pastoralism
KCSU7/H3	629498	6023140	Concrete post support; A pile of concrete made with rough aggregate; volcano like shape with centre hole for a wooden post; circular pole 23 x 23 cm. 570 [high] x 90 x 90 cm. pole hole not straight; made after road construction; very expedient construction. There is no potential for associated relics.	Miscellaneous
KCSU7/H4	629263	6022934	KHA #3 Quarry; unrecorded; adjacent to Kings Cross Road; Shale quarry c. 25 x 25 m and 3 m deep. Small quarry abutting road.	SMA
KCSU7/H5 (Plate 23)	628940	6022910	This feature is a shale quarry located on the southern side of Kings Cross Road and c. 230 m to the west of the junction of that road and Tumut Ponds Trail. The quarry measures c. 40 m in length and is cut in from the road a distance of c. 30 m. Material has been excavated to a depth of c. 6 m at its deepest point and the rear wall of the quarry has been left steeply sloping and irregular. Similarly, areas on the floor of the quarry have been left uneven, with low mounds of rock present. The quarry is relatively undisturbed.	SMA
KCSU7/H6 (Plate 24)	629075	6022865	This feature is a shale quarry located on the southern side of Kings Cross Road and immediately to the west of the junction of that road and Tumut Ponds Trail. The excavated area measures c. 100 m in length and is quarried to a distance of c. 40 m back from the road. Stone has been removed to a depth of c. 8 m at its deepest point along the rear wall, which has been left very steeply inclined. The base of this former quarry appears to have been relatively flat, but now contains significant piles of dumped/stored material including bitumen, rock and felled tree trunks.	SMA
KCSU7/H7	629113	6022934	Kings Cross SMA camp; no remains or relics visible.	SMA



Plate 22 Kings Cross Road: KCSU7/H5 SMA stone quarry; looking 300°.



Plate 23 Kings Cross Road: KCSU7/H6 SMA stone quarry; looking 210°.

7.2.7 Link Road

The field survey at Link Road was conducted in November and December 2018. The Link Road survey area has been subject to a reasonably comprehensive field survey. This survey extended from the intersection with Kings Cross Road north to the intersection with the Snowy Mountains Highway at Kiandra.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland. Ground exposures were generally negligible.

The historic items previously recorded in the Link Road area are listed in Table 23. There are no historical items of State or local significance in the survey area. The potential historic items recorded at Link Road during the field surveys are listed in Table 24.

Table 23 Link Road: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
5260			634890	6029597	Foot Bridge	According to KHA listing – <i>Foot Bridge (Bullocks Head Creek, Kiandra); built in 1890s; site of timber foot bridge, possible 25m upstream of 20th century concrete road bridge. A ford just west of the bridge provided a vehicle crossing over the creek.</i> See below - NC23	Transport

Table 24 Link Road: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
LSU3/H1	632697	6028367	Modified mining landscape; located on upper side of Link Road on a simple slope of moderate gradient with a southerly aspect. Hillocks and eroded areas. Site condition is degrading from erosion. There is slight potential for associated relics. There is very limited potential for subsurface material.	Mining
LSU4/H1	633192	6029071	Old road and culvert; drainage ditch. Old road. Section does not underlie present road, elbow with culvert at bend. Road is 'paved' with medium sized grey [granitic]cobbles laid in random fashion. Edge of road is raised, and drainage ditches lie on either side. Road looks as though it could be of some age but pipe in culvert is reinforced concrete and reasonably thin walled. Drainage ditch at southern end continues and follows present road. There is slight potential for associated relics.	Transport
LSU5/H1	634122	6029437	Old fence. East-west orientation (270/90 degrees) and extends between creek flat at 634239. 6029407 and towards The Link Road at 633964. 6029465. Eastern extent connects with N-S trending fence that crosses Bullocks Head Creek and becomes obliterated by sand mining in the creek valley. From point 634239. 6029407 to 634119. 6029436 the fence is mostly vestigial and is composed of fragmentary fallen hardwood posts with collapsed wire. Westwards, from 634119. 6029436 to 633964. 6029465 the fence is comprised of mostly standing split hardwood posts c. 110 cm high x 20 cm wide x 9 cm thick with five strands plain wire. The posts have been drilled for wires and	Pastoralism

ID	Easting	Northing	Description	Theme
			exhibit a spacing of 5 - 6 metres. Interval wire has been rigged for droppers at 2 m intervals.	
LSU5/H2	634134	6029479	Culvert; concrete pipe under road; local stone head wall on either side using a concrete mortar. Site condition is reasonable. There is slight potential for associated relics.	Transport
NC1	634142	6029490	Track. NNE/SSW trending (20/200 degrees) vehicle/access track connecting upslope goldfield workings with Link Road. The track is c. 4 m wide and appears to be comparatively altered/enhanced by more recent culvert construction and surfacing with imported gravel. It is flanked on the NW side by a culvert and mounded excavated material.	Transport
NC3	634166	6029492	Track. A 10/190 degrees trending linear feature running uphill and connecting general gold workings with The Link Road. The feature parallels the lower end of the track at NC1 with a spacing of c. 10 m. The track is c. 3m wide with an earth graded surface devoid of fill or gravel. It is cut into the landscape surface and not elevated with flanking pushed material at downslope end. The track runs upslope for c. 50 m before being truncated by NC1.	Transport
NC4	634166	6029514	Path/track. A linear feature c. 30 m long x 1.5 – 2 m wide and roughly contouring along alignment of 80/260 degrees. Upslope cut is c. 30 cm deep with a well-defined downslope bund. The path has been truncated by the tracks NC3 and NC2 and appears to have been impacted by soil conservation works at the eastern end.	Transport
NC5	634285	6029524	Post/pole. Base of a hardwood post 25 cm diameter and 24 cm high, burnt. Appears to be one of a series of poles noted along the Link Road.	Miscellaneous
NC6	634329	6029531	Post/pole. Base of hardwood post 25 cm diameter and 15 cm high, burnt.	Miscellaneous
NC7	634373	6029540	Post/pole. Base of hardwood post 24 cm diameter and 37 cm high. Star post inserted on SW side.	Miscellaneous
NC8	634369	6029535	Track. Remnant shallow graded track c. 2.5 m wide and 60 m long. Exhibits wheel ruts with a raise centreline. Orientation is 80/260 degrees. The eastern extent has been impacted by landscape rehabilitation works.	Transport
NC9	634377	6029547	Tailings mounds. Remnant earlier phase gold mining tailings mounds on lower/basal slope between extensive soil conservation works and a current picnic area within the rehabilitation zone. They include the following features: at 634377. 6029547 a large	Mining

ID	Easting	Northing	Description	Theme
			linear mound of basalt cobbles and small boulders oriented SSE/NNW and c. 20 m long x 5 m wide x 1.5 m high – traces eastern edge of drainage line, heavily impacted/ truncated by soil conservation works at upslope end. Appears to be a downslope continuation of similar mounded feature further upslope; at 634335. 6029547 a mound of gravel and cobbles c. 4 m x 3 m x 1.5 m high, potential remnant/reworked tailings; at 634363. 6029531 a mound of sand, gravel and cobbles at the edge of a drainage line, possible reworked/remnant/obscured tailings mounds; at 634402. 6029548 mounding and channelling of gravels and cobbles, possibly remnant smaller scale workings on lower slope, including and along an artificial channel between 634399. 6029543 and 634409. 6029566; at 634418. 6029548 reworked, possible remnant tailings mounds c. 30 m x 10 m, partially incorporated into soil conservation and rehabilitation works.	
NC10	634418	6029549	Post/pole. Base of hardwood post 25 cm diameter, burnt off at ground level. Set into remnant tailings/workings.	Miscellaneous
NC11	634469	6029559	Post/pole. Base of hardwood post, damaged and reduced in size, 15 cm diameter x 25 cm high. Set in ripped/rehabilitated area.	Miscellaneous
NC12	634506	6029563	Post/pole. Base of hardwood post 25 cm diameter x 7 cm high, burnt and damaged. Set in rehabilitation area.	Miscellaneous
NC13	634577	6029579	Post/pole. Base of hardwood post 25 cm diameter x 30 cm high, burnt. On mounded area next to culvert/rehabilitation zone.	Miscellaneous
NC14	634618	6029587	Post/pole. Base of hardwood post 25 cm diameter x 45 cm high with star post driven in adjacent. Set in remnant surface within rehabilitation zone.	Miscellaneous
NC15	634662	6029595	Post/pole. Base of hardwood post, highly degraded visible remnant at surface level, 15cm diameter. Burnt fragmentary remains with associated posthole forming	Miscellaneous
NC16	634676	6029598	Track. Linear shallow grade feature approx. 3 m wide and extending upslope towards and east of hut site. Dirt surface and rutted with some braiding/replication upslope. Artefacts including a horseshoe, glass, ceramic and metal fragments are exposed on the surface c. 50 m upslope.	Transport
NC17	634211	6029475	Post/pole. Base of hardwood post, 29 cm diameter, cut at ground level. Protruding threaded steel tether rod/bolt 90 cm long protruding from ground 5 m to the east and angled towards pole, probably a cable fixture for the standing structure. Cable and	Miscellaneous

ID	Easting	Northing	Description	Theme
			metal couplings possibly associated with the structure are lying on the surface c. 15 m to the east of the pole. Additional pole bases of the same type were noted at the following points: 634466.6029491; 634502.6029494; 634875.6029583; 634939.6029253.	
NC18	634605	6029485	Boiler stacks (?). Three lengths of old rusted steel riveted pipe/cylinders. c. 40 cm diameter, one section 2.2 m long, one 1.2 m long, one 2.1 m long. The cylinders are riveted at 25 – 30 cm spacing across and along joins in the sheet (both lengthways and across sections). Rivet-affixed hooks are apparent on two of the cylinders. The artefacts occur adjacent to a modern soil push/dump.	Mining
NC19	634626	6029500	Pit/costean. Hand-dug pit 5 m x 3 m x 1 m deep with fringing mullock/mounding. Appears to be considerably older than nearby sand mining.	Mining
NC20	634833	6029607	Old road/track. Dirt vehicle track remnant cut into basal slope on south side of The Link Road; ramps upward from old crossing/ford on Bullocks Head Creek. Orientation 80/260 degrees, c. 4 m wide and truncated by modern road at upslope extent.	Transport
NC21	634887	6029594	Old ford/creek crossing. Point at which old dirt vehicle track c. 3 m wide and oriented 155/335 degrees crosses Bullocks Head Creek.	Transport
NC22	634917	6029611	Old bridge. Concrete and steel bridge associated with old Cooma-Tumut Road spanning Bullocks Head Creek. c. 30 m long x 3.5 m wide, consists of concrete and BHP steel girders set on concrete piers. Steel barrier/hand railings line the upper edges of the bridge. Graffiti evident beneath the bridge date back to the early 1960s/1950s. Old hardwood timber beam/pole supports are apparent beneath and semi-incorporated into the bridges structure. They show signs of having been partially burnt. Not clear if these predate the bridge or are contemporaneous preliminary supporting construction features. A SMA survey mark set in concrete is incorporated into the south side of the bridge at 634915.6029595.	Transport
NC23	634894	6029591	Old foot bridge. Stone and earth embankments with level walkway surfaces positioned on either side of Bullocks Head Creek, c. 7 m long x 3 m wide x 80 cm high, oriented 330/150 degrees. Foot track width on top of banks is 1.8 m with well-defined stone edging. South embankment at 634894. 6029592, north embankment at 634887. 6029611. Remnant timbers are apparent within the bed of the creek on both sides and at least one upright remnant post remains set in the creek on the north side.	Transport

ID	Easting	Northing	Description	Theme
NC24	634883	6029577	Gold workings. Possible early phase alluvial mining tailings mounds and apparent later phase dredging in the valley bottom on the southern side of Bullocks Head Creek. Earlier mounding occurs directly along the side of the creek on the southern bank upstream of GR 634875. 6029582. A substantial enclosure bounded by linear earth embankments c. 2.5 m wide x 1 m high contains a worked zone including a pond with rusted riveted steel plates (boiler stack remnants?). The enclosure is fed by upslope races directly to the south. Grid references for the four points defining corners of the enclosure are: 634891.6029558, 634856.6029540, 634826.6029584 and 634805.6029547; epicentre c. 634845.6029561.	Mining
NC26	634888	6029540	Power/telegraph pole. Fallen hardwood pole c. 3.3 m long x diameter 27 – 37 cm. Twin brown glazed ceramic insulators (power?) with single white glazed ceramic insulator (communications?) at top of pole. A bracket with an insulator is located c. 4 m to the west of the pole.	Miscellaneous
NC93	634503	6029537	Mining equipment. Items of heavy mining machinery dating to c. the late 1800s or early twentieth century and likely used in the local area on display in a roadside picnic and interpretation area next to The Link Road. Precise provenance, context and identification of most of the machinery is not provided. Includes: A complete standing stamp battery at 634499.6029539; an iron subframe at 634502.6029534; an iron pipe or pressure chamber at 634506.6029553; a drilled/ported steel cylinder presumably from a dredge at 634523.6029534; and a bolted iron plate bin with sliding hatches and a large cog lying adjacent at 634544.6029529.	Mining
LSU5/H3	635055	6029783	Memorial. Located on top of cutting, north side of Link Road, near Highway intersection. Modern memorial (2015) for 'VIC'. Stainless steel plaque/plate 12 cm x 6.5 cm riveted to squared section (5 cm x 5 cm) stainless steel post 37 cm high. Small pile of local cobbles mounded around base. Plaque angel mounted with inscription and date (13 th April 2015). Characters laser printed/etched in black. "VIC 13 th April 2015 "can you blokes stop friggin around so can get riding. I need a beer" Macca, Pip, Smithy and Gareth, Melinda and Family'.	Miscellaneous
LSU5/H4	635054	6029705	Snowy Hydro/Roads Depot/Camp. Located on creek flat between old and new Highway bridges, North side of Bullocks Head Creek. Alluvial flat/valley bottom zone on north	Miscellaneous

ID	Easting	Northing	Description	Theme
			<p>side of creek has been levelled and utilised for unspecified industrial activities/purpose. E.g. Camp, depot, yards, machinery/equipment storage and maintenance etc. [? Snowy Hydro/ Roads]. Zone previously mined for gold [cf. Gant-Thompson] but no discernible traces remain. Primary manifestation is a levelled, scalped/scraped surface that has experienced multi-phase utilisation followed by basic abandonment and 'rehabilitation' post dismantling, i.e. zone prepared, utilised (with infrastructure) then 'cleaned up' after use. Surface now level/slightly hummocky with occasional identifiable remains/features. 635013.6029700: Concrete platform/base. Two parallel concrete foundations/platforms each c. 3m long x 80cm wide set 4m apart. Soil/aggregate platform intervening space. Total base/platform feature c. 6m x 3m. No relief, for concrete surfaces are at ground level. Feature is c. 1m from road bund.</p> <p>634992.6029692 – 635026.6029656: Culvert/drain. Prefabricated concrete pipe drain (95cm diameter) and channel/ditch (3m wide x 60cm deep) running 140°/320° from Link Road to Bullock Head Creek, c. 40m. 635019.6029663 – 635104.6029703: Linear gravel and earth mound mechanically pushed along edge of Bullocks Head Creek (levee-like). c. 30cm to 1m high x 2 - 3m wide. Composed chiefly of local alluvial sand, gravel and cobbles, with some industrial refuse (rusting 44-gallon drums, steel cable/rods, metal road base, tarmac hot mix and fragments of tarmac road surface incorporated. 635026.6029666: 'dump'/concentration of discarded materials (44-gallon drums, tar/tarmac, aggregate/gravel, steel rod with treaded end, vehicle leaf spring, hardwood posts, reinforced concrete pipe. Incorporated into west end of and above linear mound/push at edge of culvert outlet. 635037.6029689: Hardwood sleeper embedded in ground. Visible section c. 1.5m long x 20cm wide. 635096.6029757 – 635126.6029700: Culvert/drain. Prefabricated concrete culvert point with 60cm diameter pipe under Link Road, draining to Bullocks Head Creek via c. 3m wide x 50cm deep ditch/channel c. 65m long. In general, levelled area a low-density scatter of embedded/loose modern i.e. 20th century waste indicative of industrial activity [heavy duty steel cable, asbestos sheet fragments, tyre fragments, blue metal aggregate and tarmac].</p>	
LSU5/H5	635091	6029698	Old pole/post. Located on north side of Bullocks Head creek, upstream from modern Highway bridge. Hardwood post, round cross section c. 20cm diameter x 2.05m tall,	Miscellaneous

ID	Easting	Northing	Description	Theme
			embedded in ground adjacent to creek. Appears to be reasonably old [weathered]. Nailed plastic tab fasteners (x 4 with remnant of one) set on alignment of south face. The post has been impacted by construction of gravel push along creek (i.e. pole has been tilted to south by push), so appears to predate Snowy Scheme. A comparable post stands in paddock to south of creek c. 80 m away.	

7.2.8 Three Mile Dam

The field survey at Three Mile Dam was conducted in October and November 2018. The Three Mile Dam survey area has been subject to a reasonably comprehensive field survey. This survey extended from the intersection with Link Road westward and hence north along a Transmission Line to the intersection with the highway at Kiandra.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland. Ground exposures were generally negligible. Certain areas were found to be highly disturbed by previous works particularly associated with the construction of the transmission line, road access and in some areas, historical gold mining.

The historic items previously recorded in the Three Mile Dam survey area are listed in Table 25. There are a number of sites associated related to theme of mining. There are no historic sites of State or local significance in the Three Mile Dam survey area. The potential historic items recorded at during the field surveys are listed in Table 26.

The Three Mile Dam survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 25 Three Mile Dam: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
5268			631315	6027810	3 Mile Quarry #2	According to KHA listing: <i>3 Mile Quarry #2 c1883</i> <i>Alternative - (Kiandra)</i> <i>Current site - Landform/earthwork</i> <i>Description - 'Excavation' indicated on 1906 plan of Lot 6 Parish of Kiandra. Probably a quarry for the dam wall earth fill.</i>	Mining
5267			631230	6027975	3 Mile Quarry #1	According to KHA listing: <i>3 Mile Quarry #1 c1883</i> <i>Alternative - (Kiandra)</i> <i>Current site - Landform/earthwork</i> <i>Description - 'Excavation' indicated on 1906 plan of Lot 6 Parish of Kiandra. Probably a quarry for the dam wall earth fill.</i>	Mining
4627			631060	6028130	Three Mile Dam	According to KHA listing: <i>Three Mile Dam 1882</i> <i>Alternative - 3 Mile</i> <i>Current site - Dam and reservoir</i> <i>Description - Earth wall dam built reportedly built by Chinese labourers as a reservoir for hydraulic sluicing claims on New Chum Hill - a major race leads there.</i>	Mining
	8307		631057	6028117	Three Mile Dam Wall		Mining
4995			630961	6028228	Roaring Mag Hut	According to KHA listing: <i>Roaring Mag Hut c1900s?</i> <i>Alternative - Roaring Magg</i>	Miscellaneous

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>Current site - Building ruin/site Description - Site of miners(?) hut. 'Roaring Mag' (or Magg) was a loud woman who lived there by her own. Does not appear visible on 1945 air photos.</i>	
317			633430	6032980	Gibsons Plain Linesmens Hut	According to KHA listing: <i>Gibsons Plain Linesmens Hut 1960-85 Alternative - Site 28 Current site - Building ruin/site Description - Probable site of prefabricated SEC powerline hut 24' x 12' constructed in response to heavy snow in 1960; corrugated iron. Site not investigated / recorded.</i>	Miscellaneous

Table 26 Three Mile Dam: Potential historic items recorded during the field survey.

ID	Easting	Northing	Description	Theme
3MSU1/H1	630961	6028212	Roaring Mag Hut. Collapsed stone chimney/hearth c. 4 m x 2.5 m x 0.5 m high with possible earth platform c. 5 m x 3 m adjacent to south. Alignment of stones and a possible corner posthole define potential eastern wall of structure. Impression is of a north-south oriented building with hearth at northern end. A shallow pit occurs directly to the west of the platform, with a second pit c. 1.5 m x 1.5 m located c. 9 m to the NW of the hearth at 630959. 6028223.	Mining
3MSU1/H2	631057	6028117	1882 Earth wall dam built reportedly built by Chinese labourers as a reservoir for hydraulic sluicing claims on New Chum Hill - a major race leads there.	Mining
3MSU1/H3	630853	6028200	Three fence posts on west side of Three Mile Dam. Part of pastoral landscape. Remnant fence line. Four standing split hardwood posts with c. 10 foot spacing, orientation 120/300 degrees. No wire evident and no drilling of posts for wire apparent. The posts were partially/nearly completely submerged by the Three	Pastoralism

ID	Easting	Northing	Description	Theme
			Mile reservoir at the time of recording. Accessible (westernmost) post is 1 m high x 15 cm wide x 10 cm thick.	
3MSU1/H4	630949	6028191	Remnant fence line. A series of five postholes in rough east-west alignment (90/270 degrees) paralleling modern fire trail culvert cut on north side of fire trail. A regular posthole spacing of 3 m (10 feet) is apparent at the western extent of the alignment. A square strainer post hole is apparent at 630925. 6028201. Some fragmentary straight wire rigged for droppers and remnant hingelock occur at GR 630949. 6028191.	Pastoralism
3MSU1/H5	630976	6028182	Metal (steel/iron) rail. Length of heavy gauge rail partially embedded in an earth push on the north side of a fire trail. The section of rail is 4 m long and has been bent; cross section is rough 'T' beam 12cm tall x 6.5/14 cm wide. The rail is composed of two lengths bolted together for at least half of the complete item's length utilising heavy 33/34mm bolts and washers. Remnant numbering and lettering apparent on one surface including '1949'. The rail appears to have been dumped or pushed along with the co-occurring earth mound. A section of steel cable and straight fencing wire occurs c. 10 m to the north of the rail.	SMA
3MSU1/H6	631038	6028184	Old fence line. Two standing billet split hardwood posts 48 m apart on a slope overlooking Three Mile Creek below the dam wall. The posts are 1.25 m tall x 25 cm wide x 15 cm thick. Remnant wire suggestive of a five strand plain with single barb fence occurs in association with the posts. Some fragmentary wire and possible postholes occur between the posts. Orientation appears to be N-S (0/180 degrees).	Pastoralism
3MSU1/H7	631057	6028163	Water race. Originates at given GR at base of Three Mile Dam wall, c. 30 m below current fire trail/wall causeway. The race is c. 3 m wide x 1.8 m deep, contouring in a north-south alignment from the outlet point. No ready evidence of the nature of the associated outlet structure (if any remains) is apparent.	Mining
3MSU1/H8	631033	6028137	Gate/valve apparently associated with original water outlet/race point on Three Mile Dam wall. The valve is completely submerged beneath the waters of the modern reservoir on the south side of the rock wall. It comprises a collapsed timber and iron structure including beams/timbers bolted together to form a	Mining

ID	Easting	Northing	Description	Theme
			framework for a steel/iron wheel valve. It is c. 3 m long x 2 m wide. The nature of the structure's position in relation to the original outlet is unknown; there appears to remain a correspondence with the race outlet on the direct opposite side of the dam wall.	
3MSU1/H9	631085	6028141	Water race. Earth ditch c. 3 m wide with a well-defined upslope cut and corresponding downslope bund. The interior of the race is partially infilled. Orientation is essentially south to north, originating at base of modern dam wall and contouring to the north for c. 40 m before being obscured/subsumed for 30 m by the larger race feature 3MSU1/H7. The race then reemerges in well-defined form and continues to parallel the creek line. The race appears to comprise a water management feature constructed prior to the large-scale damming of the creek as it is sited low in the drainage line (c. 3 m above the natural creek line) with its original southern extent now covered by the dam wall.	Mining
3MSU1/H10	631094	6028136	Dam wall/barrier. A boulder wall c. 20 m wide x 1.7 m high x 3 m wide constructed across the course of the original incised creek line. The feature occurs at the base of the modern dam wall and is possibly associated with the race feature 3MSU1/H9.	Mining
3MSU1/H11	631263	6027967	Quarry/borrow pit – 'Three Mile Quarry Number One'. A soil quarry associated with the construction of the 1800s Three Mile Dam. The quarry comprises two main tiers of roughly comparable dimensions cut into the side of a low hill, c. 38 m x 22 m (lower tier to south) and 30 m x 30 m (upper tier to north) between GRs 631292. 6028015 and 631238. 6027955. Two narrow north-south trending parallel pits occur directly to the west of the tiers (GRs 631213. 6027986 to 631245. 6028035 and 631223. 6027975 to 631275. 6028033). The southern extent of the pits front directly onto the current Three Mile Track.	Mining
3MSU1/H12	631363	6028040	Concrete footings. Two parallel concrete basal structures set upon a 10 m x 5 m cut earth platform on a crest/hilltop overlooking Three Mile Dam to the south. The platforms are rectangular in form 4.3 m x 1.4 m and constructed of poured concrete slabs 9 cm thick. The slabs are set upon coarse aggregate/cement bases. In total the footings are c. 25 cm high. Both slabs exhibit 'rail' indents and three	SMA

ID	Easting	Northing	Description	Theme
			inset threaded steel bolts/studs (apparent machinery mounts). A timber sleeper with bolts lies embedded into the platform adjacent to the slabs to the west with a square concrete plinth footing with twin bolts/studs at the approximate platform entrance. A large push of earth containing insulated electrical cable occurs c. 15 m to the west of the platform cutting.	
3MSU1/H13	631349	6027869	Snowy Hydro camp complex ('3 Mile Camp and Barracks'). An industrial settlement complex on the eastern side of the hill overlooking the current overflow/ outlet point from Three Mile Dam. Approximate site extent falls within GR 631349. 6027869 to 631501. 6028084 (S-N) and 631380. 6027951 to 631527. 6027898 (W-E). The complex is characterised chiefly by a series of eight major NNE/SSW trending benches or terraces mechanically cut into the hillside to provide level alignments for worker accommodation and associated infrastructure. Possible intermediate track or walkway terraces are apparent between some of the major cuts. Chief characteristics of the site include the following: a sub-complex of concrete building slabs and basal infrastructure on the southern end of the terraces between GRs 631395. 6027933 and 631433. 6027982; 'bare' earth terrace settings (for mobile barracks buildings/tents?) between GRs 631433. 6027982 and 631501. 6028084; pushed earth and waste structural materials including brick at the northern extent of the site at 631501. 6028084; a toilet/shower block at 631466. 6027917 with downslope sewer pipe and sump (GR 631490. 6027904) and settling pond (GR 631527. 6027898); a concentration of slag debris possibly associated with workshop activity at 631444. 6027889; a borrow pit with formed pond at 631432. 6027849 and; a series of bulldozed mounds containing waste structural material on the creek flats at 631488. 6027866.	SMA
3MSU1/H14	631350	6027749	Soil quarry ('Three Mile Quarry No. 2'). Quarry or borrow pit cut into the base of the slope on the eastern side of the overflow channel from Three Mile Dam. The pit area is approximately 20 m (E-W) x 23 m (N-S) x 3-6 m deep. There is some potential for the quarrying activity to extend further around the base of the slope.	Mining

ID	Easting	Northing	Description	Theme
			The excavated surfaces are now largely vegetated with eucalyptus regrowth and heath/shrubs.	
3MSU1/H15	631408	6027789	Concrete footing. A square footing/plinth set in the active bed of the creek/drainage line now acting as an outlet for the Three Mile Dam. The feature is c. 40 cm x 40 cm x 30 cm high and exhibits four inset metal threaded bolts or studs. It may comprise a base for a power or communications pole associated with one of the local Snowy Camps.	SMA
3MSU1/16	631450	6027763	Site of very early SMA camp that comprised ~40 tents, a hut and a hessian-walled shower block. Base for early roadworks creating access for Tumut sites. Replaced by the barracks camp in 1950. An area of landscape modification associated with an industrial settlement complex. It includes modified landscape surfaces and earthworks, water management features (drains and channels), artefact accumulations and structural remains. The complex is situated on a basal slope on the eastern side of the creek now acting as the overflow channel for Three Mile Dam. Characteristic features include the following: a largely obscured remnant concrete structure 45 cm x 70 cm with adjacent mound at 631450. 6027763; a concrete platform 10 m x 3 m in SSE/NNW alignment at 631461. 6027773 set upon an elevated surface adjacent to the creek. A pit to the NE is suggestive of wastewater management and exhibits some drystone edge reinforcement; two stone and concrete box structures suggestive of a fireplace or oven at 631460. 6027736; a 3 m wide NW/SE trending dirt/rubble surfaced road (noted by KHA) passing through the site at 631465. 6027733; a N-S trending two-tiered borrow pit c. 65 m x 15 m x 4-5 m deep with drainage channel cut into the basal slope at 631463. 6027714; an eroded area c. 2 m x 80 cm with charcoal and concentrated artefacts including ceramic, glass, metal, nails, buttons and leather at 631485. 6027728; a rectangular cut building platform 8 m x 4 m x 60 cm deep at rear facing onto dirt track at 631515. 6027747; an E-W oriented concrete slab c. 6 m x 2.5 m on a level surface overlooking the creek at 631490. 6027794; a rectangular building platform cut c. 9 m x 4 m on basal slope adjacent to a track at 631530. 6027778 and; an historical scarred tree – dead sawn-off trunk 1.6 m	SMA

ID	Easting	Northing	Description	Theme
			tall, 30 cm diameter - exhibiting a 35 cm x 17 cm x 8 cm deep scar on its E/ENE face. The scar exhibits an axe-chop blaze mid-way along and across its face.	
3MSU1/H17	631409	6027733	Cultural scarred tree. A dead mature eucalyptus tree c. 10 m tall and 1.5 m girth at breast height exhibiting a cultural scar on the north facing trunk. Scar dimensions are 87 cm x 22 cm x 7 cm deep with base 50 cm above ground level. Estimate tree to be not old growth nor scar to be of Aboriginal origin.	Miscellaneous
3MSU1/H18	631347	6027716	Water race system. The race is roughly 'Y' shaped and E-W trending, commencing near the current high-water mark at Three Mile Dam and extending along a rough easterly contour through and beyond the zone of survey. In the west the race system commences as two indistinct parallel earth ditches at 631306. 6027730 (north race) and 631321. 6027707 (south race). Both races have been bisected by the Three Mile Track and are apparent as deep, overgrown ditches on the east side of the road at points 631347. 6027716 and 631348. 6027697 respectively. Race dimensions are c. 2.5 m to 3 m wide and 50 - 80 cm deep. The north race is cut by the large borrow pit at site 3M15 at 631424. 6027670 and re-emerges on the pit's eastern side at 631449. 6027654, while the south race continues just upslope of the borrow pit. To the east of the borrow pit the two races run roughly parallel until they converge at 631495. 6027662 to form a single large race 4.2 m wide x 1.2 m deep. This feature exhibits a feeder breach/drain at 631516. 6027674 and continues to follow the contour (presumably to connect with the race system and/or workings flanking Three Mile Creek/Bullocks Head Creek further downstream). The race/races are heavily overgrown with native vegetation, including numerous old eucalyptus trees, some very large and long-dead mature specimens included.	Mining
3MSU1/H19	631184	6028085	Memorial. Memorial site associated with rock outcrop on a crest overlooking Three Mile Dam to the south. Chiselled and white painted capital letters 5 cm tall spell 'BELLA' on a small, low shale panel, east facing and c. 1.2 m high x 3.3 m long. The total inscription is 25 cm x 5 cm, set 55 cm above ground level.	Miscellaneous
3MSU4/L1	631346	6029579	A platform measuring 7 x 12 m (NW/SE). Steel and wooden structures. Steel structure: 1.73 m wide, 75 mm x 75mm angle with ½ disc bolted on mount for	Miscellaneous

ID	Easting	Northing	Description	Theme
			another disc. The ½ disk: 61cm high x 34.5 cm wide. Hardwood sleeper embedded in ground. Wood post (1.47 m high x 23 cm diameter) with cross beams. Two bearers bolted onto top of post (95 x 95). Post 1.21 m long. Top joints (95 x 95 2.3 m long. Remnant wire on one joist. Appears to have newer galvanised washers and bolts and 4 corner star pickets surround the wooden structure.	
3MSU4/L2	631671	6030133	Water race orientated NE/SW. Well preserved. Measures c. 2 m wide. Note an area of what looks on aerials to be mining in drainage line to east in upper reaches of Racecourse Ck.	Mining
3MSU9/L1	631792	6030802	Water race orientated N/S. Well preserved. Measures c. 2 m wide x c. 65 cm deep.	Mining
3MSU10/L1	632128	6031051	Mining activity: large tailings mounds along vehicle track, west of transmission line. Continues to east site of creek. crossing. Major area on the west side of creek. Possible vestigial water races. The current causeway is constructed from tailings.	Mining
3MSU11/H1	632334	6031545	Hut site: cut earthen hut platform with a collapsed stone hearth. A scatter of glass, metal, brick and ceramics associated with platform. Flowering daffodils at time of recording. Wooden fence post nearby with rabbit roof netting. West of vehicle track.	Miscellaneous

7.2.9 Gooandra Fire Trail

The field survey at Gooandra Fire Trail was conducted in October and November 2018. The Gooandra Fire Trail survey area has been subject to a reasonably comprehensive field survey. This survey extended from the intersection with Snowy Mountains Highway and eastwards to Bullocks Fire Trail.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland. Ground exposures were generally negligible. Certain areas were found to be highly disturbed by previous works particularly associated with the construction of road access and in some areas, historical gold mining.

The historic items known to be present in the Gooandra Fire Trail Area are presented in Table 27. There are no historical items of State or local significance in the survey area. Four previously recorded sites are associated with the theme of mining including the Six Mile Diggings and the Tantangara Diggings. The potential heritage items recorded during the fieldwork are described in Table 28.

Table 27 Gooandra Fire Trail: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
4529	1663		636004	6035323	Six Mile Diggings	According to KHA listing: <i>Six Mile Diggings 1860-1930s Current site - Mine workings (abandoned)</i> <i>Description - Major alluvial diggings spread over area 700 x 400m</i> See below - GSU6M	Mining
4921			640174	6037978	Miners Hut	According to KHA listing: <i>Miners Hut c1860s-1890s</i> <i>Alternative - (Tantangara Ck)</i> <i>Current site - Building ruin/site</i> <i>Description - Possible miners hut site from mid-late C19th; loose rocks and slight heap, remains of iron pan partially buried.</i> See below - GSU20/H1	Mining
4920			640220	6038030	Tantangara Creek Diggings	According to KHA listing: <i>Tantangara Creek Diggings c1860s-1890s Current site - Mine workings (abandoned)</i> <i>Description - Extensive diggings and sluicing like disturbances on the creek flat and along the creek banks/slopes over approx 1 km</i> See below - GSU22/H5	Mining
4601			640240	6038250	Tantangara Creek Gold Dredging	According to KHA listing: <i>Tantangara Creek Gold Dredging 1900-03</i> <i>Current site - Mine workings (abandoned)</i> See below - GSU22/H5	Mining

Table 28 Gooandra Fire Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
GSU1/H1	635266	6035441	Old fence. Old fence line, N-S trending orientation; mostly vestigial. Fallen hardwood posts and remnant posts, postholes and fallen wire (old single barb, sheep mesh and plain wire). Post spacing c. (?) 7 m. Partially obscured by grass/shrub growth. Posts have been burnt and are in a state of decay. Appear to be about 12 -13 cm thick and length of best-preserved post 110 cm long. Ringlock apparent at south end of fence line. Runs along crest to meet/cross Gooandra Track in south where it becomes indistinct with only occasional outcropping remnant wire and occasional post stump and hole [at this point becomes component of SU1/H2]. The fence is in very poor condition. Old fence remnants do provide good indication of alignment and basic materials used. There is no potential for associated relics.	Pastoralism
GSU1/H2	635254	6035238	Stock yards. Located just south of Gooandra Track near the bend. Area now largely defined by cropped green grass in native tussock background [phosphorous signature]. Remnant fence and linear fence mount defines boundaries. Area c. 50 x 40 m [NS/EW]; post remnants, stumps, postholes, placed stones, chicken wire, plain gauge, ring lock and hinges. At least 3 or 4 yard divisions. Old rusted tins [? oil tins] and bottle glass in rock outcrop directly east of yards. Post holes and mounded earth at 635276.6035253 and may suggest a structure. Well defined by vegetation change and vestigial materials and postholes. Current Gooandra Track may have cut through north end of site.	Pastoralism
GSU1/H3	635262	6035285	Old road/ track. Grid reference in point of intersection with Gooandra Track. Shallow graded dirt track, essentially N-S trending. Braiding/duplicate tracks are apparent at 635265. 6035308. The track continues north along crest feature and parallels old fence line [SU1/H1] running along east side of fence. Runs as two parallel eroded features 4-5 m wide that converge at 635296. 6035510 and becomes heavily overgrown and less distinct to north at 635289.6035558. There is no potential for associated relics.	Transport

ID	Easting	Northing	Description	Theme
GSU2/H1	635543	6035209	Old stock fence. Located west side of Eucumbene River, north of Gooandra track. Runs upslope of river and crosses into SU3 and SU4. Old remnant fence line trends E-W; mainly evidenced by occasional outcropping wire. Very occasional collapsed hardwood post [fragmentary], postholes and stumps. Plain wire and remnant sheep mesh with posts. From 635543.6035209 fence runs west upslope for several hundred metres potentially connecting with yards area at SU1/H2. Fence continues east, ceramic insulator tied into wire at 635596.6035197 [? old electric fence]. Wires and remnant posts continue down onto river flat at 635636.6035186. The fence is in very poor condition but remains indicative of alignment/boundary. There is no potential for associated relics.	Pastoralism
GSU3/H1	635705	6035050	Graded/levelled strip. N-S trending. Site extends from 635737.6035138 to 635659.6034927 (c. 230 m long and 15 m wide). A shallow graded/cut feature, N-S oriented on low crest overlooking Eucumbene River valley bottom. Upslope cut c. 40 - 50 cm deep with corresponding downslope push/linear mound forming the eastern boundary of feature. Bedrock gravels and boulders [shale and quartz] have been exposed across the surface of the strip. Function of the feature is unknown. There is no potential for associated relics.	Miscellaneous
GSU4/H1	635832	6035063	Metal pipe/post. Located east side of river crossing, c. 20 m south of Gooandra Track. Steel pipe [100 mm diameter] filled with concrete and driven upright on river bank. Pipe extends 70 cm above ground level. Pipe at rough point of confluence between minor creek and Eucumbene River, c. 20 m downstream of bridge/ culvert over river. Function unclear. Directly to south is a cutting c. 3 m wide and an entry ramp for a dirt vehicle track c. 10 m long and NE/SW trending. Old crossing on Eucumbene River ? original track. There is no potential for associated relics.	Miscellaneous
GSU4/H2	635836	6035071	Straight channel. Located east side of Eucumbene River. Channel 35° orientation from downstream extent [ie. looking upslope]. Drainage line artificially straightened c. 70 cm wide [active channel] and 1.2 m deep. Possibly connects with previously recorded six-mile channel to NNE. Roughly parallels Gooandra Track in the vicinity. There is no potential for associated relics.	Mining

ID	Easting	Northing	Description	Theme
GSU4/H3	635787	6035182	Diggings/mining. Located on creek/river flats upstream of river crossing and east side of river. Pit c. 3 x 2 m and 1 m deep, rectangular in form with mounding around edges. Apparent worked area and modified drainage channel c. 4 m to SW. Two shallow ponds c. 15 m to east are a connected by same drainage channel and may be the product of associated mining activity. The ponds occupy an area c. 25 x 15 m with apparent low mounding for some length along east edge. No readily apparent tailings mounds in area. River flats here exhibit multiple relict/modified channels supplementary to current active main channel, but there is an absence of rocky mounds/features produced by mining using sluicing [perhaps shallower puddling/ paddocking]. There is no potential for associated relics.	Mining
GSU4/H4	635773	6035260	Mine workings. Overlooking Eucumbene River flats/on flats. Eroded/cut basal slope with apparent water management channelling. Heavily overgrown and largely obscured. Working on south facing basal slope c. 2 - 5 m deep. Ongoing erosion is extending the cutting upslope – could be result of sluicing into face of cutting; no large or rocky tailings mounds area apparent. Old track [? bridal track] runs just upslope. Note: old track falls outside survey zone boundary but close.	Mining
GSU4/H5	635524	6035294	Mining pits. Located on upper Eucumbene River flats. Two rectangular pits on river flats, c. 10 m apart. Pit 1: 4 m x 3 m and c. 0.70 m deep at 635524.6035294. Pit 2: 4.5 m x 3 m and c. 0.80 m deep at 635514.6035284. Low spoil mounds including cobbles and river pebbles around edges. The pits are connected by a drainage channel c. 0.5 m wide and now infilled and overgrown by grass. The current active river channel flow past c. 2.5 m from Pit 2. A third pit – potentially related occurs 5 m to the east at 635525. 6035284. it is roughly rectangular 2 m x 3 m and 0.5 m deep. It does not exhibit a connective channel and is not associated with the spoil piles.	Mining
GSU4/H6	635827	6035009	Ponds-mining. East bank of Eucumbene River. Two ponds in boggy setting adjacent to river. Most likely artificial. Pond 1: at 635827.6035009 c. 30 m long x 4 m wide and a minimum 0.60 m deep; roughly parallel to river with outlet	Mining

ID	Easting	Northing	Description	Theme
			channel to main stream well cut. Pond 2: at 635838.6035035 c. 5 m long x 3 m wide. The two ponds exhibit no major mounding but abut a rise of ground next to river. An artificial drainage channel separates the ponds. It is c. 2 m wide and extends in a curve to the east to connect with 'site' at SU6/H1. A length of 15 mm steel cable lies on river bank adjacent to ponds at 635823.6035029; relationship unclear.	
GSU5/H1	635823	6035273	Old track/[?]bridle track. Located on west edge of Six Mile Diggings. Appears on topographic map as a track. Runs along edge of impact zone and beyond to the west/south-west. Old access track contouring spur crest from along Eucumbene River to the west and accessing Six Mile Diggings. Cut into spur crest and spur side, c. 1.5 m wide with push on outside edge [bund] to retain level. Surface is level and well-defined. At points outside study area boundaries the track is shored up with stacked stones. Cutting between c. 0.5 m to 1 m high. Runs from 635823.6035273 to 635841. 6035309 where it turns into the digging's valley (dog legs) and manifests as previously recorded 'race' feature SMD4. In mining valley, it becomes more eroded and continues as a very race-like (if not a race) ditch feature.	Transport
GSU5/H2	635875	6035299	Pits [Six Mile Diggings]. Rectangular pits in mining zone, associated with minor drainage line/crest zone. Pit 1: c. 1.7 m x 1 m x 0.4-0.5 m deep at 635875. 6035299. Pit 2: located 10 m to the south east of pit 1; c.1.2 m x 1 m x 0.30 m deep at 635890. 6035301. Pit 3: located 20 m to the south of pit 2; c.1.2 m x 1 m x 0.30 m deep at 635885.6035277.	Mining
GSU6/H1	635824	6034926	Valley bottom altered by mining. Located on feeder drainage line in valley on east side of Eucumbene River and extends upstream to Six Mile Diggings. Entire drainage depression showing alteration from mining. Now a boggy/wetland zone flanking east side of Eucumbene River; suspect this has been the result of mining. Main readily visible features include: an extensive drainage channel c. 3 - 5 m side with flanking spoil/excavation mounds, running roughly N-S along extent of valley [north and south of grid references]. Feeder/offshoot channels at least one deep, rectangular pit [at 635820.6034943; 10 m x 3 m x 1.5 m deep].	Mining

ID	Easting	Northing	Description	Theme
			additional ponds in zone towards river channel. Wetland/bog zones may represent infilled mined areas throughout the valley bottom/drainage line. Area is heavily overgrown with grasses. Note: extends further south at this point. Not sure if the area has been dredged – no mounded tailings evident.	
GSU6/H2	635960	6035102	Fence line. Located on eastern side of Eucumbene River. E-W trending remnant fence line passes through swampy/boggy valley bottom and extends up adjacent slope/crest zone to east. Hardwood split posts and stumps; drilled for five strands of wire; spacing in valley bottom c. 3 m apart. Drainage channel and ponding (SU6/H1) in this area. The fence is in poor condition but remains indicative of alignment/boundary. There is no potential for associated relics.	Pastoralism
GSU7/H1	636049	6035237	Stone feature – [?] hearth. Located on a basal slope at the southern end of Six Mile Diggings. Dry stone construct adjacent to previously recorded hut site (SMD1). Heavily overgrown with grass and partially obscured by mullock from animal burrows. Site is c. 4 m south of SMD1. c. 1.6 m x 1.4 m local dry-stone right angle [possible corner] roughly 4 courses high, old timber post embedded at north corner/end. Feature c. 40 cm high. Old wire incorporated into coursing. Rusted metal panel/sheeting coming out of rabbit burrow above. There is good potential for associated relics.	Mining
GSU7/H2	636004	6035162	Old access road/track. Located at south end of Six Mile Diggings on creek. Rutted vehicle route from creek and upslope. No graded/cut surfaces, rather a series of parallel and deep wheel ruts occurring in a corridor up to 12 m wide, running upslope from valley to ENE.	Transport
GSU7/H3	636358	6035147	Race. Water race roughly contouring upper slope/crest unit to SW of old Gooandra Track. Largely overgrown and obscured; from cut to edge of downslope mound c. 1 m wide and 30 cm deep. From grid reference 636358.6035147 race trends 223°	Mining
GSU7/H4	636386	6035166	Old road. Oriented at 33° from 636386.6035166. Well defined, graded and formed section of original Gooandra Track. Old road is 3 m wide with bund and upslope cut of maximum c. 1 m.	Transport

ID	Easting	Northing	Description	Theme
GSU7/H5	636413	6035177	Mining pit or borrow pit [function unclear]. Elongated, sloping pit c. 12 m long and 3.5 m wide. Depth ranges from ground level at south end to c. 1.5 m at north.	Mining
GSU7/H6	636208	6035274	Race. Crossed current Gooandra Track at 636208. 6035274. Start point on creek at 636244.6035219 and runs across slope to cross track continuing to the north west towards Six Mile Diggings. Slightly indistinct due to grass regrowth. The race measures 1.4 m wide x c. 30 cm deep and probably connects with previously recorded Six Mile Diggings race to NW.	Mining
GSU7/H7	636127	6035262	Tailings mounds. Located on south side Gooandra Track next to creek. Earthy tailings mounds of limited size in drainage line. Occupy an area c. 20 m x 15 m. Appearance of benching below eroding cut at upslope extent. Impression is of parallel water channelling at right angle to creek line with working along water and into slope. There is potential for adjacent creek/drainage line to have been worked upslope and downslope from this point [the drainage line is eroded and enlarged with multiple channels].	Mining
GSU7/H8	636064	6035301	Race/worked channel. Water race, crosses Gooandra track at 636064.6035301 and continues either side in a N-W alignment. Quite substantial feature; at least 2 - 2.2 m side and 50 cm deep. Possibly a linear working as the downslope mounding along the ditch is substantial and gravel is exposed in bed.	Mining
GSU9/H1	636920	6035873	Old road. Located off side of current track. Old dirt track remnant, c. 3 m wide and cut both sides 40 - 50cm deep. Currently utilised as drainage culvert from upslope point.	Transport
GSU15/H1	638271	6036789	Old track located off NW side [downslope] of Gooandra Fire Trail. Vestigial section of dirt vehicle track[?]. Shallow cut on upslope edge with some downslope [bund] push. c. 2.5 m wide [max.]. Curves gently across spur top from north orientation to north-east. Narrow feature – one vehicle wide, connects with access track to Gooandra Homestead.	Transport
GSU15/H2	638678	6037345	Access track to Gooandra Homestead. Twin wheel rut vehicle track 3 m wide oriented 140° from grid reference and runs in direction of Old Gooandra Homestead. Also, length of old track, grassy twin wheel ruts, c. 2 m wide and	Transport

ID	Easting	Northing	Description	Theme
			roughly paralleling modern road at 638638.6037238; oriented basically north/south.	
GSU15/H3	638507	6037049	Old stock fence. Fallen drilled split hardwood post at 638507.6037049 with single remnant straight gauge wire strand. Aligns north-south with other posts and wire remnants to the south. Above post fallen and in thick Eucalypt regrowth. Next post to south at 638503.6037021 then deviates to 340° alignment and continues as a series of fallen posts and wire into bush for c. 50 m where it terminates, tied around old dead fallen tree. Site condition is fragmentary. Provides good indication of alignment and boundary.	Pastoralism
GSU15/H4	638432	6036837	Old fence. Hardwood split post fallen, one remnant strand plain gauge wire; 2 post holes and fallen post to southwest and continues to standing post at 638383.6036802; 227°/47° orientation; post hole spacing c. 2.2 m; standing post suggest dimensions 1.2 m x 15 cm x 9 cm; drilled for five strands wire; fence continues to 638249.6036710; post drilled for six wires at 638226.6036696; strainer post at 638216.6036692; fallen post at 638054.6036513; fallen post drilled for 5 or 6 wires at 638052.6036510.	Pastoralism
GSU15/H5	638103	6036610	Old road remnant. Parallels current Gooandra Track. Has been cut into by modern road; remnant is c. 1 m wide with upslope cut c. 40 -50 cm at point of contact with modern road; widens to original cut at 638090.6036595, c. 2 - 2.2 m. Well preserved section of a defined, narrow vehicle track. Some mature Eucalypt trees growing from cut.	Transport
GSU16/H1	638711	6037531	Old track? Section of what appears to be an old track; two-wheel ruts with one rut now an active horse pad; width c. 2 m diverges from modern track at 638711.6037531 and continues at a 145°/325° orientation.	Transport
GSU19/H1	639885	6038756	Fence remnants. Some sections of plain gauge wire – loose and some embedded indicative of an E-W trending fence line. Running downslope towards creek/flat. No posts or postholes apparent. Most wire evident over c. 10 linear metres; plentiful amount of embedded plain gauge wire runs in a N-S orientation from 639879.6038698 (south) to heavy linked and tied wire at 639879.6038761	Pastoralism

ID	Easting	Northing	Description	Theme
			suggestive of a corner in paddock/enclosure on creek flat; continuation of N-S alignment contest with standing post to south.	
GSU20/H1	640201	6037969	Mining/old road/possible stone structure or test pit. Mining on Tantangara Creek at crossing; general evidence of gold mining in creek channel; ponding; tailings; mounds and channelling. Large riveted steel pipe in creek bed on west bank c. 40 metres south at 640184.6037931. Old road/the approach and crossing point at the location. Cut and banked c. 70 m long trending 40°/220°. ?test pit or possible stone structure/building; with flanking spoil at 640176.6037975. c. 3 m across; 30 – 40 cm deep; stones flanking edges; west of the creek and 2 m from current track; opposite signage. Placed stones at south side of dugout patch suggestive of rectangular form with corner. c. 2.2 x 1.5 m; maybe roughly N-S trending dug out platform c. 4.5 m long x 3 m wide with hearth at south end. Possible cut platforms on land surface adjacent and overlooking creek crossing.	Mining
GSU21/H1	640138	6037895	Scalped and pushed zone. c. 100 m to SW of Tantangara Creek crossing and 20 m from Gooandra Track. Area c. 20 x 10 m has been scalped with soil pushed into fringing embankment along downslope side; depth c. 20 – 30 cm across; baring reefing bedrock underneath; manifested as denuded/eroded rocky gravelly zone.	Miscellaneous
GSU21/H2	639644	6038101	Old track. Section of old Gooandra Track. Cuts across dogleg/bend in modern re-alignment. Overgrown and grassy; c. 2 m wide and trending basically E-W with curve along course.	Transport
GSU22/H1	640347	6038026	Water race. Located adjacent to Gooandra track on north side. Race c. 4 m wide and 30 – 40 cm deep; tracer 'contour' but in sinuous form [ie. not dead straight], upslope cut, downslope mound/bank. Orientation roughly east-west. Site condition is moderate - race is filled in to some degree. There is low potential for associated relics.	Mining
GSU22/H2	640259	6038037	Old stock fence. Located on upslope/downslope sides of Gooandra Track and east side of creek crossing. Fence crosses creek at 640131.6038189. Split timber posts, drilled, appears to be a six-strand plain wire fence, c. 6 m spacing. Most of fence collapsed. Extends into adjacent landscape either side of Gooandra Track. Spacing reduced to 2 m on upslope section of fence line. Orientation is 130°/310°.	Pastoralism

ID	Easting	Northing	Description	Theme
			Standing post 1.25 m high 23 cm side and 12 cm thick. Strainer post (now gone) evidenced by remnant tied and looped wires at 640190. 6038123. Fence is in poor condition. There is no potential for associated relics.	
GSU22/H3	640107	6038066	Cylindrical metal feature and metal sheeting in creek depression. Cylindrical metal feature c. 40 cm diameter located c. 15 metres and 270° from grid reference. Rusty metal sheeting protruding from ground on NE bank and 2 m from creek bank. A collared, rivetted feature 65 x 85 cm long [as above ground] – it has a previously joined rivet section now popped free. Possibly from early to mid-20 th century.	Miscellaneous
GSU22/H4	640145	6038192	Tailings mound and possible channel. Located on south southeast creek bank. Elongated low mound of river and local bedrock cobbles; c. 6 m long x 2 m side x 1 m above adjacent lowest point in creek channel which is an offshoot channel [possibly artificial]. The channel might be the working zone from which the cobbles originated.	Mining
GSU22/H5	640238	6038310	Tantangara diggings. Located in a depression on opposite side on prominent meander acute bend. On the big flat; an upstream diversion around base of spur crest, and a channel with adjacent tailing mounds – mounds appear both elongate in from and mound – in central area. In channels, appears to be pits paddocking and on opposite side of bank, it is possible the area may have undergone hydraulic sluicing considering the large area of bank erosion. Site is c. 1 ha in area.	Mining
GSU6M	636022	6035320	Six Mile Diggings [SMD]. Upstream and downstream of causeway at 636022.6035320, both sides of drainage channel and enclosed zones. SMD characterised by heavily eroded ‘amphitheatre’ drainage line with adjacent tailings mounds and artificial channels. Fringing area exhibit races, test pits, tracks, ditch/mound features and a hut. Stone/gravel mounds [tailings] of varying form (mounded, semi-mounded, linear), ditches/ embankments/ channels/dams. Tailings exhibit some variation from downstream [alluvial gravels and cobbles] to further upstream where basalt cobbles dominate with large water rounded quartz pebble and cobbles. SMD 1: Hut base/cut at 636056.6035247; 6 m x 3m N-	Mining

ID	Easting	Northing	Description	Theme
			<p>S Cut into base of slope; stone hearth on upslope side. Pieces of structural timber; steel sheets; glass; nails; can; bottle and large circular saw evident. SMD 2: Partial timber lined vertical shaft/pit excavation into tailings mound at 636049.6035277. Appears to be square, roughly 1.5 m x 1.5 m and c. 1.2 m deep. SMD 3: Straight channel with adjacent tailings mound at 635970.6035203. Feature is c. 40 m long with NE/SW orientation. Mound c. 3 m wide and 40 cm high. SMD 4: Race (ditch and mound) at 635919.6035248. c. 4 m wide and 40 cm deep. Curves through low-lying terrain to west of creek and fire trail. Cut by Gooandra Track at 635943.6035257. Rough E-W orientation and curves north and then back alongside of adjacent spur at 635850.6035308. SMD 5: Race at 635953. 6035377. A comparatively small ditch and mound 2 m wide and 30 cm deep. Curving; rough N/S orientation; in valley bottom adjacent to diggings area. SMD 6: Race at 635928. 6035598. At this point, two parallel features. Ditches in spur side/slope above diggings. Possibly upper one constructed over one below. c. 3 m wide with well-defined bank on down slope side; orientation N-S. SMD 7: Linear cut feature at 636011.6035745. N-S orientated linear cut feature adjacent to workings; c. 3 m wide and minimum 35 m long. c. 80 cm deep cut on upslope side. Appears to be a road or track. SMD 8: Curved earth embankment at 636073.6035830. curved earth embankment, possible water management feature. Upslope of diggings area. Curved earth bank/cut c. 30 cm to 1 m high and 60 m long. Bank up to 3 m wide and an outlet opening about 2 m wide on SE point. Possible inlet upslope where drainage line enters. Contains area c. 30 m x 15 m. SMD 9: Race at 636171.6035860. Race, well upslope of diggings and upslope of SMD 8. c. 3 m wide x 50 cm deep. NW-SE trending. Stone walling at point crossing drainage line. Opening near crossing connects with drainage line running into embankment feature/ enclosure at SMD 8. SMD 10: Shaft/costean at 636206. 6035823. Circular pit form 4 m diameter and 2 m deep. Low earth mound around edge. SMD 11: Low stone walling with right angle on top of tailings mound at 636046. 6035666. Basalt boulders/cobbles placed 4 courses high. Height of wall c. 65 cm high maximum; length 2.2 m (NW-SE) and 1.7 m</p>	

ID	Easting	Northing	Description	Theme
			<p>(SW-NE). provides small semi-enclosed area. SMD 12: earth/stone embankment/ enclosure at 636034.6035638. Water management feature (pond/pool/dam). Depression/excavation depression roughly rectangular in form, c. 20 m long (N-S) x 10 m wide (E-W). bounded by natural slope on east side, and substantial embankment/tailings in linear form along west and south sides. Channel inlet on north (upslope) end. "Pond" is about 1 m deep; containment wall/dam at south (downslope) end = earth/boulder construct about up to c. 1.6 m high and 2 m wide. West corner of wall at right angle marked by steel peg/pin driven into ground, c. one m from corner. SMD 13: Mounds (mullock) at 636068.6035586. Mounds (mullock) of underlying geological gravels (purple, orange, yellow, grey, blue) ? shales. Rectangular riveted trap-door bucket 78 cm x 58 cm lying in vicinity (in depression at 636074. 6035587). Pieces of steel sheeting (fragmentary) scattered in vicinity. Flooded, tailings lined pit (possibly with submerged upright timber remnants) at 636074. 6035612. Reverted iron flue (85 cm long exposed x 15 cm wide) lying next to above mentioned bucket. SMD 14: Curved earth bank at 636093. 6035642. c. 20 m long x 2 m wide x 30 cm – 80 cm high. Function/role unclear. Directly overlooks eroded north end of diggings field. SMD 15: Pit/shaft at 636097.6035635. Roughly circular, c. 4 m diameter x 2.2 m deep. On near-level area directly above eroded diggings area. SMD 16: Pit/ shaft at 636119. 6035609. Roughly circular, c. 4 m diameter x 2.2 m deep. On near-level area directly above edge of diggings. Depression/pit base appears to be square/rectangular in form; 1.3 m x 1.8 m with at least one very well-defined right angle/straight edge corner. SMD 17: Race at 636128.6035557. Race, trending N-S, c. 2 m wide. Appears to be fork at 636127.6035574 running downslope. SMD 18: Race at 636157.6035584. Trending NW-SE c. 2 m wide. Upslope and connected to SMD 17 at 636134. 6035631. SMD19: Pit/shaft /costean at 636232.6035572. Roughly oval in form; c. 7 m x 4.5 m x 2 m deep. Low fringing mound of blue/grey shale/schist. SMD 20: Pit/costean at 636181.6035533. Shallow (c. 40 – 50 cm deep); roughly circular; c. 3 m diameter.</p>	

7.2.10 Nungar Creek Fire Trail

The field survey at Nungar Creek Fire Trail was conducted in October 2018. The Nungar Creek Fire Trail survey area has been subject to a comprehensive field survey. This survey extended along Bullock Hill Fire Trail (from the junction to Gooandra) to the junction with Nungar Creek and hence eastward along Nungar Creek Fire Trail to the intersection with Tantangara Dam Fire Trail.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

The historic items known to be present in the Nungar Creek Fire Trail survey area are presented in Table 29. One unnamed hut site is listed by OEH for the survey area. There are no historical items of State or local significance. The potential heritage items recorded during the fieldwork are described in Table 30.

Table 29 Nungar Creek Fire Trail: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
	5437		644113	6036184	Unnamed hut ruin	No description available This item was not relocated during the survey and is assumed to not be in the project footprint. See below – NSU3/H1	Pastoralism

Table 30 Nungar Creek Fire Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
NSU3/H1	644097	6035989	Unnamed hut ruin GR for site recording is located north of Nungar Creek Trail; no historic evidence was located at this point. GR centre point of site complex; two circular green grassed areas c. 7 m apart; possible hut sites or yard sites; located on western side of lightly wooded knoll. Larger grassed area [c. 23 m (NS) x 26 m (EW)] at 644069.6036010; smaller grassed area [c. 16 m (NS) x 18 m (EW)]; both grassed areas covered on numerous pieces of aged dead timber/trees; small amount of scattered dead timber around perimeter of the smaller grassed area - ? yard; no other fallen timber elsewhere in the vicinity; no other artefacts located on surface; areas mentioned above possibly associated with hut site.	Pastoralism
NSU3/H2	643742	6036120	Old fence line; traverses Nungar Creek trail on Blanket Plain in a N-S orientation. Line of posts; both sides of Nungar Trail; very poor condition; most of the posts are lying on the ground; scraps of wire; one standing post is evident c. 100 m to north. Fence line continues in N-S direction either side of Nungar Fire Trail; wires on include heavy gauge plain wire and old-style sheep netting as well as a strand of barb. Northern most post at 643786. 6036325; standing split post; 121 cm x 20 cm x 12 cm; heavy duty barb wire; one top V notch; 3 bore holes [2 holes closer to top of post and one hole closer to base of post; side notch also evident in post. Southern most post at 643730.6036050; barb, plain and sheep netting; most posts are burnt and lying on ground; evidence of a V notch in top of post [same post design as over at Wallaces Creek Fire Trail fencing]. Post at 643725. 6036096; top V notch holding barb wire; 2 x bore holes in post with bottom	Pastoralism

ID	Easting	Northing	Description	Theme
			hole threaded with a plain wire. Gate bracket located at 643747.6036145. Most likely a gateway on or very near the current Nungar Creek Fire Trail. One large horseshoe located in cleared area from recent road maintenance grading. Most posts lying in original positions in alignment c. 3 m apart. Old fence remnants do provide good indication of alignment and basic materials used and post design.	
NSU4/H1	642899	6036756	Old fence line traverses SU4 across Bullocks Hill Trail in a 60°/240° alignment on west side of and 80°/260° on east side of Trail. Fence clearly continues across Blanket Plain to the ENE. Fence in poor condition. Majority of posts lying on ground with only an occasional standing post remaining. Hardwood split posts with no holes or notching evident; scattered wire – plain and barb some embedded in ground. Standing post at 642899.6036756; standing post at 642883.6036750; fallen post at 642861.6036743; standing post at 642856.6036743; remnant posts continue to the WSW. Round post with 6 plain wires at 642838.6036736; fallen post at 642822.6036731; fallen round post-post hole still visible at 642802.6036728.	Pastoralism

7.2.11 Tantangara Dam Fire Trail

The field survey at Tantangara Dam Fire Trail was conducted in October 2018. The Tantangara Dam Fire Trail survey area has been subject to a reasonably comprehensive field survey. This survey extends east along Tantangara Dam Fire Trail from the junction with Nungar Creek Fire Trail.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is a mix of open grassland and snow gum woodland.

There are no historic items known to be present in the Tantangara Dam Fire Trail Area. The potential heritage items recorded during the fieldwork are described in Table 31.

Table 31 Tantangara Dam Fire Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
TFTSU3/H1	647562	6036525	Old fence line to north of Tantangara Dam FT parallel to an ephemeral drainage line. Fence alignment 90°/270°. Old fence line, some fence posts still standing; posts are fire damaged. Post 1: at 647562.6036525; 136 [high] x 16 x 12 cm two notches cut out on top end of post; plain heavy gauge wire and old sheep netting. Post 2: at 647554.6036521; 72 x 13 x 15 x 11 cm; very poor condition; some sheep netting still attached. Post 3: at 647567.6036516; 92 x 25 x 10 cm; lying on ground; badly fire damaged. Post 4: at 647576.6036519; 77 x 14 x 16 cm; standing post; v shaped notch holding one top plain and one barbed wire; sheep netting. Post 5: 647574.6036518; 97 x 17 x 7 x 12 cm; split post. Three metres between posts 4 and 5. Post 6: at 647368.6036557; lying on ground. Site condition very poor; many posts show signs of fire damage and are no longer standing.	Pastoralism
TFTSU3/H2	647829	6036262	Old metal drums x 2 located on an upper slope south of trail nearby a large rock outcrop. Two rusted 4-gallon drums; one drum cut in half; other half buried in rabbit burrow. Base of drum stamped with 'RHEEM'. Site condition is poor.	Miscellaneous
TFTSU4/H1	648081	6036425	Fence line, east/west alignment, located on top of crest proper before break of slope with a westerly aspect. High level of rock outcropping on crest. Two strands plain wire, barbed wire and sheep netting. All posts are burnt and lying on ground. Post 1: at 648089.6036425 Post 2: at 648073.6036431 [89 x 18 x 16 cm]. Post 3: at 648065.6036431. Post 4: at 648044.6036435. Sections of fence line appears to have a line of local rocks stacked along the baseline of fence; possibly used as a means of rabbit or animal proofing. Site is in poor condition.	Pastoralism

7.2.12 Tantangara Road Transmission Line

The field survey at Tantangara Road Transmission Line was conducted in October 2018. The survey area has been subject to a comprehensive field survey. This survey extends east along Tantangara Road Transmission Line from the junction with the Snowy Mountains Highway, and hence north to Tantangara Dam.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

The historic items previously recorded in the Tantangara Road Transmission Line area are listed in Table 32. There are a number of sites associated related to theme of mining and SMA. There are no historic sites of State or local significance in the Tantangara Road Transmission Line survey area. The potential historic items recorded at during the field surveys are listed in Table 33.

The Tantangara Road Transmission Line survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 32 Tantangara Road Transmission Line: Previously listed historic items.

KHA id.	OEI id.	S170	Easting	Northing	Name	Description	Theme
2592			646860	6029760	Tantangara Township	According to KHA listing: <i>Tantangara Township</i> <i>Current site - Complex/settlement ruin/site</i> <i>Description - Contractors housing settlement for the Tantangara Dam and Tantangara-Eucumbene tunnel projects.</i>	SMA
5039			646615	6025981	Upper Gang Gang Creek Diggings	According to KHA listing: <i>Upper Gang Gang Creek Diggings c1890s</i> <i>Current site - Mine workings (abandoned)</i> <i>Description - Alluvial mine workings along creek. Race-lines and excavated ground. Second site and old tins at 646601E 6025994N.</i>	Mining
5040			646601	6025994	Miners Hut/Camp	According to KHA listing: <i>Miners Hut/Camp c1890s</i> <i>Alternative - Upper Gang Gang Creek</i> <i>Current site - Building ruin/site</i> <i>Description - Miners hut or camp site with old tins.</i>	Mining

Table 33 Tantangara Road Transmission Line: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
TTxSU1/H1	645907	6022855	Remnant fence posts in a north-south alignment; old style ring-lock and collapsed timber posts; fence line traverses SU1 and SU2. The fence is in very poor condition. There is no potential for associated relics.	Pastoralism
TTxSU5/H1	646334	6023741	Two gate posts located on a crest under the transmission line. Both posts are repurposed from old telegraph posts, round, c. 1.4 m high and 25 cm diameter. Different wire has been used on either post; east side has 250 x 200 mm hinge lock sheep netting and 5 strands of wire stapled to post. top wire is a strand of	Pastoralism

ID	Easting	Northing	Description	Theme
			barb secured to a plain gauge wire. The remaining wires are plain. West side of gateway has 6 lines of 8-gauge plain wire with slip knots, barbed wire connected to a top plain wire. Staples holding to gate post. Gate latch on west gate post which also has a stay post. Site condition is fair. There is no potential for associated relics.	
TTxSU9/H1	646297	6024933	Two small road alignments starting from inside SU9 survey area and extending beyond. East alignment runs to c. 1.5 m above west alignment. East c. 30 m in length. Wests approximately 40 m in length. Both roads conjoin at a creek line to form one alignment which appears to cross over. Alignments are c. 3 m wide. Rock outcropping visible on lower [west] road.	Transport
TTxSU9/H2	646413	6025141	SMA midden; beer bottles, glass fragments, porcelain, oyster shells and tin can fragments located in a concentrated area under transmission line on crest.	SMA
TTxSU11/H1	646568	6025991	SMA midden; possibly SMA trash scattered over a 20 m area located directly adjacent to watercourse; artefacts include neck and handle of brown glass bottle, one small brass door knob with square spindle; 2 x ceramic shards [? soup bowl], porcelain piece, moulded rim; tapered brass spigot [possibly originating from a cast iron water fountain tap]. The site area is highly disturbed and has been mechanically levelled and has stockpiles of gravel and soil [local and imported]. There is some potential for associated relics.	SMA
TTxSU12/H2	646568	6026075	Twin drain culvert with concrete cap; crossing a drainage line and part of the transmission line access track; 3 m wide x 2 m long. There is no potential for associated relics.	Transport
TTxSU13/H1	646678	6026644	Potentially a water race.	Uncertain
TTxSU16/H1	646765	6027748	Remnant old fence aligned north northeast. Degraded timber post and wire. Recorded by TK to the east and recorded on the back of SU14/L1 sheet as follows: Old fence to north at 646765.6027748. Drilled split post. Plain wire x 3 and sheep or 'dog' mesh. In good condition this point. North-south orientation, 10 foot spacing. Section c. 40 m long, probably picked up in previous road corridor survey.	Pastoralism

ID	Easting	Northing	Description	Theme
TTxSU30/H1	647358	6031885	Three loose sheets of iron/flattened tin and plain wire scattered over an area of c. 60 m under the transmission line. Plain wire was loose and embedded and some attached to a sheet of tin through holes. One sheet of tin measured as 780 x 2400 mm and has the wire attached and two sheets of tin as 700 x 1800 mm. Site condition is poor. Searched the greater area for further evidence for a possible hut site however none was located at time of survey. All items located on a gently undulating crest south of a drainage line.	Miscellaneous
TTxSU31/H1	647381	6032068	Twin drain culvert with concrete cap using local rock; crossing a drainage line and part of the transmission line access track; 4.4 m wide x 8 m long. There is no potential for associated relics.	Transport
TTxSU32/H1	647418	6032235	Single culvert; 450 mm diameter concrete pipe culvert with cement filled sandbags and a pebble concrete capping; the crossing is 4.2 m wide x 2.5 m long or 9 metres long to end of fill. There is no potential for associated relics.	Transport
TTxSU32/H2	647467	6032512	A water race running in a 130°/310° alignment; travels downslope in northwest direction; the race is c. 2.4 m [including spoil] and c. 50 cm deep. The spoil is located along the southwest margin of the race. The site condition is well preserved. There is no potential for associated relics.	Uncertain
TTxSU37/H1	647923	6033705	The remains of a standing sawn-off twin trunked tree stump with possible board holes. All saw cuts appear to have been created using a chainsaw. The tree stump has been dead for some time and is located on the edge of the cleared area of the transmission line corridor, immediately adjacent to a spring and c. 80 m northwest of Tantangara Road. The circumference of the tree taken at an c. height of 1.2 m above ground is c. 3.7 metres. The taller of the double tree stumps is c. 3.1 m high and the shorter stump c. 2.25 m. There are three rectangular sawn holes located on the eastern side of the stump with two at a height of 1.4 m and one at 1.55 m above ground. Hole one measures 165 (w) x 60 (h) x 100 (d); Hole two measures 210 (w) x 70 (h) x 100 (d); Hole three measures 185 (w) x 60 (h) x 90 (d). There is some fire damage on the base of the stump. The site condition is good. There is no potential for associated relics.	Sawmilling

ID	Easting	Northing	Description	Theme
TTxSU38/H1	648085	6033777	The remains of an old fence line aligned 100°/280° constructed of split posts with some old sheep netting, heavy gauge plain wire and barbed wire. The fence posts are as follows: Post 1 is located at 648107.6033769 it is in poor condition and lying on the ground. Post 2 is located at 648079.6033777 it is in poor condition and lying on the ground. Post 3 is located at 648079.6033787 condition of the split post is poor, leaning over but still standing. The post measures 102 x 21 x 7 cm. all posts are fire damaged. A bundle of wire and netting is located adjacent to fence line as area scattered loose bits of wire. The overall site condition is poor. There is no potential for associated relics.	Pastoralism
TTxSU38/H2	648395	6033936	A single culvert located along the transmission line access track part of a drainage line crossing. The culvert consists of one concrete drainpipe c. 50 cm diameter and is 3.6 m wide x 2.5 m long. Local stone concreted around pipe and capped with coarse concrete render.	Transport
TTxSU39/H1	648751	6034500	Remains of old fence line traversing a wide undulating valley aligned 160°/340°. Fence posts are lying on the ground and are in very poor condition. A fence repair has been undertaken using very soft thick wire, possibly a type of electrical wire. The fence posts are as follows: Post 1 located at 648756.6034450 post is in very poor condition and has one bore hole threaded with plain wire. Post 2 located at 648755.6034444 very poor condition. Post 3 located at 648758.6034426 post is in very poor condition and has four plain wires. Post 4 located at 648752.6034484 a round post in very poor condition. Post 5 located at 648749.6034487 a round post in very poor condition. Post 6 648747.6034513 measures 120 x 27 x 11 cm, 5 bored holes, no wire is threaded through the top bore hole and the remaining four have heavy gauge plain wire. The overall site condition is very poor. There is no potential for associated relics.	Pastoralism

The Tantangara SMA camp sites have been recorded in detail and described below:

Nungar Camp, Tantangara - The camp site is now heavily vegetated with eucalyptus, shrub and grass regrowth. Observations cited refer primarily to a survey area flanking Tantangara Road with a corridor approx. 40m wide either side of the road. The complex is located primarily on the eastern side of Tantangara Road and is defined as falling within GRs 647345. 6029672 (NW corner), 647418. 6029547 (NE corner), 647019. 6029351 (SW corner) and 647249. 6029145 (SE corner); in landscape terms the camp occupies the lower reaches of a basically south to north trending spur feature and adjacent flat overlooking the Nungar Creek valley. The camp site has been dismantled with all standing structures and most materials removed. Extant camp remnants comprise earthworks/landscape modification with some sub-surface infrastructure and occasional fragmentary scatters or exposures of vestigial basal structure and/or artefacts. Primary archaeological components include dirt access roads, levelled surfaces, earth building and compound platforming, terracing, drainage features (open and sub-surface) and a gravel quarry. The impression gained is that the current routes of Schofields Trail and the unmarked dirt track that intersects with Tantangara Road at 647036. 6029370 are consistent with the township access routes and primary internal demarcation lines.

Three general site zones are apparent adjacent to Tantangara Road: 1) a 'northern' zone falling roughly between Nungar Creek and Schofields Trail. This section is characterised by two 1 m wide x 80 cm deep drainage culverts extending from the edges of the township to the boggy creek valley bottom terrain (647397. 6029722 to 647350. 6029641 with a parallel feature approximately 20 m to the east), a series of twelve large (30 cm x 30 cm) postholes 3 m from and paralleling Tantangara Road at 35/215 degrees (647345. 6029669 to 647302. 6029631), an 'east-west' trending raised earth platform feature (probably an access road) at 647296. 6029628 leading to an artificially levelled and platformed area directly below the township at c. 647418.6029547 (possible compound and hut setting external to the dwelling area); 2) a zone exhibiting extensive terracing of the spur side between Schofields Trail at 647178. 6029522 and an unmarked dirt track at c. 647070. 6029395. The primary forms of evidence in this area comprise a building platform approx. 12m long x 4m wide at 647178. 6029500 and c. 10 m from Tantangara Road (an associated sewage sump and surface scatter of broken sewage pipe, ceramic, glass, iron sheet and asbestos fragments occurs at 647181. 6029501 with reinforced concrete, sewer pipe and an iron drum partially embedded at 647174. 6029497), a shrubby, overgrown area directly to the south and fronting Tantangara Road that displays some remnant cut and fill terracing and earth pushes with occasional surface fragments of reinforced concrete and imported gravel ballast, and a substantial building platform/terrace c. 50 m long x 15 m wide at 647070. 6029395 to 647117. 6029433 angled at 225/45 degrees orientation with glazed sewer pipe exposed in the roots of a dead and fallen tree at 647102. 6029421 (adjacent on surface also some concrete

fragments, rusted iron plate/sheet and an aluminium codeine phosphate pill tube). Sporadic evidence of upslope replication of this landscape modification is apparent in the heavily overgrown terrain directly to the east; and 3) a zone exhibiting more concise building platforms in the terrain directly to the south of the unmarked dirt track at 647036.6029370 and to the north of a minor drainage line, including a gravel-based 30 m long x 15 m wide building platform c. 25 m from Tantangara Road at 647064. 6029357 and a similar platform with adjacent intact but almost completely obscured sewage sump at 647081. 6029338. Several terraced features are apparent in the now forested terrain directly upslope from this point. On the western side of Tantangara Road occur some remnant camp infrastructure items including an iron sheet and heavy timber post lined pit c. 4 m long x 2.5 m wide x 1.2 m deep directly fronting the road at 647205. 6029565, and at 647170. 6029560 a 20 cm diameter terracotta sewer pipeline set in an excavated ditch running downslope at orientation 340/160 degrees to 647173. 6029538 draining into the creek valley below.

Tantangara Township for SMA and Utah married personnel - Located on the western side of the Nungar Creek valley, the township complex occupies a series of spur tops serviced directly by the Nungar Creek Fire Trail between GRs 646900. 6029400 and 646810. 6029900. The camp site has been dismantled with all standing structures and most materials removed. Extant camp remnants primarily comprise earthworks (including roading, platforming and terracing) drainage features (both open and enclosed/sub-surface) and occasional scatters of artefacts and/or fragmentary structural material. The camp may be divided into two general components: a 'southern' zone on the sloping, now well vegetated spur crest south of the drainage line at 646800. 6029650 and primarily upslope ('west') of the Nungar Creek Fire Trail; and a 'northern' zone occupying broad, gentle spur crests to the north of the drainage line at 646800. 6029650 and downslope ('east') of the fire trail.

The 'southern' zone includes a well formed heavily gravelled vehicle track approx. 3m wide that intersects with the Nungar Creek Fire Trail at 646754. 6029604 and accesses the spur crest oriented c. 10/190 degrees, effectively servicing a complex of earthen building platforms with a general aspect to the ENE and overlooking the creek valley. Identified components include (but are not limited to): at 646773. 6029426 a building platform c. 12 m x 5 m well cut into the slope and oriented 20/200 degrees with a glazed ceramic sewer pipe at one corner; at 646783. 6029435 a building platform c. 23 m x 6 m oriented 10/190 degrees, cut into the slope with a well-defined downslope push, remnant fragments of reinforced concrete exposed on surface; at 646786. 6029478 a stone outlined platform/structure of indeterminant role, c. 10 m x 4 m with a large mature eucalyptus tree growing at one edge. An additional platform occurs directly upslope with a stone-lined corner at 646770. 6029482, c. 12 m x 4 m and oriented 320/140 degrees, occasional stones apparent in association with edges and boundary; at 646779. 6029467 a 'hearth-like' stone construct 1.6 m x 1.9 m exhibiting a sunken centre; at 646839. 6029447 a rectangular

pit with a large downslope mound, c. 2.8 m long x 1 m wide x c. 40 cm deep, a possible drainage ditch occurs directly below oriented 250/70 degrees and c. 20 m long x 40 cm wide; at 646847. 6029446 a largely obscured concrete sewer sump with intact lid at the head of a drainage ditch; at 646853. 6029462 a cut bank c. 15 m long x 2 m wide; at 646856. 6029478 a contouring linear cutting possibly an extension of the aforementioned cut, c. 40 m long with a concealed cylindrical concrete sewer sump at 646870. 6029491; at 646869. 6029503 a platform c. 20 m long x 5 m wide formed from heavy gravel and oriented at 10/190 degrees; at 646876. 6029524 a building platform c. 12 m long x 6 m wide oriented 290/110 degrees, an aluminium pot is exposed at one end; at 646875. 6029558 a platform min 25 m long x 4 m wide and oriented 100/280 degrees, heavy gravel is incorporated into the cut base, a blue ceramic insulator is exposed on the surface (this feature is c. 6 m upslope from the Nungar Creek Fire Trail). A hearth-like stone structure 1.8 m x 1.1 m rectangular enclosure form occurs at the upslope edge at 646888. 6029541; at 646841. 6029564 a platform c. 30 m long x 6 m wide oriented 110/290 degrees, a possible extension of the aforementioned platform; at 646900. 6029556 a 19.5 cm diameter flanged glazed ceramic sewer pipe set upright at the top of the fire trail cutting, the corner of a concrete box sump protrudes from the soil next to the pipe; two features occur on the downslope side of the fire trail: at 646930. 6029549 a drainage ditch-oriented downslope at 55/235 degrees, c. 50 m long x 40 cm wide, potentially contains sub-surface sewer pipe, runs through the overhead powerline corridor; at 6469915. 6029568 – 646900. 6029576 a possible remnant terrace or platform feature c. 15 m long x 5 m wide, partially impacted by the current fire trail route.

The 'northern' zone incorporates open, grassy terrain directly to the east of the Nungar Creek Fire Trail between GRs 646801. 6029726 and 646807. 6029864. It comprises a basic street layout (based on well-formed gravelled road surfaces) with vestigial basal flanking infrastructure, the remains of the town sewerage system and traces of a small number of outlying buildings. The main township streetscape is defined by four corners at 646801. 6029726 (SW corner), 646884. 6029694 (SE corner), 646807. 6029864 (NW corner) and 646903. 6029839 (NE corner). A north-south trending central street extending from 646842. 6029719 – 646848. 6029859 effectively divides the township into east and west sections. Vestigial building platforms and occasional surface instances of associated infrastructure occur throughout the inside of the township road perimeter, with particularly well-defined cut platforms apparent in the far north of the complex flanking the intersection at 646848. 6029859, and raised gravel drive/platform features either side of the internal road at 646855. 6029817. Building platforms and house yards are also apparent flanking the outside of the main road system along the township's southern and eastern sides (i.e. south of the line 646801. 6029726 – 646884. 6029697 and east of the line 646884. 6029697 – 646903. 6029839). Some remnant infrastructure associated with servicing these buildings is evidenced at 646914. 6029719 (a sewer sump), 646914. 6029755 (base of a power pole with extruding insulated coaxial

cable), 646916. 6029806 (a power pole posthole) and 646913. 6029818 (a partially obscured sewer sump). A west to east draining sewer pipeline roughly central to town and evidenced by ditching and fragments of concrete and pipe exits the township at 646893. 6029750 and continues downslope to a reinforced concrete box section and cylindrical trap on the break of slope at 646923. 6029748. A linear ditch impression indicative of a buried pipeline continues downslope from this point for approximately 100m through the overhead powerline corridor to twin sewage tanks at 647004. 6029687. These constructs comprise two open iron sheet and timber lined pits c. 8 m x 2 m x 90 cm deep set in an earth mound c. 27 m x 9 m. Reinforced concrete 29 cm diameter pipe is exposed in the uppermost pit. The surrounding area has been modified by mechanical scraping and includes contour banking and ditching below the tanks with a possible pipe outlet at 647036. 6029673. The remains of two buildings external to the main township zone (and apparent on the 1959 SMA photograph) are also apparent to the NNW of the sewage plant: at 646988. 6029745 a levelled area and raised earth and gravel platform c. 14 m x 6 m x 40 cm high oriented 180/0 degrees and c. 30 m to the ESE of the overhead powerline corridor, with a connecting dirt road extending to the township's north-east corner at 646903. 6029839; and at 646953. 6029884 the likely platform for a small hut c. 5 m x 4 m with surface occurrences of window and bottle glass, c. 10 m west of the overhead powerline corridor.

On the drainage line to the north east of the township area at 646989. 6029930 is an old timber bridge c. 3 m long x 2.5 m wide, the span composed of beams and sleepers, with three 9 cm x 5 cm x 1.5 m tall milled upright posts defining the corners. The crossing has a steep approach from the south, with a possible raised earth ramp c. 2 m wide connecting from the north. No associated graded track is apparent. The bridge is c. 15 m downstream from the overhead powerline corridor and appears to provide access to the pad for a powerline structure directly to the north-west. It is possible that the bridge appears indistinctly on the 1959 SMA photograph of the township.

7.2.13 Schofields Fire Trail

The field survey at Schofields Fire Trail was conducted in November 2018. The survey area has been subject to a comprehensive field survey. This survey extends from the junction with Tantangara Road, east to Schofields Hut and beyond.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

The historic items previously recorded in the Schofields Fire Trail area are listed in Table 34. There are a number of sites associated related to theme of pastoralism one of which is of local significance (s170). The potential historic items recorded at during the field surveys are listed in Table 35.

The Schofields Fire Trail survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 34 Schofields Fire Trail: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
2591			647550	6029470	Nungar Construction Camp	According to KHA listing: <i>Nungar Construction Camp</i> <i>Alternative - (Tantangara Single Mens Quarters)</i> <i>Current Site - Complex/settlement ruin/site</i> <i>Description - Contractors barracks for single men working on the Tantangara Dam and Tantangara-Eucumbene tunnel projects.</i> See below - SSU1/H1	SMA
252	1832	5038	651274	6031113	Schofields Hut (KHA); Schofields Hut and yards (OEH)	According to KHA listing: <i>Schofields hut c1943</i> <i>Alternative - Nungar</i> <i>Current site - Building(s)</i> <i>Description - Corrugated iron stockmen's hut. 1 room, 6.6 x 2.7m. Built by Stan & Wally Schofield from secondhand materials. Fireplace made from steel tank, large 16-pane window.</i> See below - SSU15/H1	Pastoralism
4976	5039		651232 (KHA) 651513 (OEH)	6031222 (KHA) 6031084 (OEH)	Sheep yards (KHA); Schofields Yards (OEH)	According to KHA listing: <i>Sheep yards C1943-70</i> <i>Alternative - (Schofields)</i> <i>Current site - Yards ruin/site</i> <i>Description - Site of sheep yards; round timber posts, wire, some netting, steel gate (Sunshine). Built by Schofield.</i>	Pastoralism

Table 35 Schofields Fire Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
SSU1/H1	647325	6029474	Remains of SMA Tantangara camp located at intersection of Tantangara Road and Schofields Fire Trail. Settlement remnants – mainly ceramic sewer pipes, asbestos sheet remnants, corrugated iron scatter. Some earthworks in area including terracing. Broken pipe and building materials being exposed by tree fall and wombat digging at west end of survey unit. Intact sewer pipe inset on southern side of vehicle track in cutting, indicative of alignment of pipe and role of existing track as camp infrastructure. Plentiful broken bottle glass in vicinity may or may not be related. Broken glass, ceramic [crookery] and utensil [dessert spoon] upslope on old track at 647366.6029387. High potential for subsurface artefacts. Site condition is vestigial.	SMA
SSU2/H1	647490	6029432	Series of shallow pits dug into slope/hill side. 647490.6029432 c. 3 x 2 m x 60 cm deep [same dimensions for all pits –roughly consistent] 647495.6029442 east side of vehicle track; partially cut into by grader 647504.6029452 east side of vehicle track; partially cut into by grade 647488.6029450 west side of vehicle track; partially impacted/edge of grade 647537. 6029472 east side of track [upslope] near rollover. Old vehicle track running upslope. Appears to be twin deep wheel ruts embedded. c. 3 m wide and 30 - 40 cm deep. Extends from 647574.6029514 [pre-existing very early grade; possible bridle track] On west side of Schofields Track. Culvert and drain at 647597.6029505 concrete pipe 53 cm diameter set in downslope stone-faced [dry wall] culvert wall; intake on upslope edge of track with cut and banked earth drain upslope [south] side of track [runs from 647602.6029503] to spur crest and continues in south-east alignment across slope and into site SU3/H1	Miscellaneous
SSU3/H1	647708	6029506	Settlement site – zone of graded/alterd landscape surface on near level spur crest. Pile of graded earth at 647732.6029545 with incorporated artefacts [broken bottles, steel pipe/rods, crockery ceramics, iron sheeting, nails, asbestos board fragments, structural timber, sewer pipe fragments. Bottles date to 1954/58; located north of vehicle track. Levelled/scalped area [c. 60 x 40 m] north of Schofields Trail. Earthworks to south of track [levelling, ditching] and pushed and burnt material - possibly associated. There is potential for associated relics. Vehicle track cutting	SMA

ID	Easting	Northing	Description	Theme
			commences at 647716.6029452 and runs across slope for c. 80 m in rough south south-easterly orientation. Old track running below [north side] of current track, with cut appears to peter out but well embedded horse track follows and continues along contour – is this the old track? Possible continuation of old track re-emerges @ approximately 648022.6029307 in SU4. Also branches to creek.	
SSU4/H1	647771	6029350	Culverts x 2. Culvert #1: 647771.6029350 intake on south side of track and outlet to north. Concrete pipe approximately 65cm diameter and 5cm thick. Set in drystone walled face c.3.5 m wide and c.1 m high [c. 6 courses]. Culvert #2: c. 30 m along track to east at 647794.6029335. Most work apparent on intake upslope side [largely obscured concrete pipe set-in dry-stone walling] c. 4 m long and 1.5 m high. Downslope/outlet side indistinct and obscured by earth and vegetation.	Transport
SSU4/H2	647864	6029289	Drainage ditch contouring [roughly] middle slope and running roughly west/east. c. 2.5 m wide x 60 - 100 cm deep with well-defined upslope cut and downslope push. Commences at 647864.6029289 runs to culvert at 647996.6029289. Trees growing in feature provides some indication of minimum age: tree trunk diameter 45 cm.	Miscellaneous
SSU4/H3	648022	6029306	Remnant of original/old track now hard to define below current Schofields Track. Commences roughly at 648022.6029306 and runs east/west below current track and with well-beaten horse track following remnant surface. Becomes better-defined at 648072.6029323, possibly representative of 'whole' form: approximately 4 metres wide with upslope cut and c. 1 m deep and downslope bund/push. Terminates abruptly at creek gully at 648121.6029339. No evidence of bridge/causeway. There is no potential for associated relics.	Transport
SSU5/H1	648137	6029317	Twin culverts/causeway and survey marker. Causeway across creek gully with twin streams and confluence just below [north of] road. Two stone-lined culverts at 648125.6029323 [45 cm diameter concrete pipe set in drystone facing/wall c. 3 m wide x 1.8 m high] and 648147.6029331 [1.5 m diameter concrete pipe set in drystone wall c. 4 m wide and 1.7 m high]. Survey Marker at 648146.6029297. Survey mark no. 786476, SMH-EA. Brass marker with datum set in tapered square concrete base. Two old wood posts c. 60 cm x 45 cm high [35 cm thick x 75 cm wide], taller with single nail protruding, set in concrete adjacent to mark. Upslope near rocky outcrop	Transport

ID	Easting	Northing	Description	Theme
			c. 20 m from Schofields Trail. Short length of 15 mm braided steel cable with tight knot protruding from earth at 648142.6029309 c.6 m upslope from track.	
SSU6/H1	648267	6029592	Culvert/pipe. Rubble stone construct [no real walling] overlying corrugated iron/sheet rolled and pinned pipe 50 cm diameter. Pipe is formed from longitudinal curved halves that are notch-interlocked along the pipe length and pinned [at extremity]. Pipe protrudes at outlet side for approximately 70 cm. Pipe protrusion is segmented [ie. at least two lengths of pipe are sleeved/fitted to create length]. Another pipe culvert of same materials at 648385.6029713.	Transport
SSU8/H1	648794	6029733	Old fence. Trending roughly N-S [172/352°]. Two upright posts remaining – hardwood strainer post at 648794.60297433 adjacent to road. 148 cm high; 25 cm diameter with two timber bearer posts, wiggly [crimped] dropper, three strands of plain gauge wire with sheep mesh. To north a series of fallen posts at c. 5 m intervals. On opposite [south] of road a fallen post [strainer] adjacent to track with post hole at 5 m south. Fallen posts and remnant wire continue south for c. 30 m to standing post at 648791.6029687. Fallen posts continue south into adjoining paddock. Hardwood billet split posts. Extends through current study corridor and into adjacent zones.	Pastoralism
SSU8/H2 (Plate 25)	648747	6029678	Trig point. Fallen; semi-articulated. Timber and corrugated iron structure, now collapsed. Quadra-pedal design with legs set in low stone piles. Wooden milled posts 3.8 m long with variable widths/thicknesses around 70 – 90 mm x 65 mm. Bolted to cross struts and some 6-inch nails embedded. Red/white painted central post with four veined corrugated iron head structure. Central post 2.5 m long. c. 2 m maximum spacing between footings. 17.5 cm brass rod insert in post end, head structure [would have been the highest point on the structure].	SMA
SSU15/H1 (Plate 26)	651287	6031120	Schofields Hut site complex; currently in use for recreational camp area; hut is in excellent condition; recently renovated; corrugated iron and timber construction. Detailed recording to be completed at later date.	Pastoralism
SSU15/H2	651916	6031427	Remnants of old fence line located in a saddle of a very gently undulating crest; possibly associated with Schofields Hut pastoral complex. Fence aligned 70°/250°.	Pastoralism

ID	Easting	Northing	Description	Theme
			Post 1: at 651916.6031427; half round post in ground; flat part of post faces north-east; 1 m [high] x 23 cm x 11 cm; crimped droppers x 2; 2 plain wires and 1 barbed wire. None of the wires are still attached to post. Post 2: at 651923.6031427; half round post in ground-just; 53 [high] x 21.5 x 12cm; poor condition. Post 3: half round; post and wires; 86 [high] x 23 x 15cm. Post 4: at 651966.6031434; very poor condition.	
SSU16/H1	651869	6031958	Old road; located at c. 15 m above major running creek and east of Circuits Hut Fire Trail. Cut and benched; bank height south-west side c. 50 – 100 cm; road width 3.5 m; road aligned 130°/310°. Appears to join up with existing track at 651846.6032074 The overall site condition is fair. There is no potential for associated relics.	Transport
SSU17/H1	651861	6032384	Remnant old road; probably same road as SU16/H1. Located c. 10 - 15 m east of existing vehicle track and c. 50 m above Gulf Plain Creek. Road is aligned 0°/180°, 3 m wide, cut and benched; bank 50 cm high. Spoil on east margin and 1 m wide x 0.2 m high. Road continues in a northerly direction at 651869.6032436 following and parallel to creek. There is no potential for associated relics.	Transport
SSU17/H2	651874	6032772	Continuation of the road as noted in SU16/H1 and SU17/H1. Old road aligned 10°/190°. Old road continues to run parallel to the creek following the contour. Road crosses a drainage line. The drainage line is not wide nor deep and no modification of the crossing was observed. The old road continues and eventually joins the existing road alignment. The site condition of this section of the old road is very poor. There is no potential for associated relics.	Transport
SSU19/H1	652038	6033140	2 x culverts c. 20 m apart set in fast flowing watercourse. Culvert #1: 652038.6033140. Steel drainpipe with cobble and soil capping; c. 4 m wide; pipe 10 mm thick rim and is c. 30 cm in diameter. Culvert #2: 652047.6033114 Appears same as culvert 1; dense thick shrub and tussock hindering view. Site condition is good. There is no potential for associated relics.	Transport
SSU22/H1	652148	6033622	SMA survey marker located 2 m south west of Circuits Hut Trail. Square concrete post painted yellow; 81 cm high x 13 cm x 12.5 cm. The top edge is bevelled. A rectangular section is inset in north-western side of post. A piece of concrete has fallen off the side of the marker exposing steel reinforcing bars. Part of the preformed	SMA

ID	Easting	Northing	Description	Theme
			post construction. The fallen off piece is lying beside the marker. Site condition is good.	
SSU22/H2	652255	6034113	Old fence line; aligned 0°/180°; located 5 - 10 m east of Circuits Hut Trail. Post 1: 119 [high] x 14 x 14 x 22 cm; split post; standing; 5 plain wires attached to post with fencing staples; 1 barbed wire not attached; wire appears modern; crimped wire droppers used along fence line. Post 2: at 652258.6034122; twelve m from post 1; 108 x 20 x 8 cm; split half small round post. Post 3: round post on ground pushed up into spoil pile; possibly impacted during recent road maintenance. Post 4: 652278.6034236 round post lying on ground; 131 cm high x 27 cm diameter; 10 wires [9 plain and 1 barbed] wrapped around the post; poor condition. Post 5: at 652282.6034254 very poor condition; lying on ground; c. 13 m north of Post 4. Post 6: at 652298.6034358; 126 cm high x 21 x 13 cm split round post; 5 staples; 5 plain wires; 1 barbed wire. Fence components are mostly in poor condition. There is no potential for associated relics.	Pastoralism
SSU24/H1	653316	6030153	Old fence line, aligned 20°/200°, crossing Nungar Plain and adjacent to Nungar Creek. Posts 1 to 3 are located on the north side of Circuits Hut trail and post 4 is on the southern side. Six plain wires and one barbed; old style sheep netting with crimped droppers at intervals of c. 2 m apart between posts. Fence staples used to attach wires to posts. Overall fence in good condition and extends further to the north and south. Recorded section of fence within SU. Post 1: 653316. 6030153 153 [high] x 15 cm; round post; good condition. Post 2: 653322.6030159 lying down; very poor condition; 130 [h] x 8cm. Post 3: split post; 155 [h] x 14 x 19 x 9 cm. Post 4: 653309.6030138 on ground in poor condition; 140 [h] x 21 cm.	Pastoralism
SSU28/H1	656395	6029776	Old track/vehicle route located on Boundary Fire Trail. Dozed [cut and pushed] trail running 315°/135° and cut by current fire trail at 656395.6029776. Dirt track heavily overgrown with grass, shrubs and trees. c. 3 m wide, upslope cut c. 30 cm deep with well-defined downslope push/bund and flat surface. Crosses track and extends into forest on both sides.	Transport



Plate 24 Schofields Fire Trail: SSU8/H2 SMA trig; looking 260°.



Plate 25 Schofields Fire Trail: SSU15/H1 Schofields Hut; looking 210°.

7.2.14 Circuits Hut Fire Trail

The field survey at Circuits Hut Fire Trail was conducted in October 2018. The survey area has been subject to a comprehensive field survey. This survey extends from the junction with Tantangara Road below the dam wall, south to Circuits Hut and hence eastward along Gulf Creek Fire Trail.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

There are no historic items previously recorded in the Circuits Hut Fire Trail area. There are a number of sites associated with Circuits Hut and related to theme of pastoralism near to but outside the survey area. Several sites are of local significance (s170). The potential historic items recorded at during the field surveys are listed in Table 36.

The Circuits Hut Fire Trail survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 36 Circuits Hut Fire Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
CHSU2/H1	651849	6036646	SMA concrete survey post; preformed; reinforced; bevelled edges; identifier missing; located c. 35 cm from edge of vehicle track on a crest; northside of post in poor to moderate condition; post leaning; small rectangle recesses set in concrete post on south and east side only; paint almost completely worn off the entire post. Terracotta pipe set in concrete on northside of post is expose. In the centre of the pipe is an embedded star picket, a datum set at same height as terracotta. The site is in fair to good condition. There is no potential for associated relics.	SMA
CHSU3/H1	652083	6036168	Telegraph pole located c. 11 m north north-west of Circuits Hut Fire Trail. Telegraph pole is timber; ceramic insulator intact; iron nails; pole lying beside post hole in an east north-easterly orientation; pole c. 3 m long x 15 cm wide. The site is in fair to good condition. There is no potential for associated relics.	Miscellaneous
CHSU3/H2	652365	6034634	Old fence line; east-west alignment; located c. 25 - 30 m south of Gulf Creek Fire Trail; a stand of exotic Hawthorn trees is directly adjacent to fence line. Fence is constructed using split timber posts. Two posts remain upright and the remainder fallen or only post holes remaining. Length of extant fence line c. 100 m with barbed and plain wire attached in places. The fence is in very poor condition. There is no potential for associated relics.	Pastoralism
CHSU9/H1	653495	6034444	Old fence line located c. 15 m north of Gulf Creek FT. Fence using four different types of wire and crimped droppers. The fence is comprised of old rusted barbed wire, a single strand of plain wire and old-style sheep netting. Occasional rusted heavy-duty wire [c. 1 cm diameter] crimped droppers remaining. Fence is connected by unformed post, lying down with a forked branch. Fence continues both sides of vehicle track for c. 3 m.	Pastoralism
CHSU12/H1	653992	6034339	An old fence line; a row of three visible fence posts, two upright and one lying down. The fence line travels south-east for c. 300 m, then turns to the north-east. The fence is possible associated with a nearby known hut site. Fence posts used are split in half round posts. One post has an iron hook still attached. One post possibly part of a gate assembly. The fence is in very poor condition.	Pastoralism

7.2.15 Pockets Saddle Road

The field survey at Pockets Saddle Road was conducted in October 2018. The survey area has been subject to a comprehensive field survey. This survey extends from the junction with Tantangara Road below the dam wall, north to Currango.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

The historic items previously recorded in the Pockets Saddle Road area are listed in Table 37. These are listed by the Kosciusko Huts Association and OEH. The sites are all associated with Currango and related to theme of pastoralism. Several sites are of local significance (s170). The potential historic items recorded at during the field surveys are listed in Table 38

The Pockets Saddle Road survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 37 Pockets Saddle Road: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
5096			653460	6044023	Currango Gate #2	According to KHA listing: <i>Currango Gate #2 c1920s</i> <i>Alternative - (Currango)</i> <i>Current site - Structure ruin/site</i> <i>Description - Remains of timber gate frame and some iron parts incl latch, all on the ground, partly covered by grass etc. Bits of fencing and a few posts around.</i>	Pastoralism
5095			653428	6044464	Currango Gate #1	According to KHA listing: <i>Currango Gate #1 c1920s</i> <i>Alternative - (Currango)</i> <i>Current site - Structure</i> <i>Description - Wrought iron gate on Port Phillip Trail. Snowgum to which it was attached has grown around it and fixed it in open position.</i>	Pastoralism
2559			653100	6044955	Arboretum	According to KHA listing: <i>Arboretum</i> <i>Alternative - (Currango)</i> <i>Current site - Planting</i> <i>Description - Remnants of c1930 trial plantings of commercial softwoods.</i>	Pastoralism
2558		4882	653095	6045100	Howard Florey Institute Hut and Pens (KHA); Howard Florey	According to KHA listing: <i>Howard Florey Institute hut and pens c1972-85</i> <i>Current site - Building ruin/site</i> <i>Description - Site of c1980 prefabricated shed used to store equipment for scientific experiments on rabbits. Wire rabbit pens along north side of pines (since removed).</i>	Pastoralism

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
					Institute Store Shed Ruin; Outbuildings precinct (O108) [OEH]	SHR Listed	
5112			652968	6045209	Shed near Howard Florey	According to KHA listing: <i>Shed near Howard Florey Alternative - (Currango)</i>	Pastoralism

Table 38 Pockets Saddle Road: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
PSSU3/H1	650512	6038383	Survey marker; located above road cutting c. 3 m from road edge, SE side Pockets Saddle Road. Reinforced concrete post; yellow painter, 102 cm high, square cross section [12.5 cm x 12.5 cm] chamfered edges, two rectangular indents on upper end of post measuring c. 16 cm x 4.5 cm. residual lettering/numbering on downslope [road side] face 'R1087...' and 'SURVEY CONTROL STATION' on NE face.	SMA
PSSU3/H2	651088	6038932	SURVEY CONTROL STATION; probably SMA survey – infrastructure; concrete post; 82 cm high; square cross section - 12.5 cm x 12.5 cm; proforma shape and configuration; at upslope side of road at edge of road; yellow painted with residual writing. Only one paint colour. At c. 45 cm from base of post upslope what looks like a datum or benchmark [inset ceramic pipe 170 mm outside diameter with stone on top. Site area is regrowth snow gum woodland with occasional stumps.	SMA
PSSU3/H3	651436	6039619	SURVEY CONTROL STATION; probably SMA survey – infrastructure; concrete post; 84 cm high; square cross section - 12.5 cm x 12.5 cm; proforma shape and configuration; at upslope side of road at edge of road; yellow painted	SMA

ID	Easting	Northing	Description	Theme
			with very indistinct residual lettering/numbering. Only one paint colour. Located on east side of road. Upslope c. 55 cm of marker base is well embedded small boulder – may be covering benchmark/ceramic pipe.	
PSSU4/H1	651410	6040034	Old fence line; aligned 320°/140°, located on a crest on the east side of road c. 10 m. Corner bogan gate @ 651468.6039972. Fence continuing roughly E-W. Wooden strainer post and wire – round post 1.25 m high x 37 cm diameter; axe cut stay indent on north side; remnant hinge lock, plain and single top barb wire. Appears to run in a NW-SE orientation. On south side of road, fence continues with occasional wooden posts, some still standing, in a 120°/300° alignment with what looks like old road. There is no potential for associated relics.	Pastoralism
PSSU4/H2	651475	6040418	SURVEY CONTROL STATION; probably SMA survey – infrastructure; concrete post; located on west side of crest on east side of road. Marker is 90 cm high from base; square cross section - 12.5 cm x 12.5 cm; proforma shape and configuration; virtually no vestigial lettering or numbers. At c. 50 cm from base of post upslope is a small pile of rock – almost certainly on top of a datum or benchmark.	SMA
PSSU4/H3	652172	6041194	SURVEY CONTROL STATION; probably SMA survey – infrastructure; concrete post; located immediately adjacent to road; east side of road. Marker is 85 cm high from base; square cross section - 12.5 cm x 12.5 cm; proforma shape and configuration; well preserved 'SURVEY CONTROL STATION' writing. Adjacent 3 m to south is a split wood fence post [round post split in half] possibly drilled before being split; 122 cm x 18 cm x 10 cm; 4 drilled holes; fence line oriented NW-SE; no wire apparent or any other posts.	SMA
PSSU4/H4	652649	6041661	SURVEY CONTROL STATION; probably SMA survey – infrastructure; concrete post; located immediately adjacent to road; east side of road. Marker is 70 cm high from base; square cross section - 12.5 cm x 12.5 cm; proforma shape and configuration. Reinforced steel rods exposed as base and to NE c. 10 cm a plastic capped benchmark/datum dated March 1989.	Miscellaneous

ID	Easting	Northing	Description	Theme
PSSU4/H5	653245	6042124	Old fence line; located on crest; SE-NW orientation; fence crosses road. Hardwood split posts, 5 bore holes threaded with plain wire, spaced c. 3 m apart. Fence with netting, plain wire with single barb at top. Plain wire is 3 - 4 mm thick - heavy gauge. c. 20 m from road, upright strainer with two stay posts and has a second fence extending 210°/30°..	Pastoralism
PSSU4/H6	653354	6042202	SURVEY CONTROL STATION; probably SMA survey – infrastructure; concrete post; 80 cm high; square cross section - 12.5 cm x 12.5 cm; proforma shape and configuration; at upslope side of road at edge of road; painted yellow - faded with vestigial numbering on west side 'R1081' . Only one paint colour. Bevelled edges and two rectangular inset forms on two faces, each 15.5 cm x 4.5 cm. Faces NOT aligned to cardinal points.	SMA

7.2.16 Port Phillip Trail

The field survey at Port Phillip Trail was conducted in December 2017. The survey area has been subject to a reasonably comprehensive field survey. This survey extends from the junction with Long Plain Road, eastward to Tantangara Dam.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

The historic items previously recorded in the Port Phillip Trail area are listed in Table 39. These are listed by the Kosciusko Huts Association and OEH. The sites are mostly related to theme of pastoralism. There are no sites of State or local significance present in the survey area. The potential historic items recorded at during the field surveys are listed in Table 40.

The Port Phillip Trail survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 39 Port Phillip Trail: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
5081			650155	6045430	Salt Lick (?)	According to KHA listing: <i>Salt lick (?) c1940s</i> <i>Current site - Landform/ earthwork</i> <i>Description - Possible site of salt lick (rock salt for stock) shown on 1944 air photos.</i>	Pastoralism
5072			648844	6045464	Well	According to KHA listing: <i>Well c1920-70</i> <i>Alternative - (Australian Estates Cattle Yards, Big Yards)</i> <i>Current site - Dam (small) or well</i> <i>Description - Excavated well just south of cattle.</i>	Pastoralism
5079			648940	6045440	Fenced Paddock	According to KHA listing: <i>Fenced paddock 1882-1900s</i> <i>Alternative - (Sidebothams)</i> <i>Current site - Yards ruin/site</i> <i>Description - Site of circular fenced paddock enclosure built by John Sidebotham in 1882. Probably timber post and rail. Survey plan suggests 300-400m diameter, centred on (later) Aust Est Cattleyards.</i>	Pastoralism
2562			647030	6046968	McCauleys Hut #1	According to KHA listing: <i>McCauleys Hut #1 c1943-75</i> <i>Alternative - McCauleys Camp</i> <i>Current site - Building ruin/site</i> <i>Description - Site of one-room stockmens hut ~5 x 3m, fireplace ~ 1 x 1m. Iron & timber remains, beer bottles from 1962-68, wire made toasting fork. Possible site of earlier hut.</i>	Pastoralism
5083			647077	6046937	McCauleys Hut #2	According to KHA listing: <i>McCauleys #2</i>	Pastoralism

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>Alternative - (McCauleys Hut)</i> <i>Current site - Building ruin/site</i> <i>Description - Possible fireplace stones.</i>	
5082			647061	6046937	McCauleys Hut #3	According to KHA listing: <i>McCauleys #3</i> <i>Alternative - (McCauleys Hut)</i> <i>Current site - Building ruin/site</i> <i>Description - Site of single room stockmens hut ~5 x 3m, fireplace ~ 1 x 1m. Iron & timber remains on ground, beer bottles from 1962-68, wire made toasting fork.</i>	Pastoralism
5084			646992	6046858	Yards	According to KHA listing: <i>YARDS c1943-75</i> <i>Alternative - (McCauleys Hut) Port Phillip Break</i> <i>Current site -Yards ruin/ site</i> <i>Description - Site of post-war yards, possibly a small 'break' or common yard on Port Phillip Trail. Coords for SW corner. Old tins around wooden posts, wire, some netting.</i>	Pastoralism
4594	4862		645176	6048397	Port Phillip Break (KHA); Stock Reserve (OEH)	According to KHA listing: <i>Port Phillip Break c1950-70</i> <i>Alternative - PPB Stock Reserve</i> <i>Current site - Yards ruin/site</i> <i>Description - Site of post-war PPB yards; approximately 10-acre public stock reserve. Wooden posts and wire yards, remains of camp eg bottles, tins etc at southern end. One survey tree remains.</i>	Pastoralism
2563			644020	6048960	Ghost Gully Horse Camp	According to KHA listing: <i>Horse Camp (Ghost Gully)</i> <i>Current site - Horse yards (modern)</i> <i>Description - Roadside NPWS campground & horse yard.</i>	Recreation

Table 40 Port Phillip Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
PPSU2/H1 (Plate 26)	640247	6048285	Bridge over the Murrumbidgee River; two wooden spans with rock gabions, concrete blocks, steel plates and bolts; bridge dimensions 22 m L x 2.5 m W; gabion part c. 3 m L; Eastern wooden span 8 m; Western wooden span 10 m. Appears to have had a number of phases of construction/maintenance. The rock gabions appear to be a later addition.	Transport
PPSU3/H1 (Plate 27)	640263	6048204	SMHEA survey mark 16/92. The survey marker is set in a concrete bed located on the east side of the bridge on a rocky outcrop immediately adjacent to the road. The outcrop has been excavated for the road and the survey marker is on the edge of the cutting.	SMA
PPSU6/H1	644921	6048610	Tree with scar and axe marks. Very large old dead tree stump adjacent to road on southern side. Tree c. 4 m high x 2.5 m circumference taken at 1.5 m from ground level. Circular scar on south east side measuring 20 H x 17 W x 8 D (cm); 70 cm above ground level. Apparently random axe marking in scar. A similar scar located 50 cm above with no visible axe marks; tear drop shape. 27 H x 14 W x 3 D (cm).	Uncertain
PPSU7/H1	645165	6048368	Tree (Snow gum) with scar and metal axe marks located 6 m from existing road on southern side. Tree has a c. 4.7 m circumference as measured at 1.5 m from ground level. Scar measuring 60 H x 15 W x 30 D (cm); 93 cm above ground level. Axe marking on scar-face possibly the letters S and M. An old historic fence line c. 30 m WNW of scarred tree. Could be associated with the stock reserve and a survey tree as noted in KHA list.	Uncertain
PPSU7/H2	645130	6048379	Almost certainly the Port Phillip Break stock reserve fence. Fence running in a NW/SE alignment on the southern side of the road. Bored wooden posts 5 strand heavy gauge plain wire. Two standing posts. Corner strainer burnt and fallen to ground.	Pastoralism
PPSU7/H3	645176	6048397	Port Phillip Break c.1950-70. One standing wooden strainer post north of road adjacent to spear drain. Post covered in lichen with barb and plain wires attached.	Pastoralism
PPSU8/H1	646066	6048111	Bridle track c.1890-1920. No evidence observed.	Pastoralism

ID	Easting	Northing	Description	Theme
PPSU10/H1	647037	6046881	Remnants of old fencing; variety of different types of ringlock and wire extending c. 100 m south from the road. It appears as though there has been an old set of yards that have been reused casually as evidenced by more modern ringlock pieces. Possibly part of the yards c. 1943-75 complex as recorded by KHA. A 1964 beer bottle manufactured by The NSW Bottle Company (647037. 6046878). Rusted corrugated iron and tin cans over an area of c. 5 x 5 m (647010.6046825). A cluster of old rusty cans in a tree stump at 646990.6046848 and cluster of rusted tin cans at 646998. 6046844.	Pastoralism
PPSU10/H2	647030	6046968	McCauleys Hut complex on north side of road. Very little visual evidence of any features. A recent NPWS horse trap site extends through the centre of the complex. At 647074.6046941 a concentration of basalt cobbles and boulders c. 1.5 x 6 m in an E/W alignment; possibly structural and site of a hut. At 647058.6046949 a concentration of basalt cobbles and boulders in an area 3 x 3 m; possibly cultural. At 647030.6046981 a concentration of three corrugated iron sheets and potential stone hearth with incorporated tin can and wire, all in an area of c. 5 x 6 m. At c. 5 m to the north is a bottle dump consisting of late 1960s beer bottles screw top jars and ring pull cans etc. there is a very sparse scattering of wire and tin cans across the complex.	Pastoralism
PPSU13/H1	648844	6045464	Australian Estates cattle yard complex. Old track alignments parallel to the existing road on the east side. Area measuring c. 150 x 150 m. Plain wire and other scattered across the entire complex. At 648851.6045465 a shallow depression (? well) is located at interface of flat and slop; measures c. 5 x 5 m. At 648792.6045414 an old apple tree at site of cattle yards camp hut (no evidence of hut). No other features as per KHA list were observed.	Pastoralism
PPSU15/H1	649805	6045514	Remains of a fireplace of concrete construction with four independent iron bars (22 mm diameter) inset in base within fireplace (?SMA). The northern wall remains intact and standing measuring 55 cm x 85 cm x 15 cm. The remainder of the fireplace is highly degraded. The western back wall and the southern side wall have collapsed. A pebble aggregate mix has been used to construct the three walls with local cobbles set in base. Overall front opening is 90 cm wide and oriented to the east.	Uncertain

ID	Easting	Northing	Description	Theme
			The fireplace is located c. 11 m north of the main vehicle track, adjacent to a low dome shaped outcrop.	
PPSU19/L1	650066	6045507	Two levelled platform/bench features located off south side of Port Phillip Fire Trail, directly opposite Old Currango walking track trail head. Platform 1 at 650006.6045507 is located at the base of a slope and is a pushed gravel feature level area, measuring c. 50 m x 30 m (possibly modern). Modern carpark on previously levelled area (?). Platform 2 at 650162.6045478 (located c. 50 m south of Platform 1); older levelled area c. 100 m x 20 m (NNW/SSE alignment). Pushed out and levelled mechanically. SMA (?) vehicle/equipment/camp (?). Subsurface material is assessed as low.	Uncertain



Plate 26 Port Phillip Road: PPSU2/H1 wooden bridge; looking 230°.



Plate 27 Port Phillip Road: PPSU3/H1 SMA survey mark.

7.2.17 Tantangara North

The field survey at Tantangara Dam North was conducted in December 2017. The survey area has been subject to a reasonably comprehensive field survey. This survey extends from the junction with Port Phillip Trail, south to the north west side of Tantangara Dam.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland.

The historic items previously recorded in the Tantangara Dam North area are listed in Table 41. These are two hut sites (likely to be the same) listed by the Kosciusko Huts Association and OEH. The exact theme represented by the hut sites is uncertain and may be related to the theme of SMA or pastoralism. There are no sites of State or local significance present in the survey area. The potential historic items recorded during the field surveys are listed in Table 42.

The Tantangara Dam North survey area is now outside the development footprint. While the Tantangara Dam North historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 41 Tantangara Dam North: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
351			648641	6043671	Dam Track Hut #2	According to KHA listing: <i>Dam Track Hut #2 c1960-70</i> <i>Alternative - Site 6</i> <i>Current site - Building ruin/site</i> <i>Description - Site of SMA transportable or stockmens hut shown on SMA maps 1962 & 67. Possible site is next to a gully where there is some iron, rocks and rubbish including rusted 44-gallon drum.</i> See below TNSU3/H4	Uncertain
	5452		648713	6043684	Unnamed Hut Ruin	OEH recording of hut ruin; possibly same hut as above with differing grid reference points.	Uncertain

Table 42 Tantangara Dam North: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
TNSU3/H1	648730	6043125	Midden of glass fragments, bottles (including a complete gin/whiskey bottle and rusty cans in an area 4 x 4 m. The materials are not recent camping debris and may have a certain age.	Uncertain
TNSU3/H2 (Plate 28)	648798	6042954	SMHEA survey mark. Survey mark #2/16/4. Bronze marker cemented into a natural rock outcrop.	SMA
TNSU3/H3	648431	6042752	<i>In situ</i> concrete fireplace with a bottle midden; likely to be a SMA survey camp site. Rusty cans are imbedded in the concrete fireplace as a decoration. The bottle midden is 10 m upslope from the fireplace in an area 10 x 5 m. site contains ceramic old beer bottles beer punch top cans. The bottle fragments date from 1959 to 1960. The area to the north appears to be benched and maybe an encampment associated with the fireplace. There is no known reference to this survey camp.	SMA
TNSU3/H4 (Plate 29)	648604	6043703	Possibly Dam Track hut #2 (KHA list). Fireplace on an old cut and benched track (KHA historic routes: bridle track c.1880-1940). Remains of a concrete based	Uncertain

ID	Easting	Northing	Description	Theme
			fireplace; c. 1.5 x 1 m; cans in concrete (similar to TNSU3/H3). Cobbles in the fireplace rubble could have been part of the fabric; the extant concrete fabric includes rusty cans. A scatter of sardine cans and broken beer bottle and old green glass fragments. Fireplace is located 10 m to the west of existing Dam Trail.	
TNSU3/H5	648668	6043728	A copse of European deciduous trees (? variety of plum) in area 15 x 15 m surrounding a large <i>Eucalyptus stellata</i> . located immediately east of an old track and 15 m east of existing Dam Trail. Note. Unnamed hut ruin (OEH list) is located c. 50 m to the southeast. At the location of the unnamed hut ruin there is a slight excavated flat platform measuring 3 x 4 m; there are no artefacts or any other indications that this is a hut site.	Uncertain



Plate 28 Tantangara Dam North: TNSU3/H2 SMHEA survey mark.



Plate 29 Tantangara Dam North: TNSU3/H4, rubble of collapsed fireplace.

7.2.18 Bullocks Hill Fire Trail

The field survey at Bullocks Hill Fire Trail was conducted in November 2017 and January 2018. The Bullocks Hill Fire Trail survey area has been subject to a reasonably comprehensive field survey. This survey extends from the junction with the Snowy Mountains Highway, eastward along Bullocks Hill Fire Trail to the intersection with Hains Hut Fire Trail.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is a mix of open grassland and snow gum woodland. Ground exposures were generally negligible. The survey area was found to be disturbed adjacent to the track and relatively undisturbed elsewhere.

The historic items previously recorded in the Bullocks Hill Fire Trail area are listed in Table 43. These are listed by the Kosciusko Huts Association and are related to theme of recreation and transport. There are no sites of State or local significance in the survey area. The potential historic items recorded at during the field surveys are listed in Table 44.

The Bullocks Hill Fire Trail survey area is now outside the development footprint. While the recorded historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.



Plate 30 Bullocks Hill Fire Trail: BHSU2/L2 remains of timber bridge on Tantangara Creek; looking 270°.

Table 43 Bullocks Hill Fire Trail: Previously listed historic items.

KHA id.	OEI id.	s170	Easting	Northing	Name	Description	Theme
2568			637220	6039700	Bullocks Hill Horse Camp	According to KHA listing: <i>Horse camp (Bullocks Hill)</i> <i>Current site - Horse yards (modern)</i> <i>Description - Roadside NPWS campground & horse yard.</i>	Recreation
4922			641197	6042206	Timber bridge	According to KHA listing: <i>Timber bridge - c1950s-2007</i> <i>Alternative - (Tantangara Ck/Bullocks Hill)</i> <i>Current site - Structure ruin/site</i> <i>Description - Remains of wooden bridge; probably post WW2 origin. Concrete footing in creek, hewn round wooden bearers with sawn timber decking, now partly dismantled and burnt.</i>	Transport

Table 44 Bullocks Hill Fire Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
BHSU1/H1	639385	6041075	Costean; excavated hole adjacent and 10m north from the road. Function uncertain. The excavation measures c. 8 x 6 m with two mounds of mullock/spoil on the downhill side.	Mining
BHSU2/H1	641325	6042102	A tangle of old fence wire: plain, barbed and netting.	Pastoralism
BHSU2/L2	641197	6042206	Timber Bridge c. 1950 – 2007 (Plate 30)	Transport
BHSU3/H1	641789	6039392	A piece of cylindrical riveted sheet metal; rusty; c. 30 cm diameter; embedded in the head of a spring fed drainage line.	Uncertain

7.2.19 Bullocks Hill Fire Trail (Portal)

The field survey at Bullocks Hill Fire Trail Portal was conducted in October 2017. The Bullocks Hill Fire Trail Portal survey area has been subject to a reasonably comprehensive field survey. This survey extends north and west from Bullocks Hill Fire Trail.

In all Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often generally low. The area is open grassland.

There are no historic items previously recorded in the Bullocks Hill Fire Trail Portal area. The potential historic items recorded during the field survey are listed in Table 45.

The Bullocks Hill Fire Trail Portal survey area is now outside the development footprint. While the historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 45 Bullocks Hill Portal: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
BHPSU3/H1 (Plate 31)	639990	6042388	Artificial rocky cairn (loose pile) on a natural rocky outcrop. Measures c. 1.1 m long x 0.9 m wide x 0.5 m high. Old purple glass shard found within cairn. May be associated with BHPSU3/H2, see below.	Mining
BHPSU3/H2 (Plate 32)	639864	6042367	Old gold mine diggings. Concise diggings on west side of creek, on a basal slope/creek bank interface. Elongated excavation/workings c. 20 m long x 10 m wide in SW/NE alignment. Depth c. 40 - 80 cm. Consists of excavated workings.	Mining



Plate 31 BHPSU3/H1 stone cairn; looking west.



Plate 32 BHPSU3/H2 Mine site in gully (mid area of photo) taken from BHPSU3/H1 stone cairn; looking 240°.

7.2.20 Hains Hut Fire Trail

The field survey at Hains Hut Trail was conducted in January 2018. The Hains Hut Trail survey area has been subject to a reasonably comprehensive field survey. This survey extends east to the Murrumbidgee River from Bullocks Hill Fire Trail.

In all Hains Hut Trail Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is open grassland.

The historic items previously recorded in the Hains Hut Trail area are listed in Table 46. These are listed by the Kosciusko Huts Association and OEH (s170) and comprise Hains Hut and Hains paddock. There are no sites of State significance present in the survey area. No additional historic sites were recorded during the field survey.

The Hains Hut Trail survey area is now outside the development footprint. While the Hains Hut Trail historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.



Plate 33 Hains Hut; Looking east.

Table 46 Hains Hut Trail: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
123		4942	643883	6040413	Hains Hut (Plate 33)	According to KHA listing: <i>Hains Hut 1947</i> <i>Current Site - Building(s)</i> <i>Description - Corrugated iron trappers hut. Single room plus partly enclosed verandah. Fireplace, unlined. Built by Herbert Hain as a base for rabbit trapping; later used for fishing.</i>	Pastoralism
	4943		643913	6040384	Hains Paddocks		Pastoralism

7.2.21 Tantangara Dam

The field survey at Tantangara Dam was conducted in November 2017 and October 2018. The Tantangara Dam survey area has been subject to a reasonably comprehensive field survey. This survey extends along the west side of the southern extent of Tantangara Dam.

In all Tantangara Dam Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is comprised of a north/south trending ridge on the west side of the dam, from which spur crests descend towards the dam.

The historic items previously recorded in the Tantangara Dam area are listed in Table 47. These are listed by the Kosciusko Huts Association and are primarily related to construction of Tantangara Dam (SMA). There are no sites of State or local significance present in the survey area.

Within the broader area, items relating to pastoralism and some mining features are present. The potential historic items recorded at during the field surveys are listed in Table 48.

Table 47 Tantangara: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
4597			648590	6040650	Sheep Station (Tantangara Run 1885)	According to KHA listing: <i>Sheep Station (Tantangara Run 1885)</i> <i>Current site - Complex/ settlement ruin/site</i> <i>Description - Site of 1885 sheep yards and possible hut(s). Not investigated or recorded.</i> No evidence of this site remains	Pastoralism
4527			648529	6040307	Sanko Smiths Hut	According to KHA listing: <i>Sanko Smiths Hut c1930-70</i> <i>Alternative - Harriss Homestead</i> <i>Current site - Building ruin/site</i> <i>Description - Collapsed ruin of stockmens hut built by JW Smith, reportedly with 'Cornish-style' stone work on chimney, corrugated iron roof.</i> See below: TSU14/H1.	Pastoralism
2620			649755	6037465	Tantangara Dam Airstrip	According to KHA listing: <i>Tantangara Dam Airstrip c1957-60</i> <i>Current site - Airfield site</i> <i>Description - Site of grass airstrip used by the SMA to fly in supplies and monitor progress of Tantangara Dam construction c1958-60.</i> Site under water.	SMA
4855			650080	6037700	Tantangara Dam Survey Camp (SMA)	According to KHA listing: <i>Tantangara Dam Survey Camp (SMA) c1952-55</i> <i>Current site - Camp site</i> <i>Description - SMA tent camp for survey work associated with the Tantangara project.</i> Site is now underwater.	SMA

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
2604			650160	6037405	Tantangara Intake structure	According to KHA listing: <i>Tantangara Intake structure</i> <i>Current site - Structure (modern)</i>	SMA
2603			650090	6037360	Tantangara Dam House	According to KHA listing: <i>Tantangara Dam House c1958-70</i> <i>Current site - Building ruin / site</i> <i>Description - Site of caretakers house constructed on completion of dam and removed c. 1970.</i>	SMA
1270			650280	6037455	Tantangara Dam	According to KHA listing: <i>Tantangara Dam 1960</i> <i>Current site - Dam and reservoir</i> <i>Description - Straight concrete gravity dam 216 m in length and 45 m high, constructed 1958-60 by Utah Australia and Brown and Root Sudamericana Ltd.</i>	SMA
2606			649190	6036435	Weather Station	According to KHA listing: <i>Weather station</i> <i>Alternative - (Tantangara)</i> <i>Current Site - Stream gauging or weather station.</i>	SMA
2607			649105	6036555	Quarry	According to KHA listing: <i>Quarry</i> <i>Alternative - (Tantangara)</i> <i>Current site - Quarry/gravel pit.</i> (Plate 35)	SMA

Table 48 Tantangara: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
E1	649194	6036301	A slight drainage line with a dugout pond and associated metal either side in a broad area measuring c. 75 m x 75 m (oriented N/S). It is in a general area of SMA activity during the dam construction but may be related to pastoralism or more recent camping. There is low potential for associated relics.	Uncertain
E2	649154	6036235	Old fence wire; heavy gauge; short length embedded in the ground. Site condition is poor. There is no potential for associated relics.	Pastoralism
E3	648996	6036261	Hardwood split post; drilled for 4 strands of wire; E-W alignment; has been burnt a long time ago; post measures 1.1 m high x 20 cm wide x 10 cm thick; another post with remnant 2 strands plain wire, one of barbed wire as a top wire and netting underneath; highly diagnostic; still has connections at 648971.6036271; a fallen post with barbed wire at 648956.6036223; standing post in creek with wire; strainer/corner post on west bank of creek where fence changes direction and becomes a N-S oriented.	Pastoralism
E4 (Plate 34)	649046 649014	6036314 6036339	European debris consisting of window glass, ceramic fragments and metal unearthed by rabbit diggings. Artefacts scattered over an area of c. 45 x 50 m; possible buried rubbish; the west edge built up with quarry material to create flat area of ground - ?construction/drill pad. The artefacts continue to the valley bottom with metal and a 44-gallon drum embedded in bank. The valley bottom is highly disturbed. This site may be an extension of E4. More metal fragments at 648993.6036162. The site is likely to have been a laydown area during the dam construction that has been mechanically modified to bury associated debris.	SMA
E5	649001	6035538	Buried machinery parts. Site is located in present day rehabilitation area in valley bottom adjacent to Quarry Road. The site is likely to have been a laydown area during the dam construction that has been mechanically modified to bury associated debris.	SMA
E6	648941	6036176	Remnant fence line aligned N-S with c. 3 m spacing; all posts are burnt and lying on the ground. Some remnant plain wire. Site condition is poor. There is no potential for associated relics.	Pastoralism
E7 (Plate 36)	648611	6036580	Mine shaft. Mine located at base of rocky outcrop on a spur crest; mine opening measures c. 3 m x 3 m and is greater than 20 m deep; mullock is on the east side and	Mining

ID	Easting	Northing	Description	Theme
			downslope. Very dangerous site; should not approach from the east side as the mullock is undercut at top.	
E8	648627	6036627	Costean; c. 4 m long x 2 m wide x 0.80 m deep; mullock on downhill slope.	Mining
E9	648928	6036747	Fence post; round; 5 drilled holes and chiselled/axed cut-out square section on same side as drilled holes; 3 m south of the post is an excavated depression c. 2 m diameter (function unknown).	Pastoralism
E10	648972	6036786	Costeans. Six excavated trenches or pits in a line; most likely costeans; 3 m x 3 m from top x c. 20-30 cm deep.	Mining
E11	648940	6036799	Wire rope in ?rock with vertical pipe 0.5 m away and 2 steel drums nearby; Shell emblem visible on top one of the steel drums; drums at 648957.6036813.	SMA
E12	648917	6036749	Costeans. Series of trenches, 9 to 10 pits with a deeper pit adjacent on northwest side on northwest side of vehicle track to top of knoll. Square pit 2m x 2m x 0.40m deep with some mounding on southwest side of pit.	Mining
E13 (Plate 36)	649171	6038124	Snowy Mountains Hydro Electric Authority Survey Marker 1003TS located c. 2.5 m off the vehicle track.	SMA
E14	648337	6037105	Rock stack; 2 small boulders placed atop a large underlying boulder; stack 1 m high in total; small boulders 40 cm high; cobbles wedged between small boulders for stability. Function unknown.	Uncertain
E15	648378	6037309	Costean; 3 m x 2 m x 1 m deep; mullock on eastern downhill side.	Mining
E16	648379	6037332	Costeans; series of pits over an area of c. 100 m x 100 m; extending north from E15; trench along break of slope measuring 20 m x 0.6 - 0.8 m deep; mullock along north side.	Mining
E17	648393	6037582	Costeans; over an area 50 x 50 m; pits measure c. 2 m x 0.8 m x 0.5 m; smaller pit located at 648387.6037610.	Mining
E18 (Plates 3 & 39)	648362	6037698	Snowy Mountains Hydro Electric Authority Trig station 1153 RL TS; located on a rocky prominence on a crest landform; trig 3.3 m high, constructed using milled timber 9.25 cm x 6.5 cm; bolted with galvanised bolts to secure; some nails; legs anchored with piles of cobbles and boulders; the top of trig is intact; box structure painted black and white; Mt Gudgenby visible from this point.	SMA

ID	Easting	Northing	Description	Theme
E19	648208	6038298	Old fence line with rocks piled along bottom of fence; posts on ground; oriented N-S; barbed wire scattered nearby; posts mostly gone; wire on ground extends in a N-S direction.	Pastoralism
			No recording	
E21	649221	6037344	Costean; excavated pit 15 m x 5 m x 1.3 m deep; mounded on downward side; square cut on eastern side of trench with right angled edge. Function unknown.	Mining
TSU14/H1 (Plate 40)	648658	6040498	Homestead ruin and fence line; located on broad near-level bench on broad ridge crest overlooking Murrumbidgee Valley [now Tantangara Dam] to east. Primary form of evidence is a collapsed chimney/hearth constructed from columnar slabs of ?dacite. Hearth is c. 2 m x 2 m stone and mortar. Primary form of material = 'columnar' blocks typically 60 - 100 cm long and rectangular/triangular in cross section [roughly 30 cm x 20 cm]. Height of hearth base = 90 cm [max.] Around 5 courses high. Stones embedded in deposit at base; indicated possibly more going on or perhaps rear of structure. Alignment of stones along edges of building/platform suggest NW/SE oriented building c. 6 m x 4 - 4.5 m. Earth platform and edges impacted by rabbit burrowing [excavated and mounded]. Bottles, glass, shoe leather, window glass, steel cans, steel sheet, wire, nails, old car tyre tread and staples eroding from deposit around base. Rough square pit c. 1.2 m x 1 m located c. 12 m from building platform - ?toilet pit. Loose plain wire scattered on level surface to south of building with some remnant hardwood posts. c. 10 m to the east of the building (a remnant fence line oriented 353°/173°). Posts/postholes at about 5 m spacing. Very few posts remaining – all fallen and fragmentary. Primarily all that remains are post holes and wire. Signs of sheep mesh within the vicinity. GPS of some post holes along the alignment: 648668.6040449; 648669.6040481; 648676.6040522; 648684.6040613. Condition of ruin site is good to fair. Rabbit diggings, but good potential for at least defining building layout. Moderate potential for relics.	Pastoralism
TSU14/H2	648716	6040656	Old vehicle track; three sections apparent along indicative alignment from 648614.6040599 and 648716.6040656. Dirt track c. 2 m wide with side cut up to 30 cm deep running upslope at 240°/60° orientation. Extends from downslope at 648716.6040656 to 648681.6040645 (c. 40 m). Now long-dead tree with trunk	Pastoralism

ID	Easting	Northing	Description	Theme
			diameter 20 cm growing in centre of alignment. Faint indication of upslope cut, break of slope at 648651.6040630, coincides with level bench area of c. 25 m x 12 m [orientation NW/SW]. Difficult to establish if bench is completely natural or culturally/artificially embellished; appears possibly cut on upslope side [c. 30 cm]; impression of downslope rounding exacerbated by heavy rabbit digging. Two fragments of barb and plain wire and piece of dacite from nearby homestead [SU14/H1] lying at southern end. Continuation of old track between 648626.6040611 and 648614.6040599.	
TSU14/H3	648537	6040562	Old wire. Accumulation of old fence wire – loose, no posts or holes. Several metres of old barb coiled/knotted around base of dead tree stump [no ready evidence of the tree being utilised as a post]. Some plain wire c.6m to the north. Small fragments of barb scattered across general area. One looped and tied length of plain wire protruding from ground @ 648546.6040557. Rusted and angled steel bar lying on ground here.	Pastoralism
TSU15/H1	648675	6039884	Hut. Hearth platform surface; stone hearth c. 1.4 m x 90 cm. country rock cobbles and small boulders, single course, rectangular form, associated mounded earth. On a level bench overlooking the Murrumbidgee River valley [easterly aspect]. A burnt stump [relic post] and corresponding post hole at rear of hut adjoining hearth provide additional indication of structure. The levelled surface [platform] may extend both north and south of hearth – difficult to ascertain precise boundaries but indication is of a N-S trending building roughly 3 m wide x 6 m long.	Pastoralism
TSU15/H2	648818	6040640	Old fence line evidences chiefly by postholes and fragmentary wire with c. 5 m post spacing. Rough E-W orientation. Hardwood [old] fence post at 648818.6040640, upright, loose in post hole; 1.2 m high x 15 cm x 15 cm. drilled for minimum 4 strands of wire. Single strand plain wire embedded downslope c. 2 m. Barb extruding at post hole at 648829.6040639; post hole downslope at 648836.6040640 [5 m spacing] and fragment of post; post hole with wire at 648848. 6040638. Fragments of loose plain wire and barb dispersed along rough E-W alignment between downslope 648983.6040651 and post hole at 648848.6040638. Upslope of standing post, holes continue at 5 m spacing to track at 648797.6040641 [straddle track]. Strainer post hole at 648780.6040644. Post holes continue at 5 metre spacing uphill, with loose wire	Pastoralism

ID	Easting	Northing	Description	Theme
			in vicinity. Square post hole at 648717.6040647 [30 cm x 30 cm]. Post holes and dispersed wire continue up slope to meet old track at 648689.6040647 [SU14/H2].	



Plate 34 Tantangara Dam – E4 looking 80°.



Plate 35 Tantangara Dam – SMA Quarry used during construction of the dam; looking 330°.



Plate 36 Tintangara Dam – E7 mine shaft and mullock; looking 300°.



Plate 37 Tintangara Dam – E13 SMA survey mark; looking 30°.



Plate 38 Tantangara Dam – E18 SMA trig; looking 340°.



Plate 39 Tantangara Dam – E18 survey mark.



Plate 40 Tantangara Dam: TSU14/H1 hut site; looking 195°.

7.2.22 Tantangara Road

The field survey at Tantangara Road was conducted over a four day period in October and December 2017. The Tantangara Road survey area has been subject to a comprehensive field survey. This area extends from the Snowy Mountains Highway, north to Tantangara Dam.

The area is comprised largely of forested gently to moderately undulating slopes. At Nungar Creek, the road crosses a wide, open and boggy plain.

In all Tantangara Road Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is open grassland. Ground exposures were generally negligible.

The historic items previously recorded in the Tantangara Road area are listed in Table 49. These are listed by the Kosciusko Huts Association and are primarily related to theme of transport or SMA. There are no sites of State or local significance present in the survey area.

Within the broader area, historic sawmills and some mining features are present. Numerous stone culverts are located along Tantangara Road, many of which are likely to have been built by the SMA. A sample of these have been recorded. The potential historic items recorded during the field surveys are listed in Table 50.

Table 49 Tantangara Road: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
2615			649080	6034360	Kellys Plain SGS & Weir	According to KHA listing: <i>Kelly Plain SGS and Weir c1960</i> <i>Current Site – Weir</i> This site is in the creek bed, east of the road.	SMA
275			647175	6029525	Tantangara Works Centre	According to KHA listing: <i>Tantangara Works Centre</i> <i>Alternative - Wares?</i> <i>Current site - Complex/settlement ruin/site</i> Features associated with the site complex are located adjacent to and on both sides Tantangara Road – see Table below.	SMA
4819			646504	6025222	Gang Gang Ck Camp (SMA) c 1952-55	According to KHA listing: <i>SMA camp of snow huts associated with road and powerline works for the Tantangara Dam project.</i> The site is located about 15 m west of existing road and outside the proposed footprint - See E56 in table below.	SMA
34			646457	6025129	Gang Gang Ck Camp #2/ Belchers Mill	According to KHA listing: <i>Site of SMA or sawmillers hut approx. 6 x 9 m some brick, clay pipes, window glass, pressed iron ceiling cover of hut, sawn timber and stone – water race for milling/mining.</i> This site could not be relocated.	SMA
4365			645995	6023735	Gang Gang Creek Diggings	According to KHA listing: <i>Gang Gang Creek Diggings c1890s</i> <i>Current site - Mine workings (abandoned)</i>	Mining

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>Description - Alluvial mine workings along creek from Graves to Broadheads/Belchers Mill. Race-lines and excavated ground.</i> The site is c. 35 m west and outside of proposed impact zone.	
331			645590	6022828	SMA Shed	According to KHA listing: <i>SMA shed c1955-65</i> <i>Alternative - (Tantangara Dam Turnoff) Site 40</i> <i>Current site - Building ruin/site</i> <i>Description - Site of shed, believed to be an SMA or DMR roadside shelter.</i> The site is at intersection of the Snowy Mountains Highway and Tantangara Road and there is no visual evidence of it or any indication of its location. The site is very wet and boggy and the area is highly disturbed. The site is not believed to be in the impact area (see map in KHA Huts List 1993)	SMA

Table 50 Tantangara Road: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
E22	649090	6034920	Rough stonework culverts on either side of Tantangara Road. 1.5 x c. 1 m high includes a c. 0.7 m diameter concrete drainage pipe. Could have been installed by SMA during road construction for access to Tantangara Dam site. No potential for associated relics.	Transport
E23	649031	6035025	Exit ramp made with quarried stone on southwest side of road. measures c. 12 m long. No potential for associated relics.	Transport
E24	649028	6035048	Stone culvert on southwest side of road. Dry stone random rubble stonework 1.3 m high x 2 m wide. Concrete drainpipe measuring 70 cm diameter; 2 inches thick.	Transport

ID	Easting	Northing	Description	Theme
			Stone culvert also on opposing side of road measuring 1.2 m wide x 80 cm high. Could have been installed by SMA during road construction for access to Tantangara Dam site. No potential for associated relics.	
E25	649067	6035213	Sone culvert on east side of road measuring 1.5 m high x 3 m wide: rough packed stone with very coarse mortar with concrete drainpipe 70 cm diameter. It extends to current road length. A comparable culvert on west side of road measuring 1.4 high x 2.5 wide with 80 cm of road base on top of it. No potential for associated relics.	Transport
E26	649085	6035277	Stone culvert on south west side of road. The concrete pipe is the same gauge ie 70 cm diameter but thinner (4 cm thick) suggesting a different source/age to those above. Pipe made with rough aggregate that is visible in the face. The culvert measures 90 cm high x 2 m wide. It is somewhat dressed stone on face and within construction. It does not conform to the current road width suggesting an earlier period of construction. A culvert on the north east side of road measures 105 m high x 2 m wide and is of similar construction to that opposite. No potential for associated relics.	Transport
E27	649116	6035487	Stone culvert. No potential for associated relics.	Transport
E28	649160	6036458	Old road alignment. No potential for associated relics.	Transport
E29	649560	6036458	Old fence line. Harwood billet cut posts. 5 strands of plain gauge wire. The top wire is through a drilled hole in the post. The bottom four wires are in notch and stapled. The fence appears to follow road alignment. Some posts are upright; others are burnt. The fence becomes truncated by road 40 m north of grid reference; the south end has not been determined. No potential for associated relics.	Pastoralism
E30	647409	6030045	Round strainer post. No potential for associated relics.	Pastoralism
E31	647475	6029779	Former SMA construction site: rehabilitated rock quarry on east side of road immediately north of Nungar Creek. No potential for associated relics.	SMA

ID	Easting	Northing	Description	Theme
E32	647390	6030381	Old road alignment; vestigial. Measures c. 3 m wide and is cut between 1 m and 1.8 m. The grid reference denotes where it intersects with Tantangara Road. Its alignment is 130/320°. No potential for associated relics.	Transport
E33	647589	6031725	Old road alignment; vestigial. It measures c. 3 m wide and is cut between 1.5 m on its east side. Grid reference denotes where it intersects with Tantangara Road. Its alignment is 30/210°. No potential for associated relics.	Transport
E34	647635	6031907	Old road; east side of existing road. It has been re-excavated to form a water diversion channel for existing road. On east side of old road an old steel cable is attached to trees or posts (function unknown). No potential for associated relics.	Transport
E35	647332	6032629	Old road; aligned 130°/290°. No potential for associated relics.	Transport
E36	648175	6033738	Remnant fence line on south east side of road. Old billet cut hardwood posts with three strands of heavy gauge plain wire. Aligned 230/50°. No potential for associated relics.	Pastoralism
E37 (Plate 41)	647314	6029671	Tantangara Works Centre SMA: A levelled area on northwest side of road; function uncertain but potential laydown area. Low potential for associated relics.	SMA
E38 (Plate 42)	647298	6029617	Tantangara Works Centre SMA: mechanically levelled area of ground. Low potential for associated relics.	SMA
E39	647249	6029607	Old fence line; one strainer post; aligned N/S then changes direction and doglegs to the south west. Poor condition. No potential for associated relics.	Pastoralism
E40 (Plate 43)	647208	6029565	Tantangara Works Centre SMA; excavated rectangular shaped pit; reinforced with wooden slabs of timber and corrugated iron sheeting; pit size c. 5 x 3 m; sparse scatter of metal nearby and mounds of rock. Some potential for associated relics.	SMA
E41	647140	6029440	Tantangara Works Centre SMA - Old section of road; cut and benched; and a mechanically levelled area directly adjacent and on east side of road. Some potential for associated relics.	SMA
E42	647120	6029422	Tantangara Works Centre SMA - Series of terraces/platforms visible along hill slope on east side of road. Some potential for associated relics.	SMA

ID	Easting	Northing	Description	Theme
E43	647102	6029419	Tantangara Works Centre SMA - Fragment of terracotta pipe in a fallen stump which is located on an excavated terraced area of ground on east side of ground.	SMA
E44	647037	6029374	Tantangara Works Centre SMA - Junction of old road with existing road; old road leads to SMA Men's camp area on south side of existing road. No potential for associated relics.	SMA
E45	646732	6029043	Rock quarry; directly adjacent to road; extends c. 200 m parallel to road; a metamorphic type rock; cut and benched; still in use. No potential for associated relics.	SMA/ NPWS
E46	646755	6028517	Old road alignment; c. 20 m east of existing road and running parallel; a steel cable is located further east of old road 30 – 40 m. No potential for associated relics.	SMA
E47	646761	6027798	Old fence line; plain wire with numerous burnt posts; N-S alignment; fence continues up slope. No potential for associated relics.	Pastoralism
E48	646665	6027481	Old fence post; 2 x strainer posts with two mortised holes cut in post – most likely for stay posts to be inserted; posts c. 4 m apart. No potential for associated relics.	Pastoralism
E49	646523	6026988	Section of old road; deeply cut and benched; located on east side of existing road. No potential for associated relics.	Transport
E50	646462	6026793	Excavated area west of road; 20 - 30 m long with cut and benching and possibly paddocking; channel at base of bench with some rusted steel cable and mounding. No potential for associated relics.	Mining
E51	646765	6026567	Mechanically scalped and pushed mounds of earth south of existing road; function unknown. On west side of road. No potential for associated relics.	Miscellaneous
E52	646688	6025862	Large excavated area c. 40 m west of road; in a drainage line; spoil adjacent; 6 m x 4 m x 1 m deep with spoil adjacent. No potential for associated relics.	Mining
E53 (Plate 44)	645546	6022802	Old fence line extends c. 100 m adjacent to the Snowy Mountains Highway at the Tantangara Road intersection. Hardwood spilt posts drilled for wire c. 5m apart. Wooden droppers drilled for wire; two between each post. Top wire is barbed with 5 heavy gauge plain wires. Alignment 40/220°. No potential for associated relics.	Pastoralism

ID	Easting	Northing	Description	Theme
E54	646164	6023875	Old track aligned 40/220° cut and benched into slope. From grid reference, it appears to be trenched and extends south west. It develops into a more defined trench with a mound of excavated material on west side for distance of c. 20 m towards creek. From grid ref. 646184.6023888 the trench forks into two trenches going uphill for c. 15 m, one extending 40° and the other 80°. The function of this item is uncertain. No potential for associated relics.	Transport
E55	646393	6025027	Old overgrown track. According to KHA, the track is an SMA track dating to the 1960's and can be seen on the 4 inch to the mile c. 1958 SMA map. No potential for associated relics.	SMA
E56	646483	6025210	Gang Gang Ck Camp (SMA) c 1952-55 Possible old SMA camp. Area c. 100 x 100 m. The site is in a large clearing on the west side of Tantangara Road immediately south of a minor drainage depression. Immediately to the south west of the drainage line is a cut and benched area measuring 25 m long x 6 m wide. There is ornate pressed tin rusty wall sheeting and ceramic sewer pipe shards dumped at the NW end of the benched area. The surface of the bench is uneven and disturbed by wombats. The hummocky mounds and depressions could be from plumbing drain into the drainage depression. A pit measuring 1 x 1.5 m x c. 0.5 m deep is SW of the bench and contains a rusty metal can. The site contains numerous subtle earthen features and a small amount of surface debris. High potential for associated relics.	SMA



Plate 41 Tantangara Road: E25 culvert on west side of road.



Plate 42 Tantangara Road: looking 210° along the SMA Tantangara Works Centre.



Plate 43 Tantangara Road: E40 in the SMA Tantangara Works Centre complex, an excavated and reinforced pit, looking 210°.



Plate 44 Tantangara Road: E53 Stock fence looking 240°.

7.2.23 Denison

The field survey at Denison was conducted in November 2018. The Denison survey area has been subject to a comprehensive field survey. This survey extends from the Alpine Creek Sawmill Site, eastward along the Snowy Mountains Highway, and hence to Providence Portal.

In all Denison Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the transmission line track exposures. The area is open grassland. Ground exposures were generally negligible.

The historic item previously recorded in the Denison area is listed in Table 51. This is a Kosciusko Huts Association listing and relates to the theme of sawmilling. There are no sites of State or local significance present in the survey area. The potential historic items recorded at during the field surveys are listed in Table 52.

The Denison survey area is now outside the development footprint except for a small area of Survey Unit 6 at the Tantangara Road intersection with the Snowy Mountains Highway. While the Denison historic sites are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 51 Denison: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
107			644670	6022330	Gang Gang Sawmill	According to KHA listing: <i>Sawmill/sawpit ruins/site.</i> It is noted that the grid reference has a margin of error of 250 m. The location of this site is uncertain however, there was no evidence of it in the survey area.	Sawmilling

Table 52 Denison: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
DSU5/H1	644079	6022111	Remnant fence line; wood posts; 4 plain wires and 1 barbed wire; aligned 70°/250°. Gate at 644309. 6022120. Some posts still upright along fence line. Fence continues toward Gang Gang Creek, c. 20 m from road. The site condition is poor. There is no potential for associated relics.	Pastoralism
DSU6/H1	645563	6022733	Remnant fence line; opposite Tantangara Dam Road turnoff. Three visible posts; 5 x plain wire and 1 x barbed top wire; aligned 210°/30°; located c. 20 m from road; fence line continues west and parallel to road. The site condition is poor. There is no potential for associated relics.	Pastoralism

7.2.24 Rocky Plains Transmission Line

The field survey at Rocky Plains Transmission Line was conducted in November 2018 and has been subject to a reasonably comprehensive field survey. This survey area extends from the Alpine Creek Sawmill site, north west along the transmission line to its intersection with the Snowy Mountains Highway west of the Rocky Plains Horse Camp.

In all Rocky Plains Transmission Line Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is comprised of forested hilly country and open grassland on frost hollow drainage lines. Ground exposures were generally negligible. Certain areas were found to be relatively undisturbed.

The historic items previously recorded in the Rocky Plains Transmission Line area are listed in Table 53. These are Kosciusko Huts Association and OEH listings. There are no sites of State significance in the survey area. Two sites are of local significance (s170): Alpine Sawmill and Alpine Sawmill Water Race.

At Alpine Creek, a large number of individual heritage items associated with Kelly's Providence Sawmill are on the Kosciusko Huts Association list. The potential historic items recorded at during the field surveys are listed in Table 54. The Kelly's Providence Sawmill items have been grouped as a complex. The majority of other items recorded are related to pastoralism, including Harold Lockyer's 1940s stock yards (KHA). The numerous fences in the survey area are likely to have been associated with Lockyer.

The Rocky Plains Transmission Line survey area is now outside the development footprint. While the heritage items in this area are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 53 Rocky Plains Transmission Line: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
5056			643224	6022013	Mill Hut #1	According to KHA listing: <i>Mill Hut #1 c1878-1950</i> <i>Alternative - (Alpine Sawmill / Kellys Providence Mill, Woodcrofts Alpine Ck Mill)</i> <i>Current site - Building ruin/site</i> <i>Description - Site of sawmill building/staff hut, ~12 x 6m; chimney at north and 3 x 3m outbuilding adjacent south end. Shown on 1944 airphoto; possibly hut built by Joseph Woodcroft shown on 1879 survey. A part of the complex RPtxSU1/2; see below.</i>	Sawmilling
5057			643241	6022059	Mill Stable and Yards	According to KHA listing: <i>Mill stable and yards 1936-50</i> <i>Alternative - (Alpine Sawmill / Kellys Providence Mill)</i> <i>Current site - Building ruin/site</i> <i>Description - Site of sawmill building, ~7.2 x 6 m having gable roof with skillion along east side, set amidst timber rail yards ~12 x 8 m. Shown on 1944 air photo. A part of the complex RPtxSU1/2; see below.</i>	Sawmilling
5058			643296	6022069	Mill Hut #2	According to KHA listing: <i>Mill Hut #2 1936-1982</i> <i>Alternative - (Alpine Sawmill / Kellys Providence Mill)</i> <i>Current Site - Building ruin/site</i> <i>Description - Site of 1-room weatherboard hut; bricks, stone chimney, wild fruit trees remain. Possibly dating back to Woodcrofts Mill of 1878. Alternative coordinates 643286 6022093 SG. A part of the complex RPtxSU1/2; see below.</i>	Sawmilling

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
6	1958	5408	643284	6022006	Alpine Sawmill (KHA); Stan Kellys Providence Mill Alpine Sawmill (OEH)	According to KHA listing: <i>Alpine Sawmill/Kellys Providence Mill 1878-1982</i> <i>Alternative - Kellys #3 Sawmill</i> <i>Current site - Sawmill/sawpit ruin/site</i> <i>Description - Site of sawmill operated by the Kellys 1936-46; possibly situated on site of 1870s mill operated by Woodcroft. Kellys main sawmill buildings include one ~12 x 7m and one adjoining ~18 x 7 m. A part of the complex RPtXSU1/2; see below.</i>	Sawmilling
		5409	643313	6021884	Alpine Sawmill Water Race	Alpine Sawmill Water Race	Sawmilling
5062			643284	6022037	Woodcrofts Hut	According to KHA listing: <i>Woodcrofts Hut 1878-1900s</i> <i>Alternative - (Alpine Sawmill / Kellys Providence Mill, Woodcrofts Alpine Ck Mill)</i> <i>Current site - Building ruin/site</i> <i>Description - Possible site of hut built by Joseph Woodcroft and shown on 1879 survey; 1944 air photo shows faint rectangular disturbance. Alternatively, Stan Kellys Hut may have been the original Woodcrofts Hut. A part of the complex RPtXSU1/2; see below.</i>	Sawmilling
5060			643330	6022009	Woodcrofts Alpine Sawmill	According to KHA listing: <i>Woodcrofts Alpine Sawmill c1878-85</i> <i>Alternative (Alpine Sawmill / Kellys Providence Mill)</i> <i>Current Site Sawmill/sawpit ruin/site</i> <i>Description Possible site of water-driven sawmill built by Joseph Woodcroft and shown on 1879 survey. 1944 air photo shows ~15 x 6m structure/disturbance. Alternatively, to</i>	Sawmilling

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>south at 643303E 6021847N. A part of the complex RPtxSU1/2; see below.</i>	
5061			643274	6021964	Mill Hut #3	According to KHA listing: <i>Mill Hut #3 1936-46</i> <i>Alternative - (Alpine Sawmill / Kellys Providence Mill)</i> <i>Current site - Building ruin/site</i> <i>Description - Site of sawmill building/staff hut, possibly one structure ~6 x 4 m or two adjoining structures ~10 x 4 m shown on 1944 air photo. A part of the complex RPtxSU1/2; see below.</i>	Sawmilling
5063			643321	6021973	Alpine Creek Bridge	According to KHA listing: <i>Alpine Creek Bridge c1878</i> <i>Alternative - (Alpine Sawmill / Kellys Providence Mill, Woodcrofts Alpine Ck Mill)</i> <i>Current site - Structure</i> <i>Description - Timber bridge probably associated with early sawmilling; shown on 1879 survey plan of portion 12 and 1944 air photo. Replaced with a modern structure, date unknown. A part of the complex RPtxSU1/2; see below.</i>	Transport
5067			640825	6024550	Yards	According to KHA listing: <i>Yards c1930-69</i> <i>Alternative - (Harold Lockers Hut, Alpine #2)</i> <i>Current site - Yards ruin/site</i> <i>Description - Site of 1940s yards; timber post remnants. RPtxSU3/2; see below</i>	Pastoralism

Table 54 Rocky Plains Transmission Line: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
RPtxSU1/H1	643215	6022450	Old logging track off main track; c. 2.5 m wide; heads 330° up hill. The track is in moderate condition. There is no potential for associated relics.	Sawmilling
RPtxSU1/H2	643279	6022004	Remains of Kelly's Providence Sawmill and additional cultural features in the adjacent and surrounding landscape, on level to near level terrain on the west side of Alpine Creek. The Providence Mill site comprises at 643279. 6022004 an intact steam engine parked in N-S alignment. The engine is 4.3 m long x 2.16 m high (stack extending an additional 56 cm) with four 1.18 m diameter spoked steel shod wheels bearing on the hub faces the only visible or remaining maker's mark on the engine ('Marshall Sons & Company Gainsborough'). According to Hueneker (2005: 336), the engine is in its original position (i.e. from field observation inside the mill building, not adjacent). The wheels have been secured with iron straps set in concrete footings. The engine stands atop an earth platform c. 18 m long x 7 m wide, oriented 0/180°; large postholes are apparent at the corners and at roughly 4 m spacing along the sides, with additional postholes both apparent and faintly indicated at internal points between the nose of the steam engine and the sawpit. An east-west oriented stone-lined sawpit c. 8 m x 2 m x 70 cm deep (now partially infilled) is located at the mill building's north end; some hardwood beam structure still remains inside the pit. Mature eucalyptus trees now grow directly around and within the building layout; at 643286. 6022010 a rectangular pit 1.5 m x 1 m x 20 cm deep to the south-east of the sawpit; at 643294. 6022001 (c. centre) directly to the east of the sawmill building and occupying the space between the mill and the creek is a levelled area c. 22 m x 18 m and enclosed by postholes with regular to semi-regular spacing of 4 to 7 m. A cut earth entrance ramp c. 14 m long x 4 m wide connects the area with the fire trail at the enclosure's south-east corner. Some earthworks (seemingly ditching for drainage) run along the southern margin of the level area. It is not apparent if this area is directly related to the sawmill (eg. as a log storage yard or vehicle compound) or postdates the complex (eg. as an old visitor carpark); at 643277. 6022022 directly to the north of the sawpit is a	Sawmilling

ID	Easting	Northing	Description	Theme
			<p>raised earth hut platform c. 5 m x 5 m; and at 643275. 6022020 a water race c. 80 m wide x 20 cm deep connects with the N-W corner of the sawpit and runs at 330/150°. Despite Hueneker's (2005: 336) description of the race connecting with the steam engine, the relationship between the race and the mill is not immediately clear on-site as a pumping point is not defined and the steam engine's current position is not over the race as stated in the account; and at 643264. 6022016 c. 15 m N-W of the steam engine/mill is a possible hearth remnant comprising a low earth and stone mound with rectangular form c. 2.5 m x 1.3 m. A mature eucalyptus tree is growing at one end in the stones. The Alpine Hill Fire Trail passes directly past the feature. Several additional historical cultural features occur in the vicinity of the sawmill, including at 643281. 6022032 directly north of the mill and hut platform occur two roughly E-W trending ditches and adjacent mounding, possibly the result of earlier shallow gold working. The ditches are fed from the race system utilised by the mill site – some modification of the race system is suggested to this end at 643269. 6022039 where the race network to the workings has been blocked by two boulders, effectively channelling flow to the mill. Adjacent hummocky ground occurs in a heavily overgrown area to the east of the hut platform and towards the creek roughly between GRs 643307. 6022013 and 643308. 6022033; at 643275. 6022020 the water race associated with the mill and gold workings runs at 330/150° for c. 26 m to a boggy zone at 643260. 6022044 from which a race runs at 643260. 6022050 oriented 0/180° for c. 10 m into heavily overgrown terrain. Above the boggy area another race passes at 643252. 6022055 running across slope at 15/195°; to the south it runs parallel to the western boundary of the sawmill area and further downstream, to the north it is well formed generally and runs through heavy vegetation contouring above Alpine Creek; at 643237. 6022064 75 m north-west of the mill a stone structure suggestive of a hearth/chimney base is evident. It is formed from boulders and cobbles in an 'L' shape 2.9 m x 1.5 m and c. 1 m thick; an old steel can lies at the corner point within the composite stones. A possible building platform of earth and stone sits adjacent to the north-west, c. 4 - 5 m long x 3 m wide. Artefacts occur in close</p>	

ID	Easting	Northing	Description	Theme
			<p>proximity to the hearth including embedded iron sheeting 3 m to the east, a cast iron bed leg and a flattened roll of 'chicken wire' mesh 4 m to the east north-east; at 643226. 6022071 c. 14 m north-west of the hearth and beneath some mature eucalyptus trees is an accumulation or dump of old beer bottles (one dated to 1948) seemingly associated with a concentration of stones; at 643199. 6022021 is a length (c. 7 - 10 m long) of semi-coiled 30 mm gauge braided steel cable semi-embedded in the ground, 12 m to the north at 643196. 6022033 is a 1 m x 90 cm rectangular pit c. 45 cm deep with what appears to be the same cable protruding; at 643279. 6022041 c. 35 m north of the mill is a 4 m long alignment of four small boulders oriented 310/130°, possibly associated with the adjacent mining activity; at 643223. 6022029 on an elevated flat c. 66 m west of the steam engine is a stone structure, possibly a hearth composed of split boulders and river cobbles c. 2 m x 2 m x 40 cm high square mound form. Some timber is possibly incorporated into the feature. A mature eucalyptus tree is growing in the mound centre; at 643269. 6021986 4 m to the south of the fire trail that crosses Alpine Creek and directly opposite (20 m south south-west of) the steam engine is a piece of structural iron partially embedded in a eucalyptus tree. The artefact is a solid angled section set in a base plate 40 cm long x 19 cm wide and appears to be of 'mechanical' origin (part of the steam engine?). A length of 30 mm braided steel cable protrudes from the earth surface 2 m to the west; and to the south of the mill site on the opposite (i.e. south) side of the fire trail the landscape has been heavily modified (ditched and mounded) ostensibly for gold working. The workings connect with Alpine Creek at 643285. 6021945 and extend at an angle back to the fire trail at 643267. 6021982. A bottle dump disturbed by animal burrowing and/or fossicking occurs at the edge of the adjacent flat at 643285. 6021961. c. 7 bottles and broken pieces of brown, clear and green glass (majority NSW Bottle Co.) lie on the surface (Plate 45).</p>	
RPtxSU1/H3	643215	6022450	Old logging track off main track; c. 2.5 m wide; heads 330° up hill. The track is in moderate condition. There is no potential for associated relics.	Sawmilling

ID	Easting	Northing	Description	Theme
RPtxSU2/H1	642717	6023990	Very heavy gauge plain wire [5 mm thick] c. 12 m long; tied 5 times around a fallen burnt log [c. 6 m long] with a fork; tied off twice around at opposite end to a 70 cm long piece of wood. 2 rusty 20-gallon drums c.10 m upslope of wire; possibly oil drums. The site condition is poor. There is no potential for associated relics.	Miscellaneous
RPtxSU3/H1	640921	6024580	Old remnant fence line; two posts; N-S orientation; some barbed and plain wires and mesh. Posts are fire damaged. The site is in poor condition. There is no potential for associated relics.	Pastoralism
RPtxSU3/H2 (Plate 46)	640820	6024551	Old remnant fence line; located 25 m south of road. Two posts; E-W orientation. Joins what appears to be old stock yards [an area c. 10 m x 10 m]. The site is in poor condition. There is little potential for associated relics. Harold Lockyer's 1940s stock yards (KHA; see above)	Pastoralism
RPtxSU7/H1	639106	6025835	Old remnant fence line; located under transmission line on a west facing slope. N-S aligned fence. Gate posts with reinforced posts; 6 strands of heavy gauge plain wire. The site is in poor condition. There is no potential for associated relics.	Pastoralism
RPtxSU8/H1	639455	6026400	Isolated old fence post; round post with plain wire; fire damaged; lying on ground; 70 cm long x 20 cm diameter; located 7 m south of Snowy Mountains Highway; site condition is very poor. Rusted thick twisted steel cable c. 12 cm diameter embedded in ground nearby at 639621.6026151.	Pastoralism
RPtxSU8/H2	639596	6026195	Old fence line; traverses Rocky Plain; Remnant fire damaged fence line; this site most likely associated with RPSU7/H1; 6 plain wire threaded through drilled small split round posts; standing but fire damaged; 90 cm high x 20 cm x 11 cm; using wire as guide, alignment roughly trends 150/330°; Evidence of timber droppers used as rectangular loops tied along plain wires at intervals; post at 639601. 6026184; poor condition; 6 plain wires. Post at 639622.6026137; snapped burnt stump remaining in ground with 6 light gauge plain wires located adjacent. Post on ground at 639632. 6026109; poor condition. Post on ground at 639641. 6026090; very poor condition. Post standing at 639661.6026040; good condition; located on cutting above Highway with wires threaded through drilled post; some fire damage; fence still travelling along 150/330° alignment. Post at 639673. 6025995; on ground. Post at 639677.6025986 standing with 7 wires and 6 drilled holes and	Pastoralism

ID	Easting	Northing	Description	Theme
			one wire located in top notch in post. Post at 639696.6025906 lying down; 7 wires. Post at 639709.6025855; standing; 7 drilled holes. Following three posts all lying down and in very poor condition; post at 639720.6025824; post at 639722.6025816; post at 639738.6025792. Following four posts are standing and run parallel to Highway with 7 wires either attached or nearby; Post at 639784.6025733; post at 639798.6025716; post at 639822.6025690; post at 639828.6025681. Site condition is variable however provides evidence of fencing materials used and still indicative of alignment/boundary.	
RPtxSU8/H3	639715	6025976	Remnant old fence line; traverses Rocky Plain c. 20 m north of highway; aligned 140/320°; Round post at 639715.6025976; standing; fire damaged; 88 cm high x 20 cm diameter; two top bars two heavy gauge plain wire and mesh [giant chicken wire like] attached to second plain wire. Embedded wires at 639724.6025955. Post at 639691.6026047 very poor condition; same wire configuration as above.	Pastoralism
RPtxSU8/H4	639697	6026033	Old road alignment; GR end point of visible road; road on low rise in Rocky Plain; c.40 m NNE of Highway. Visible evidence of road peters out at 639697.6026033 and 639716.6025985. Road curves and cut with spoil banked along north east margin. Points along road: 639710.6026015; 639715.6026007; curve in road at 639724.6025990; cut/spoil edge c. 50 cm high [max.]; road width c. 2 m; curve ends on crest near granite tor outcropping and fence line [RPtxSU8/H3]. Section of fence line [RPtxSU8/H3] appears to run parallel to old road on SW edge.	Pastoralism
RPtxSU8/H5	639775	6025796	Old fence line; traverses valley bottom in plain proper. Line of standing posts oriented 170/350°; continues across plain in a NNW direction; Post lying at 639776.6025826. Post standing at 639778.6025834; split round 126 cm high x 18 cm x 11 cm, 6 drill holes; 2 x heavy gauge wire. Post at 639775.6025810 laying down and poor condition. Post hole at 639775.6025796 remnant post nearby. Scattered pieces of wire; and large chicken wire-like mesh. Fence doglegs [no evidence remains at turn point] then follows highway aligned 125/305° and posts continue. Following four posts lying down and fire damaged. Post at 639791.6025763; post at 639793.6025762; post at 639799.6025755; post at 625805.6039748. Post at 639819.6025729. Standing post at 639830.6025715; split; fire	Pastoralism

ID	Easting	Northing	Description	Theme
			damaged; drilled 2 holes; post as above at 639840.6025707 with 2 heavy gauge plain wire threaded and large chicken wire-like mesh. Post at 639854.6025693 lying on ground with remnants of mesh; post at 639866.6025674 and at this point fence crosses Rocky Plain Creek and continues adjacent to Highway oriented 100/280°. Posts east of Rocky Plain Creek: Post at 639910.6025660; standing; partially burnt; no drill holes; 108 cm high x 15 cm x 15 cm. Post at 639953.6025636 standing; fire damaged; 2 x drill holes; 2 heavy gauge plain wires and large chicken wire-like mesh tied to bottom plain wire. Post at 639991.6025621; lying down; poor condition; pieces of embedded plain wire located nearby.	



Plate 45 RPtXSU1/H2 Kelly's Providence Mill complex: dump of old beer bottles (one dated to 1948).



Plate 46 RPtXSU3/H2 stock yards looking 185°.

7.2.25 Rocky Plains

The field survey at Rocky Plains survey area has been subject to a reasonably comprehensive field survey. This survey extends from the Snowy Mountains Highway, north to the south-east end of Kiandra via the Rocky Plains Horse Camp.

In all Rocky Plains Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. The area is open grassland. Ground exposures were generally negligible.

The historic items previously recorded in the Rocky Plains area are listed in Table 55. These are Kosciusko Huts Association listings and relate to the theme of pastoralism. There are no sites of State or local significance present in the survey area. The potential historic items recorded at during the field surveys are listed in Table 56. The Rocky Plains historic items are either old road alignments or old stock fences.

The Rocky Plains survey area is now outside the development footprint. While the Rocky Plains heritage items are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.



Plate 47 Rocky Plains: RPSU3/H1 cut and benched old road alignment.

Table 55 Rocky Plains: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
298			639356	6027020	Rocky Plain Hut	According to KHA listing: <i>Rocky Plain Hut c1943-70</i> <i>Alternative - Site 10, Shanleys Hut</i> <i>Current site - Building ruin/site</i> <i>Description - Ruin of stockmens hut believed to be built by Shanleys; iron chimney on timber frame and hearth stones.</i>	Pastoralism
4997			639345	6026990	Holding Paddock	According to KHA listing: <i>Holding Paddock c1943-70</i> <i>Alternative - (Rocky Plain)</i> <i>Current site - Yards ruin/site</i> <i>Description - Site of holding paddock, probably built by Shanleys.</i>	Pastoralism

Table 56 Rocky Plains: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
RPSU1/H1	638026	6026927	Old road. Excavated bank oriented 330°/150°, c. 0.75 m high. Track appears to be wide and extends from horse camp. Very overgrown. Leaves alignment at GR and continues in a south westerly direction. The track is in moderate condition. There is no potential for associated relics.	Transport
RPSU1/H2	638517	6026756	Old road; oriented E-W; grassy clearing; road 5 - 6 m wide with a slight bank on the northern edge of track. The track is in moderate condition. There is no potential for associated relics.	Transport
RPSU3/H1 (Plates 47 & 48)	637819	6026912	Old track on crown road alignment; visible on aerial imagery; oriented 330°/150°; from transmission line; cut and benched c. 4 - 5 m wide; overgrown with shrubs; well-formed gutter on top side to the east; road becomes diffuse as it nears the valley bottom. An old fence line follows the track down to the valley bottom. Track continues to and intersects Snowy Mountains Highway. GR south end	Transport

ID	Easting	Northing	Description	Theme
RPSU3/H2 (Plate 49)	637995	6027810	Remnant old fence line; fence adjacent to old road [SU3/H1] on uphill side. Aligned N-S. posts c. 4.5 m apart. Two posts. One upright at 637995.6027810 and another post c.15 m north of above. Two barbed wires, two plain and mesh. This fence continues north, and an off-shoot fence follows downhill boundary of Crown Road all the way to Snowy Mountains Highway.	Pastoralism
RPSU5/H1	639373	6026693	Old fence line. Located on very gentle simple slope running on both sides of Rocky Plain Horse Camp access track. Aligned 50/230°; NE of road 2 x remnant posts on ground at 639373.6026694. Post at 639373.6026693 fragmented round post on ground c. 30 cm NE from vehicle track measuring 1,260 mm long x 250 mm diameter; barbed wire and heavy gauge plain wire tied to post with star picket. Directly beside above smaller round post with 3 drill holes – one threaded with doubled plain wire heavy gauge – 190 mm wide x 100 mm diam. x 970 mm long – fire damaged. SW of vehicle track split post sitting on ground with no other visible features at 639363.60266688; split post; measuring 1040 mm x 120 mm x 110 mm; standing at 639356.6026684; fire damaged with wires attached; one top wire sitting in a notch on top of post; 5 drilled holes with top two holes threaded with heavy gauge plain wire. Post at 639351.6026679. Post – timber dropper at 639352.6026681; fire damaged; 4 visible drill holes. Fence line vestigial, but still indicative of alignment/boundary.	Pastoralism
RPSU5/H2	639399	6026589	Excavated area; GR centre point; area c. 70 m long x 30 m wide; pushed up earth and excavated area c.15 m north east of vehicle access track; linear mounds of granitic gravels, pebbles and cobbles; one with juvenile Eucalypt gums on top; most likely mechanically excavated due to size of pits and mounds; mounds up to 1.5 m high; good quality quartz pebbled throughout; possibly related to highway construction however unsure of purpose or function.	Transport
RPSU5/H3	639384	6026534	Excavated pit. On lower slope above Rocky Plain. Rectangular shaped excavated depression located c. 5 m west of track; measuring c. 8 m x 4 m x 1.2 - 1.5 m deep; no visible spoil pile around margins nor nearby however ground visibility obscured by dense 1 - 2 m Hakea shrubs; length of pit runs parallel to track; dug in boggy	Miscellaneous

ID	Easting	Northing	Description	Theme
			side of track; possibly an augmented spring feature? although not sure of function or purpose.	



Plate 48 Rocky Plains Survey Unit 4 looking 170° along an old crown road alignment (continuation of RPSU3/H1).



Plate 49 Rocky Plains: RPSU3/H2 fence looking north.

7.2.26 Kiandra

The field survey at Kiandra survey area has been subject to a comprehensive field survey. This survey extends from Link Road and along the Snowy Mountains Highway to the north east end of Kiandra.

In all Kiandra Survey Units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent. The area is open grassland. Ground exposures were generally negligible.

The historic items previously recorded in or very near to the Kiandra survey area are listed in Table 57. The majority of the historic features at Kiandra relate to gold mining, however, some evidence of pastoral activities and transport also remain. Two heritage items of State significance are present: The Kiandra Courthouse (Plate 50) and Matthews Cottage (Plate 51). In addition, several OEH listings, some of which are of local significance (s170), and KHA listings occur. The potential historic items recorded at during the field surveys are listed in Table 58.

The Kiandra survey area is now outside the development footprint. While the Kiandra heritage items are described below and their location is shown on relevant maps, they are not subject to any further assessment in this report.

Table 57 Kiandra: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
5250			635140	6029285	Whipstick Dam	According to KHA listing: <i>Whipstick Dam c1890s</i> <i>Alternative - (Kiandra)</i> <i>Current site - Dam (small) or well</i> <i>Description - 'Dam' indicated on 1899 plan of GL54; ground disturbance within gully shown on 1944 air photo.</i>	Kiandra Gold Mining and Settlement
2616	5341 5331	SHR	634975	6029065	Courthouse 1890/Chalet 1943 (KHA); Kiandra Courthouse/Chalet Sheds (OEH 5341); Kiandra Court House/Chalet (OEH 5331)	According to KHA listing: <i>Courthouse 1890 / Chalet 1943</i> <i>Alternative - (Kiandra)</i> <i>Current site - Building complex</i> <i>Description - Bluestone courthouse designed by Colonial Architect James Barnett and built by Lansdowne Bros; adapted into chalet with major additions 1940s-60s; DMR depot 1974 - c2000. Being restored.</i> SHR listed	Kiandra Gold Mining and Settlement
		5343	634973	6029098	Kiandra Courthouse/Chalet Toilets	Kiandra Courthouse/Chalet Toilets	Kiandra Gold Mining and Settlement
		5336	634890	6028776	Infrastructure Sites		Kiandra Gold Mining and Settlement
4629			634985	6029045	SMA/DMR Snow Clearing Camp	According to KHA listing: <i>SMA/DMR snow clearing camp c1952-70</i> <i>Alternative - (Kiandra)</i> <i>Current site - Complex/settlement ruin/site</i>	SMA/DMR

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>Description - Barrack camp and equipment sheds for snow clearing. Sheds remain at rear of Courthouse/Chalet.</i>	
	5339		634913	6029034	Kiandra Township Sites	Kiandra Township Sites	Kiandra Gold Mining and Settlement
5276			634855	6029055	John Bourkes House	According to KHA listing: <i>John Bourkes House c1890s-60s</i> <i>Alternative - (Kiandra)</i> <i>Current site - Building ruin/site</i> <i>Description Site of large weatherboard house in 50 x 30m garden surrounded by exotic trees. Shown on 1899 & 1903 surveys and 1944 air photos.</i>	Kiandra Gold Mining and Settlement
5280			634958	6028925	Cosgroves Reef Mine	According to KHA listing: <i>Cosgroves Reef Mine c1907-10</i> <i>Alternative - (Kiandra)</i> <i>Current site - Mine workings (abandoned)</i> <i>Description - Site of shaft indicated on 1907 plan of GL101 Parish of Kiandra; ground formation/disturbance shown on 1944 air photo. Lease held by M Cosgrove; to William Bethune 1909.</i>	Kiandra Gold Mining and Settlement
4474			634842	6028850	Cologne Hutte	According to KHA listing: <i>Cologne Hutte</i> <i>Current site - Building ruin/site</i> <i>Description - 1960s private ski club lodge. Skillion roof, vertical timber boards, extensive windows.</i>	Kiandra Gold Mining and Settlement

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
4449			634938	6028791	Greg Days Snow Plough	According to KHA listing: <i>Greg Days snow plough</i> <i>Current site - Possible site.</i>	Kiandra Gold Mining and Settlement
172		5333	634895	6028789	Matthews Cottage (KHA); Matthews Cottage – Garden (OEH)	According to KHA listing: <i>Matthews Cottage c1900</i> <i>Alternative - Foleys</i> <i>Current site - Building(s)</i> <i>Description - Weatherboard miners cottage. 3 rooms, timber linings, stone fireplace. Built by John Foley sometime between 1900-06. Used by NPWS for exhibitions and interpretive displays.</i>	Kiandra Gold Mining and Settlement
	1921		634890	6028776	Kiandra Settlement and Precinct	Kiandra Settlement and Precinct	Kiandra Gold Mining and Settlement
4471			634907	6028723	Alpine Hotel	According to KHA listing: <i>Alpine Hotel</i> <i>Alternative - (Kiandra)</i> <i>Current site - Building ruin/site</i>	Kiandra Gold Mining and Settlement
4476			634913	6028686	School of Arts	According to KHA listing: <i>School of Arts</i> <i>Alternative - (Kiandra)</i> <i>Current site - Building ruin/site</i>	Kiandra Gold Mining and Settlement
4436			634841	6028729	Eastwood House	According to KHA listing: <i>Eastwood House</i> <i>Current site - Building ruin/site</i>	Kiandra Gold Mining and Settlement
4630			634869	6028661	Kiandra Hotel	According to KHA listing: <i>Kiandra Hotel</i> <i>Current site - Building ruin/site</i>	Kiandra Gold Mining and Settlement

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
4631			634827	6028673	Kiandra Snowshoe Club	According to KHA Listing: Kiandra Snowshoe Club Current site - Building ruin/site	Kiandra Gold Mining and Settlement
395	1817		634908	6028651	Yans Store	According to KHA listing: <i>Yans Store 1860-1981</i> <i>Alternative - Harris, Irwins</i> Current site - Building ruin/site Description - Site of an 11 roomed store building with verandah defined by two remaining chimneys. Built by Charles Cowper; operated by George Yan 1916-40s. Ruin by 1970s; demolished by NPWS 1981.	Kiandra Gold Mining and Settlement
472			634858	6028605	Dance Hall	According to KHA listing: <i>Dance Hall</i> <i>Alternative - (Kiandra)</i> Current site - Building ruin/site Description Site of Dance Hall, shown on RAAF air photo 1944.	Kiandra Gold Mining and Settlement
5265			634872	6028598	Sindels Store/ Goldstones store	According to KHA listing: <i>Sindels Store c1860/Goldstones Store c1880-1960</i> <i>Alternative - (Kiandra)</i> Current site - Building ruin/site Description - Site of timber shop building, shown on 1862 survey as Sindels Store & Bank of NSW, on 1883 plan of Lot 30 as Morrice Goldstones Store and on 1944 air photo.	Kiandra Gold Mining and Settlement
5266			634825	6028525	Short St Dam	According to KHA listing: <i>Short Street Dam c1880</i> <i>Alternative - (Kiandra)</i>	Kiandra Gold Mining and Settlement

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>Current Site - Dam (small) or well</i> <i>Description - 'Waterhole' indicated on 1883 plan of lot 30.</i>	
5262			635023	6028404	Jack Hawkins Hut	According to KHA listing: <i>Jack Hawkings Hut c1860-1900</i> <i>Alternative - (Kiandra)</i> <i>Current site - Building ruin/site</i> <i>Description - Site of hut shown on 1865 plan of Allot 4 Sect 1 of village. Large fenced garden at left. Transferred to John Thomas in 1868.</i>	Kiandra Gold Mining and Settlement
5263			635050	6028350	Gold Washing Reservoir	According to KHA listing: <i>Gold Washing Reservoir c1860</i> <i>Alternative - (Kiandra)</i> <i>Current site - Dam (small) or well</i> <i>Description - Earth walled dam used to store water for sluicing, shown on 1865 plan but probably from 1860 rush.</i>	Kiandra Gold Mining and Settlement
4442			636660	6027860	Eucumbene River SGS2	According to KHA listing: <i>Eucumbene River SGS2 c1950s</i> <i>Current site - Stream gauging/weather station ruin/site</i> <i>Description - Site of former SMA Stream Gauging Station. Shown on SMA 1960.</i>	SMA
2574		5338	635505	6027795	Kiandra Cemetery (KHA); Kiandra Pioneer Cemetery (OEH)	According to KHA listing: <i>Kiandra Cemetery 1860-1974</i> <i>Current site - Grave/cemetery</i> <i>Description - Cemetery site dating from c1860-1974. Approximately 12 headstones remain, although the</i>	Kiandra Gold Mining and Settlement

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
						<i>number of people interred is unknown. Short walking track with NPWS interpretive signage.</i>	

Table 58 Kiandra: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
NC25	634946	6029523	Old road. Section of unsurfaced vehicle track c. 5 m wide and 90 m long oriented 300/120 degrees truncated by the old Cooma-Tumut Road at its southern extent. The road exhibits a deep upslope cut c. 2 m deep with a culvert at the cut base. Extent is 634946. 6029523 to 634887. 6029591.	Transport
NC27	634876	6029549	Drain/culvert. A ditch drainage feature running straight downslope at orientation 145/325 degrees. Appears to be an artificially enhanced/created drainage line or channel c. 2 m wide x 50 cm deep and c. 50 m long. The ditch channels natural drainage from upslope at 634906. 6029526 and feeds water to workings at site NC24. Notable mounding of earth and boulders spans the drain at 634886. 6029526.	Kiandra Gold Mining and Settlement
NC28	634881	6029526	Water race. An indistinct ditch c. 1.5 m wide x 40 cm deep oriented 250/70 degrees along contour. Not clear if the race commences at channel feature NC27 or is cut by it. The race appears to have been cut by the old Cooma-Tumut Road and continues roughly east @634965. 6029535 oriented 70/250 °.	Kiandra Gold Mining and Settlement
NC29	634885	6029499	Water race. Largely indistinct and infilled ditch feature c. 1.5 m wide x 30 cm deep with orientation along contour roughly 240/60 degrees. Appears to have been cut by channel feature NC27. The race is cut by the old Cooma-Tumut Road and re-emerges to the east at 635001.6029512 orientation 70/250°.	Kiandra Gold Mining and Settlement
NC30	634901	6029483	Power/communications pole. Fallen hardwood post approx. 4.2 m long x diameter 20 cm at base. The post has been cut at ground level with remnant remaining embedded. Two coils of straight wire lie next to the post base.	Kiandra Gold Mining and Settlement
NC31	635105	6029447	Old road/track. Graded/cut dirt track c. 3 - 4 m wide running at orientation 10/190°. Becomes somewhat indistinct near intersection with the old Cooma-Tumut Road.	Transport

ID	Easting	Northing	Description	Theme
NC32	635050	6029398	Survey mark. An iron sump with hinged hatch and benchmark/datum inside. Number '1604' bolted inside hatch. The feature appears to still be in use and is marked by two yellow painted star posts.	Miscellaneous
NC33	635051	6029380	Road milestone. A milestone of tapering box form 1.26 m long x 31 cm diameter, square at base tapering to 23 cm at top. Consists of concrete with fine aggregate. Imprints 'T' over '58' and 'A' over '22' with faint remnant red paint are evident. The milestone is lying on its side c. 10 m to the NW of the old Cooma-Tumut Road. Marker indicates distance to Tumut (T) of 58 miles and Adaminaby (A) 22 miles.	Transport
NC34	634995	6029270	Benchmark peg. Hardwood post 7.2 cm x 9.2 cm x 39 cm tall inscribed with 'MR BM' on its eastern face. A roofing nail datum is set in the top centre of the peg. The peg has been driven into a level remnant surface c. 8 m to the east of the old Cooma-Tumut Road.	Transport
NC35	634957	6029267	Old road. Graded dirt track c. 4 m wide, orientation 310/130°.	Transport
NC36	634953	6029275	Old fence. A large posthole defining the corner post at the intersection of E-W and N-S fence lines occurs at the given GR. A second hole indicating the bearer pole for the corner post occurs immediately to the south west. Straight wire looped for the strainer lies adjacent to the holes. From this point, fragmentary straight and barbed wire paralleling a series of fallen hardwood posts and postholes with approximate spacing of 2 m defines the east-west fence line axis. The north-south fence line is indicated by fragmentary wire only and continues upslope to point 634938. 6029168.	Pastoralism
NC37	634944	6029214	Water race. A ditch c. 2 m wide x max 50 cm deep trending 260/80° and continuing westwards along the contour. A rock bar/wall constructed at 634941. 6029216 acts as a crossing point on a local drainage line.	Kiandra Gold Mining and Settlement
NC38	634945	6029191	Water race. A reasonably degraded ditch feature c. 1.5 m wide x 30 cm deep oriented 290/110° and continuing west along contour.	Kiandra Gold Mining and Settlement
NC39	634967	6029192	Old Cooma-Tumut Road. A former sealed dual lane (two way) main road c. 6 m wide. The section of road extends from 634967. 6029192 (just north of the Old Courthouse at Kiandra) to The Link Road at 634908. 6029639. Tarmac surfacing is apparent at the southern end of the road with the northern section ripped and	Transport

ID	Easting	Northing	Description	Theme
			dismantled. The road is fully formed (cut, banked, cambered and with drainage features).	
NC40	634940	6029179	Borrow pit. An earth/gravel quarry c. 36 m (E-W) x 14 m (N-S) x 1.5 m deep with an access/entrance point to the old Cooma-Tumut Road at 634946. 6029179. Possibly associated with the construction of the old highway crossing point over Whipstick Gully directly to the north.	Transport
NC41	634990	6029301	Mining landscape. Ground sluicing zone along the course of Whipstick Gully, evident in the gully landscape on both sides (east and west) of the Old Cooma-Tumut Road. Evidenced by boggy and widened drainage line c. 75 m wide and flanked by worked uneven soil edges upstream of the old road crossing point (west of points 634979. 6029284 and 635010. 6029320) and a series of eroded and remnant soil/drainage line surfaces downstream of the crossing (east of points 634979. 6029259 and 635031. 6029319).	Kiandra Gold Mining and Settlement
NC42	634091	6029443	Benchmark. Concrete benchmark/datum approximating with old fence line at site NC2. The marker comprises a concrete box form 16 cm square x 22 cm high. A roofing nail datum point is evident in the centre top of the marker.	Miscellaneous
NC43	634960	6029079	Old Kiandra Courthouse complex. Includes the original stone courthouse structure and later roadhouse highway frontage of c. 80 m (points 634937. 6029041 to 634963. 6029118). The complex includes the courthouse/roadhouse (with remnant pine tree), ski lodge/chalet and numerous other architectural features, remnants and deposits extending eastwards for a minimum of 120 m to the break of slope at 635047. 6029044. The stone courthouse building is located 17 m from the modern highway verge. Given GR marks central front point of complex.	Kiandra Gold Mining and Settlement
NC44	634976	6029146	Building remains. The basal remains of a building and alignment of trees in a disturbed area with highway frontage to the north of the Kiandra Courthouse complex. A large artificial earth mound is located to the immediate north and rear of the site. A cemented basalt cobble and brick hearth c. 1.6 m x 1.3 m x 20 cm remnant height, 60 cm thick at rear and 40 cm thick at sides. The fireplace opening faces east and onto a house/hut floor and outlay c. 10 m long x 4 m wide (E-W aligned) defined by wall bases of basalt cobbles and boulders. Hearth at 634978.	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
			6029143 with house centre at 634983. 6029144. An alignment of pine stumps indicates a prior row of mature trees extending northwards from the building for c. 23 m (GR 634989. 6029175 – 634981. 6029151). Some adjacent cobbles/boulders may be associated with the plantings and indicative of a border. At least five trees planted 1 m apart are apparent with a possible sixth as a loose stump evident 15 m to the north. A hearth is 8 m from modern road verge; the courthouse public toilet block is 40 m to the south east at 170 degrees. There is potential for additional architectural and artefactual material to occur in association with local deposits.	
NC45	634943	6029137	Kiandra township gold mining. Landscape modified by shallow gold working including sluicing along the western side of the highway. The area extends between the old Cooma-Tumut Road intersection in the north to Pollocks Creek in the south (GR 634943. 6029137 to 634869. 6028541). Features include cutting, banking, channelling, remnant worked landscape margins and eroded/scoured surface. Water management features adjacent and further upslope (races, ditches, dams) are connected with features falling within this linear corridor. Partial and heavy obscurement by vegetation and impacts from modern road construction are apparent. The mining landscape occurs in conjunction with and is overlain by contemporaneous and subsequent settlement in the township area.	Kiandra Gold Mining and Settlement
NC46	634883	6028789	Kiandra township gold mining. Landscape modified by shallow gold working including sluicing along the eastern side of the highway. Evidence of workings comprises a hummocky, washed landscape extending from Matthews Cottage in the south to the Courthouse complex in the north (GR 634883. 6028789 to 634916. 6028992). The workings manifest a natural downslope extension of the corresponding evidence occurring along the opposite (western) side of the highway; water management channelling extending between the two sides has been incorporated into a modern culvert setting beneath the road at 634931. 6028941.	Kiandra Gold Mining and Settlement
NC47	634912	6029135	Hut platform. A rectangular cut c. 5 - 6 m long (N-S) x 3 – 5 m wide in a mined area to the west of the modern highway c. 30 m from the highway verge. A possible stone lined hearth remnant occurs at the north end of the platform 1.4 m x 1 m.	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
NC48	634914	6029054	Old fence. An E-W trending vestigial fence line composed of burnt hardwood post fragments and occasionally outcropping straight and barbed wire. The eastern extent is evidenced by post and wire fragments at the edge of a bank c. 10 m west of the modern highway verge (appears to be a corner post associated with site NC49).	Pastoralism
NC49	634911	6029052	Tree alignment and fence. A remnant alignment of planted exotic trees, now felled, evidenced by a row of stumps paralleling the highway with the dead trunks dumped further upslope. The trees appear to have been large, mature specimens prior to their removal. Orientation is effectively N-S (185/5°) with a semi-regular spacing of c. 5 m. The alignment is c. 120 m long with a gap of 40 m at a drainage line (GR 634896. 6029004 to 634879. 6028958). Eight stumps occur between GRs 634911. 6028952 – 634896. 6029005 and four between GRs 634879. 6028958 – 634874. 6028939. Fragments of straight and chicken wire co-occur along the alignment both between and incorporated into the stumps, suggesting that the planting acted as part of a substantial local block boundary fronting the main road. The fence line continues to the south of the trees as a series of large postholes and some remnant outcropping wire. Ten postholes with an approximate spacing of 4 m are apparent for 40 - 50 m south of the trees between 634873. 6028928 – 634855. 6028877. Total marked boundary of c. 185 m extending along the western side of the highway southwards from the corner post at NC48.	Kiandra Gold Mining and Settlement
NC50	634856	6028867	Building remnants. Footings and infrastructure associated with a building/small building complex. Includes a concrete septic tank with breather vent/hatch and adjacent sewage pipeline (at 634855. 6028869), earth bench/platform with nails, wire, asbestos sheet fragments, glass (at 634853. 6028856), a concrete slab with mount bolts/studs (at 634854. 6028843). c. 14 m west or upslope from the modern highway verge. Could be a mid-late Twentieth Century structure.	Kiandra Gold Mining and Settlement
NC51	634867	6028780	Kiandra township streetscape. Remnant architectural landscape paralleling the upslope or western side of the modern highway approximately from opposite Matthews Cottage in the north to the edge of Pollock's Gully in the south (634867. 6028780 to 634873. 6028526). Evidence of multiple closely spaced buildings and associated infrastructure appearing as cuttings, earth platforms, mounds,	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
			depressions, channels etc. largely obscured by thick grassy cover. Occasional bare patches, erosion and animal burrowing have exposed artefacts and building materials. Partial truncation of some sites has occurred as a result of construction and alteration of the highway over time. Plentiful intact deposit and structure is still apparent. Multi-phase construction and some overlapping of locational use is evident; the remains of buildings appear to extend upslope to the west for c. 40 m. Fronts directly onto the current highway with intrusion into deposits and structure by existing road corridor apparent.	
NC52	634898	6028548	Kiandra township streetscape. Remnant architectural landscape paralleling the downslope or eastern side of the modern highway, c. from the old Courthouse complex in the north to the edge of Pollock's Gully in the south. Includes architectural remnants (earth building/hut platforms), some standing structure and archaeological deposit. Two general sections are apparent: a southern section between Pollock's Gully and Matthews Cottage (GRs 634898. 6028548 – 634885. 6028783) and a northern section between the gold workings north of Matthews Cottage and the old Courthouse complex (GRs 634901. 6028933 – 634923. 6028985). The southern section includes a concentration of hut sites (hummocky earth, platforms, structural stone, artefacts, fencing and pits) directly overlooking Pollock's Gully, Yan's Store (at 634908. 6028651), and a continuous sequence of earth building platforms with archaeological deposit and artefact exposures between Yan's Store and Matthews Cottage (i.e. the remains of the School Of Arts at 634916. 6028694, the Alpine Hotel at 634908. 6028720, a large stone walled platform at 634896. 6028744, and Matthews Cottage at 634891. 6028776). The northern section includes an archaeologically indeterminate zone of heavily grassed hummocky terrain with no readily apparent architecture or form apart from a single standing metal pipe/vent at 634928. 6028987, the site of the 1900 Post Office at 634932. 6029008, and the site of the Church of the Ascension at 634961. 6029039. Complex fronts current highway corridor.	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
NC53	634870	6028520	Pollocks Gully mining landscape. Evidence of multi-phase gold mining along and fringing Pollocks Creek, chiefly water management channelling and tailings mounds of basalt cobbles. The features occur on both sides of the highway and extend both up and downstream. Some mounds are substantial features tens of metres long, several metres wide and of greater than 1 m height. The majority of the features adjacent to the highway occur within 6 m of the road verge, however at some points mounds directly abuts the road bund (eg. at 634987. 6028426). Western side of the highway GRs 634870. 6028520 – 634988. 6028384; eastern side GRs 635073. 6028376 – 6034901. 6028533.	Kiandra Gold Mining and Settlement
NC54	634905	6028612	Old power/telecommunications line. A series of four standing hardwood poles with top cross arms and insulators set in an alignment that spans Pollocks Creek oriented 16/340° then 125/305°. Poles occur at 634905. 6028612, 634912. 6028563, 634917. 6028528, and 634949. 6028479 (stabilised with local stone mound at base and identified with stamped aluminium plug 'B 093W57 302'. Extension of powerline evident at NC60/61.	Miscellaneous
NC55	634986	6028392	Structural remains. Artefacts, fencing and basal building remnants. They include: a 18 m x 3 m concentration of artefacts (metal, cans/tins, ceramics, glass, utensils), ashy deposit and bone at the edge of a zone of tailings mounds at given GR. Beer bottles dated 1931 and 1949 are evident. A fence/ boundary /edge marked by a NE/SW trending length of chicken wire runs for 20 m through the site. Some window glass and loose asbestos sheet fragments occur at the periphery c. 5 m from current road verge; building/structure platforms and tabular basalt wall bases with introduced flowering bulbs at 635008. 6028387 – 635017. 6028380, c. 3 m from road verge; remains of a fence (chicken wire, straight wire, timber post and possibly incorporated stone) trending N-S from edge of road verge at GR 635036. 6028375. Continues upslope in vestigial form to at least 635003. 6028330; stone structure at 635004. 6028363 possibly a wall/hearth of basalt and brick c. 2 m x 1.5 m with a glass bottle and steel plate on adjacent surface. A possible earth platform to the north of the stone structure suggestive of a hut c. 5 m x 4 m; brick wire and metal sheet at 635012. 6028366; a fence post at 635059. 6028359 2 m from road verge	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
			(possibly fence marked on Gant Thompson's map as part of settlement complex). In vicinity of structural features '1014' and '1015' listed in Gant Thompson.	
NC56	635061	6028355	Possible mining landscape. Earthworks occurring along the south west side of the highway (GRs 635061. 6028355 – 635149. 6028276) and extending into adjacent terrain, including a series of straightened drainage lines/ditches, raised (tailings?) mounds, and broad shallow depressions possibly associated with water management and surface working. Features occur well within 10-15 m of the current highway corridor.	Kiandra Gold Mining and Settlement
NC57	635129	6028199	Mining and huts. A channelled/worked drainage line with adjacent artefacts and hut remains. The drainage line at 635145. 6028202 has been straightened and worked and the adjacent level terrain exhibits artefacts exposed by rabbit digging (glass beer and gin bottles, ceramics, metal sheet, metal strap, wire, nails and a belt buckle) at 635129. 6028199 (30 m from highway). Brown ware, nails and a button exposed at 635121. 6028214. Stone structures in area described by Gant Thompson as a Chinese occupation zone occur at 635088. 6028231 downslope from water races and an old road. Associated deposits occur within 30 m of the current highway corridor.	Kiandra Gold Mining and Settlement
NC58	635136	6028201	Survey peg. Old wooden peg 9 cm x 10 cm x 12 cm high in drainage line.	Miscellaneous
NC59	635119	6028305	Survey peg. Old wooden peg remains, 9 cm x 10 cm, burnt to ground level.	Miscellaneous
NC60	635158	6028312	Old road and power/telecommunications line. An eroded dirt road c. 4 m wide oriented 110/290°. Intersects modern highway at given GR and continues into adjacent area diverging from highway. An old power/telecommunications line (standing posts) parallels the road outside the survey area.	Transport
NC61	635199	6028306	Building/structure. A cut earth platform (possibly two) with exposed artefacts (old bottle glass and nails) and a square basalt stone-lined pit 1 m x 1 m at rear. The platform/s front onto the old road noted at NC60. An old fallen hardwood power/telecommunications pole lies adjacent at 635196. 6028298. 53 m from the current highway corridor	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
NC62	635265	6028118	Potential hearth. A stone and earth mound c. 2 m x 1.2 m in vicinity of structure '1046' noted in Gant Thompson. c. 10 m south of a water race in adjacent workings 30 m from highway	Kiandra Gold Mining and Settlement
NC63	635206	6028119	Water race. An earth ditch feature c. 2 m wide x 40 cm deep oriented 50/230°, intersects/is truncated by highway at given GR. The race continues on the opposite side of the highway at 635191. 6028105. Associated with sluicing workings nearby at 635214. 6028143. Potential worked surfaces also close to road (7 m from highway) at 635221. 6028114. Adjacent/nearby sluicing workings noted by Gant Thompson as 'common sluicing'.	Kiandra Gold Mining and Settlement
NC64	635198	6028145	Survey peg. Old wooden peg 9 cm x 9 cm x 9 cm high, burnt/fire damaged.	Miscellaneous
NC65	635203	6028079	Costeans. Identified by Gant Thompson as 'Drift/test shafts'. Three rectangular pits c. 12 m south of the modern highway. Dimensions are: 2.6 m x 3.3 m x 60 cm deep; 2.4 m x 4.3 m x 60 cm deep; and 2.5 m x 2.5 m x 30 cm deep.	Kiandra Gold Mining and Settlement
NC66	635196	6028103	Old road. Road/track intersects with modern highway at given GR. 4 m wide, shallow cut, oriented 210/30°. Previously identified by Gant Thompson	Transport
NC67	635204	6028090	Survey peg. Old wooden survey peg 10 cm x 10 cm x 6 cm high. Appears to have a datum nail hole in top centre.	Miscellaneous
NC68	635192	6028075	Water race. Earth ditch c. 2.5 m wide from downslope mound to cut x 30 cm deep. Contours at c. 150/330 degrees 25 m from current highway	Kiandra Gold Mining and Settlement
NC69	635030	6028414	Hut site. Possible hearth at location of 'Jack Hawkins' Hut'. Rectangular stone construct beneath grassy cover c. 2 m x 1.2 m. A section of steel rail or I-beam has been driven into the ground beneath a bush at 635025. 6028401. Approx. 12 m north of modern highway on level surface next to Pollocks Gully.	Kiandra Gold Mining and Settlement
NC70	635554	6027927	Earth cut. Rectangular basal slope cut 5 m x 4 x 1.6 m deep at rear, adjacent to the entrance to the old Kiandra Cemetery, 21 m from the modern highway. The cut resembles a building platform but no hearth is apparent and the soil is boggy, so possibly a small mine working associated with an upslope water race (at 635565. 6027905). Additional cuts/pits are apparent in the slope adjacent (at 635566.	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
			6027928) and directly upslope at 635575. 6027924, 635570. 6027919 and 635563. 6027911	
NC71	635601	6027898	Graves. A row of Chinese graves formerly identified by Lyndsay Smith. The graves occur outside the boundaries of the adjacent cemetery, 42 m upslope and to the south of the modern highway. A water race runs along the contour c. 6 m below the burials. Six graves (filled rectangular pits with shallow sunken surfaces) c. 1.8 m long x 1 m wide all in N-S orientation. The single alignment or row of graves runs E-W for c. 14 m across the crest surface with a semi-regular spacing. Individual GRs are: 635591. 6027896; 635593. 6027897; 635597. 6027898; 635600. 6027900 (with stone marker); 635602. 6027900; and 635606. 6027904 (with interval stone between this and adjacent grave, also a stone marker at the north end). Some ceramic fragments (white glaze with blue pattern) are evident on the ground surface directly below the graves. Ian Farrington (pers. comm.) suggests a high likelihood exists for additional Chinese interments in the immediate area. The crest between the identified burials and the highway corridor should be considered an area of archaeological potential in this regard.	Kiandra Gold Mining and Settlement
NC72	635624	6027934	Old fence. A fence line indicated by a posthole next to a water race at given GR and 7 m from the highway cutting. Vestiges of the fence alignment at 190/10° in the form of traces of straight and barbed wire continue upslope from the posthole.	Pastoralism
NC73	635569	6027931	Water race. An earth ditch c. 1.6 m wide x 40 cm deep contouring roughly at 70/250°. The feature commences next to the cemetery entrance track at given GRs and continues across local basal crests and spur features. The race is evident in the local creek gully for a length of c. 30 m. Continuation to the east is apparent paralleling the cut of the modern highway with some impacts occurring from the highway cut (eg. 635741. 6027918 – 635776. 6027902). The race intersects with another feature (running at 130/310°) at 635669. 6027932 and continues into the Eucumbene River valley mine workings to 636283. 6027755. Water race runs from Cemetery Gully to the Eucumbene River valley.	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
NC74	635580	6027930	Survey mark. Snowy Hydro benchmark and datum. Marked as '16/51'. Square tapered concrete plinth 16 cm x 16 cm at top and 18 cm x 18 cm at base x 28 cm high with bronze marked protruding central datum point 16 m from modern highway.	Miscellaneous
NC75	635571	6027935	Mining. Workings along Permanent Creek gully associated with gold mining. Extent on south side of the highway from 635571. 6027935 to 635433. 6027988 and along north side of the highway from 635440. 6028005 to approx. 635967. 6027904. Some tailings mounds at 635884. 6027931 exhibit careful placement and order, forming very straight margins, edges and precise margins within a background of generally amorphous mounds. Identified in Gant Thompson as pan and cradle workings.	Kiandra Gold Mining and Settlement
NC76	635442	6028024	Artefact scatter. A localised concentration of brown ware glaze ceramic over an area of c. 3 m x 50 cm on a skeletal rocky surface of a spur side. The scatter appears to consist of the remains of a single thick-walled vessel. Located c. 18 m from modern highway. Possibly Chinese ceramic.	Kiandra Gold Mining and Settlement
NC77	635442	6028025	Survey peg. Wooden survey peg 10 cm x 10 cm x 10 cm high and burnt.	Miscellaneous
NC78	635434	6028028	Water race and workings. A race c. 1.5 m wide x 50 cm deep running at 285/105 ° (eastern extent at given GR c. 16 m from highway). The race extends to the west to GR 635277. 6028090. Shallow workings are evident along the northern edge of the highway (635414. 6028028 to 635285. 6028084) and extending back c. 20 m to the race. The workings are cut unevenly into the crest with some channelling and water management connected to the race. Additional intersecting races appear to occur further to the north and outside the survey corridor. Two fragments of clay pipe exhibiting decorative ribbing are exposed on the southern wall of the water race at 635362. 6028067.	Kiandra Gold Mining and Settlement
NC79	635261	6028072	Old road. A shallow grade dirt track c. 4 m wide intersecting with the modern highway at given GR. Oriented 150/330° and runs towards creek gully.	Transport
NC80	635256	6028071	Water race. An earth ditch c. 2 m wide x 20 cm deep oriented 200/20°. Runs from intersection with modern highway at given GR and continues into adjoining terrain. Identified by Gant Thompson. Faintly defined.	Kiandra Gold Mining and Settlement

ID	Easting	Northing	Description	Theme
NC81	635275	6028065	Water race. Earth ditch c. 2 m wide x 40 cm deep oriented 130/310°. Intersects with highway at given GR and continues into adjacent highway angling away from road.	Kiandra Gold Mining and Settlement
NC82	635306	6028050	Water race. Earth ditch. 2 m wide x 50 cm deep oriented 190/10°. Intersects with highway at given GR. Previously identified by Gant Thompson.	Kiandra Gold Mining and Settlement
NC83	635307	6028049	Water race. Earth ditch, slightly indistinct, c. 1.5 m wide x 20 – 30 cm deep and extending for c. 120 m (into creek gully at 635410. 6027993). Oriented 110/290°, parallels modern highway along south side and running above cut. Intersects with a 210/30 degree oriented faintly defined race at 635388. 6028008 near edge of road cut. Located c. 4 – 10 m from the edge of the highway.	Kiandra Gold Mining and Settlement
NC84	635400	6028086	Hut site. Stone walled earth platform c. 4 m x 3 m with a possible hearth at the south east corner composed of slightly mounded earth and local stone. Old rusted dinner/butter knife lies on adjacent surface. Old butchered bone, glass and tin are exposed in rabbit digging downslope c. 35 m away at 635434. 6028087.	Kiandra Gold Mining and Settlement
NC85	636391	6027776	Stone alignment. Possible lockspit/claim marker running along the edge of a heavily worked creek line. Consists of closely spaced or abutting small boulders c. 3 m long x 25-45 cm wide in 85/265° orientation. Located c. 17 m from modern highway.	Kiandra Gold Mining and Settlement
NC86	636351	6027775	Hearth. Closely spaced and purposefully placed country rock stones in a rectangular form with solid infill and earth. Dimensions c. 2.1 m x 1.7 m WSW/ENE long axis. Occurs in an otherwise 'rock free' elevated and level area at the edge of workings. No immediately apparent platform but perhaps indicative of a NNW/SSE oriented hut structure. Located c. 9 m from modern highway.	Kiandra Gold Mining and Settlement
NC87	636269	6027797	Stone alignment. Possible lockspit/claim marker at the edge of a dry elevated patch adjacent to a heavily worked drainage line. The alignment is 2.2 m long and consists of local small boulders. The surface setting is otherwise free of rocks. Located 17 m from modern highway.	Kiandra Gold Mining and Settlement
NC88	635688	6027927	Fence. A vestigial alignment of remnant wire with no posts running at 90/270°. Consists of straight and barbed wire with sheep mesh, some alignments of basal	Pastoralism

ID	Easting	Northing	Description	Theme
			stones are apparent at points. The fence parallels the modern highway c. 9m from the road cutting and follows the water race feature NC73. It is likely that the fence connects with the corner post identified at site NC72. Runs from near the old cemetery eastwards to the Eucumbene River valley at 636262. 6027765.	
NC89	635722	6027904	Possible cuttings. Two possible platforms or workings with rectangular form c. 4 m x 2 m x 50 cm deep at given GR and 5 m x 2 m at 635735. 6027902 (eroded with a piece of metal on surface). Located c. 30 m upslope from highway.	Kiandra Gold Mining and Settlement
NC90	636230	6027768	Mine workings. Mined river valley landscape. Extends along the south side of the highway from 636230. 6027768 to the Eucumbene River at 636651. 6027783 and along the north side of the highway from 636178. 6027814 to the Eucumbene River at 636646. 6027794. The workings occur in the lower reaches of Permanent Creek and into the adjoining major river valley. Varying forms and stages of gold mining are apparent including dredging of the alluvial flats flanking the river.	Kiandra Gold Mining and Settlement
NC91	636340	6027739	Costeans. Two ditches; one c. 2 m x 1.4 m x 70 cm deep at given GR and one of comparable dimensions at 636311. 6027741.	Kiandra Gold Mining and Settlement
NC92	636424	6027743	Old road. An old dirt road or track c. 3 m wide oriented 210/30°. Appears to have been gated and sign posted as steel pipe posts have been rammed/set at the entrance (gate and signage?). Two boulders also appear to have been placed at this point. Identified as 'T27' by Gant Thompson.	Transport
NC94	636650	6027793	Old bridge. Remnants of the old timber bridge over the Eucumbene River. Apparent on the west bank of the river on the north side of the modern highway bridge span. Include two large hardwood posts connected with a heavy iron pin. The posts are driven into the riverbed and bank.	Transport



Plate 50 Kiandra: NC49 looking north; note Kiandra Courthouse to right.



Plate 51 Kiandra: NC51 looking south; note Matthews Cottage to left.

7.2.27 Nungar Creek Trail

The field survey at Nungar Creek Trail survey area has been subject to a reasonably comprehensive field survey over three days in February 2019. This survey extends from Wares Hut and campground near Tantangara Road, westward to the Snowy Mountains Highway/Link Road intersection at Kiandra.

The development footprint is within existing roads (except for the far eastern end which is uncleared forest) and the area is open grassland and woodland. The landscape is generally gently undulating and comprised of frost hollow valleys and forested slopes. It falls within the old Tantangara run area used for summer grazing until the 1960s.

In all Nungar Creek Trail survey units, vegetation frequently posed a constraint; visibility of ground surfaces was often absent except for the fire trail exposures. Ground exposures were generally negligible.

The historic items previously recorded in the Nungar Creek Trail area are listed in Table 59. These are all Kosciusko Huts Association listings. There are no sites of State or local significance present in the survey area.

The potential historic items recorded at during the field surveys are listed in Table 60. The historic items within the Nungar Creek Trail area relate to the themes of pastoralism, mining or recreation.

It is noted that the Wares Hut ruin site, as listed by the Kosciusko Huts Association, while located outside the development footprint, nevertheless could not be found during the field assessment; it is assumed that impacts would not occur to this item. The Wares Hut horse camp is a large cleared area in active use as a recreational camp site for horse riders and while listed by the Kosciusko Huts Association, is not however considered to be a potential heritage items for the purposes of this assessment.

Table 59 Nungar Creek Trail: Previously listed historic items.

KHA id.	OEH id.	s170	Easting	Northing	Name	Description	Theme
2614			646260	6028560	Horse camp (Wares Yards)	Modern camping ground	Recreation
299			646150	6028455	Wares Hut	Building site/ruin	Pastoralism
22			643165	6029529	Boggy Plains Hut (Tantangara) c 1920-70	Site of corrugated iron stock hut ~6 x 8 m, possibly built by WV Schiller who held a lease on Boggy Plain in the 1920s. Marked by a stone hearth and bedframe. This site is identified as a part of NCTSU2/H1; see below.	Pastoralism
5068			643186	6029523	Well c 1920-70	Possible well – dug out indentation in ground approximately 50 cm deep. This site is identified as a part of NCTSU2/H1; see below.	Pastoralism

Table 60 Nungar Creek Trail: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
NCTSU2/H1	643171	6029523	Boggy Plain Hut Complex inclusive of KHA ID 22 and KHA ID 5068. Located c. 39 m south west of track on a level bench of a simple slope. Remnant hut remains and a nearby dugout depression. Corrugated iron scatter over an area c.12 m [NS] x 14 m [EW]. The hut site measures c. 6 m [EW] x 4 m [NS]. Many rusted corrugated galvanised iron sheets scattered across the site area with average size of 2.4 m long x 75 cm wide. Many other artefacts are scattered on the surface including a cast iron bed frame [79.5 cm x 195 cm]; rock pile [2 m wide x 3 m long] in centre of iron scatter - most likely the remains of a collapsed hearth oriented EW; three rusted tins; a burnt wooden post, some iron bolted together using cup head bolts now lying on ground directly south of centre rock pile - ? collapsed back wall of hut; many of the corrugated iron sheets are folded along long edges and bare holes; a dirt pile c. 1 x 2 m is located at the end of the collapsed bolted iron sheeting and south of the centre rock pile. Two old dead	Pastoralism

ID	Easting	Northing	Description	Theme
			tree remains located further south of hut site. The bolted sheets of iron are lying with nuts facing up and directly adjacent to hearth rock pile, appears to be a wall and if so, means the front of the hut was north facing with a view over Boggy Plain. A dug-out depression, possibly an infilled well, located c. 15 m east of the hut and measures c. 6 m x 6 m with spoil on eastern downslope margin. The depression has rusted tins, brown glass fragments, burnt piece of milled timber and embedded plain wire. The site is believed to be aged c. 1920 -1970. The potential for associated relics is predicted to be high.	
NCTSU2/H2	643181	6029558	Old fence. Located on the same landform as NCTSU2/H1 Boggy Plain Hut site and c. 15 m southwest of track. Heavy gauge plain wire tied in loop around a burnt branch of a big healthy snow gum. Wire continues to the other side of track at 643201.6029604 and possibly may have been originally tied to burn tree remains. No visible fence posts. Wire is aligned 10/190°. Site condition if very poor. Fence in very poor condition. The age of the fence is uncertain but likely to be early to mid 19 th century.	Pastoralism
NCTSU4/H1 (Plate 52)	642727	6030983	Excavated depression located north east of vehicle track. The site is close to the break of slope of a terminal spur crest. Pit measures 9 m [NS] long x 6 m wide x 1.2 m deep. Pit is deeper at southern end and spoil is banked along southern margin. Western wall is vertically cut along top edge. Unknown function, age or purpose.	Miscellaneous
NCTSU9/H1 (Plate 53)	641784	6032789	Old fence line. Post located 20 m south west of Alpine Creek Trail. Fence aligned 10/190° with c. 3 m spacings between posts. A line of rocks of at least 5 small boulders are aligned along base of fence line between posts located adjacent to creek. Post 1: 641784.6032789 - 5 m south east of creek; crude split post 110 x 13 x 17 cm; sheep netting/barb/2 x heavy gauge plain wire. Fence continues across other side of creek with 6 visible standing posts ongoing down onto Boggy Plain. Post 2: 641797.6032825 - 111 x 15 x 17 cm; 3 drilled holes and one top barb. Post 3: 641802.6032839 - small round post-split in half; 103 x 25 x 12 cm; large chicken wire style mesh tied onto plain wire with thin short pieces of soft tie wire. Post 4: 641801.6032842 - post lying on ground. Post 5: 641802.6032845 -	Pastoralism

ID	Easting	Northing	Description	Theme
			115 x 19 x 14 cm. Post 6: 641803.6032850 - burnt and on ground. Post 7: 641807.6032851 - 110 x 18 x 16 cm. Post 8: 6441808.6032853 - lying on ground. Fence in very poor condition. The age of the fence is uncertain but likely to be early to mid 19 th century.	
NCTSU16/H1 (Plate 54)	638175	6031525	Old track. Located on west and north west side of Nungar Creek Trail. Old vehicle track paralleling c. 2 m west and north west side of current vehicle track. c. 2.5 - 3 m wide and c. 30 cm deep. Old track is overgrown with grass, heath and low shrubs. Becomes indistinct and appears to diverge towards the south west at 637986.6031286 taking a rough heading of 215/35° away from current track alignment. At 637887.6031197, the old track is 20 m west of current track and cut into landscape surface. It then gently curves back to merge with current track at 637833.6031124 near a drainage line. Diverges slightly and parallels current track from 637813.6031101 heading south west. Twin wheel rutted form up crest side, 6 m from current track at 637678.6031009. Mature snow gum growing in road at 637631.6030970 [indicates minimum age] 18 m from current track. At this point old track diverges from current track, heading 220/40° through natural pass or saddle. Even grade cut and surface section here. Becomes indistinct with more mature trees growing in alignment in saddle. Likely to have ceased use by 50 years ago. Old track continues into SU15 at 638990.6031862. At 639023.6031884 old track is roughly aligned 50/230° and travels on the east south east side of existing track and continues across crest onto plateau proper of open grass/heathland. Current road intersects old track at 638990.60318862. Section of old track highly disturbed from previous grid reference to 638861.6031812 becoming indistinct. Old track is better preserved towards the south west end. Areas of old track cut into bank. Old track points: 638842.6031806; 638627.6031725; 638227.6031590 [well preserved at this point with both banks cut down to c. 30 - 40 cm deep and 4 m wide. Sections along old road highly eroded down to c. 1 m deep. Track alignment part of the Kiandra – Tantangara Track c. 1850 (as per KHA tracks GIS).	Transport

ID	Easting	Northing	Description	Theme
NCTSU16/H2	638118	6031436	Old fence. Fence aligned 110/290°, crosses vehicle track and extends well into adjoining terrain. All remains within survey unit comprise of fallen posts and collapsed wire. Standing posts apparent in distance both sides. Remnants are vestigial but well indicative of alignment. Appears to be split hardwood posts approximately 1 m high x 20 cm x 12 cm thick. Plain wire and sheep/dog mesh with barb. Spacing appears to be 10 ft. Some posts drilled for wire. Strainer post/gate post at 638118.6031436 and located west side of track. Only fragmentary wire for some distance on east side. Old gate post 10 m to south southwest next to track on a rollover [relocated?] at 638109.6031426. Age of fence uncertain. Likely to be early 20 th century.	Pastoralism
NCTSU22/H1	636156	6030062	Old tracks. Located near Nungar Creek Trail and 750 m east of Eucumbene River crossing. Confluence of three old tracks with the current vehicle track on crest. A single graded dirt track on the north side of the current vehicle track. Parallels current vehicle track and connects at 636156.6030062. Two graded dirt tracks connect with the current vehicle track on south side @ 636134.6030066. Features are graded to depth of c. 30 cm and are c. 3 m wide. Track alignment part of the Kiandra – Tantangara Track c. 1850 (as per KHA tracks GIS).	Transport
NCTSU23/H1	635647	6030016	Water race. Race cut by current vehicle track at 635647.6030016 and cut also by old parallel track on the south side. Slightly indistinct feature c. 1 m wide x 15 - 20 cm deep; 'contours' at roughly 125/305° to south and 290/110° to north. Impacted in immediate Nungar Creek Trail corridor by graded vehicle track and spear drain. Possible altered water management feature [channelled spring?] could be associated with race on north side of current track. Site condition is fair to good.	Mining
NCTSU23/H2	635632	6030007	Water race. Water race c. 16 m downslope from race feature NCTSU23/H1. 'Contours' roughly parallel to upslope race - 310/130° to north and 138/318° to south. c. 1.5 m wide x 15 - 20 cm deep [appears filled in] with a well-defined downslope linear mound. Cut by current vehicle track and adjacent to an old track to the south. Condition is better than NCTSU23/H1.	Mining

ID	Easting	Northing	Description	Theme
NCTSU23/H3	635596	6029998	Costean. Located on north side of vehicle track. Costean/test pit and water management feature and drainage feature. Rectangular pit c. 1.5 m x 90 cm x 40 cm deep with compressed spoil along edges, potential enhanced/dug spring feature (?) c. 2 m to the north and measures c. 5 m x 2.5 m with drainage channel c. 11 m long at downslope end [channel c. 40 cm wide x 15 cm deep] curves to edge of vehicle track.	Mining
NCTSU23/H4	635608	6029985	Old track. Located south side of vehicle track. Old/former dirt track paralleling current vehicle track on south side. Section c. 138 m long from 635608.6029985 [W] to 635712.6030046 [E]. Dirt track c. 2.5m wide and cut [graded] to depth c. 30 cm although erosion on both planes has resulted in a roughened, wider and deeper feature. At furthest point c. 10 m from edge of current vehicle track. Site is in fair condition; overgrown, eroded and impacted at point by spear drains. Track alignment part of the Kiandra – Tantangara Track c. 1850 (as per KHA tracks GIS).	Transport
NCTSU23/H5	635583	6029971	Mining landscape. Located on south side of Nungar Creek Trail. Head of heavily mined/worked gully [sluicing] with associated landscape and features, commencing c. 2 m from south edge of Nungar Creek Trail. Appears to be upslope zone where expansive testing of deposits was taking place ahead of workings and the positioning of a water outlet [channel] to feed the workings [flume at head of gully]. Test pit at 635586.6029964 and 635573.6029934. Water channel at 635583.6029961. Water channel from 635563.6029950 to 635548.6029916 possibly channelling of water on north side of track, potentially feeding workings. Comprises upslope extent of workings described below at NCTSU23/H56.	Mining
NCTSU23/H6	635516	6029902	Gold mining landscape. Located along Nungar Creek Trail upslope and east of Eucumbene River. Current vehicle track cuts through landscape heavily altered by what appears to be multi-phased surface workings. Continuous remnants flank both sides of vehicle track. Includes shallow workings, water management including channelling tailings mounds [manifests as concise and elongated stone mounds, ditching, hummocky ground, bare/eroded surfaces, levelled and	Mining

ID	Easting	Northing	Description	Theme
			excavated alluvial deposits flanking river]. Extends from eastern side of Eucumbene River and upslope c. mid-slope at given grid references.	
NCTSU23/H7	635445	6029825	Old fence. Fence line aligned 100/280°; 6 plain wires and one barbed wire, split and drilled hardwood posts. Rabbit wire netting at base. Standing posts on west side of track commence c. 35 m from track and extend into adjoining paddock, all remains in survey corridor west of track are fallen posts and collapsed wire. Some base stones placed along rabbit wire. Single standing post on east side @ 635456.6029818 c. 5 m from vehicle track with collapsed wire. Fragmentary wire and fallen posts to east. Posts c. 1.5 m long x 22 cm x 10 cm thick. c. 3 m (10 ft) original spacing. Three old cans and wire exposed by rabbit diggings 2 m downslope from fence at 635439.6029824.	Pastoralism
NCTSU24/H1 (Plate 55)	635427	6029778	Mining landscape. Located on flat between Eucumbene River and Highway/Link Road. Multi-phase gold mining landscape in valley bottom (Eucumbene River corridor) just upstream of Bullocks Head Creek and Eucumbene River confluence. Mostly manifested now as dredged workings. Denuded alluvial gravels, low mounding/ hummocky ground/linear and concise tailings mounds, ponding. Potential for subsequent sand/gravel mining associated with Snowy Scheme should be considered. NB. bulldozed track, possibly a continuation of Link Road alignment, cuts through the mining landscape, purpose unknown.	Mining
NCTSU24/H2	635408	6029776	Post. Located on Nungar Creek Trail, just above creek/ Eucumbene River confluence. Post is hardwood milled post or sleeper upright [1.55 m tall x 21 cm wide x 10 cm thick]. Single drilled bolt hole [25 mm diameter] located on post 104 cm above ground level. Bolt hole set in 5 cm x 5 cm squared chiselled recess 2 cm deep. Two shallow 'dummy-drilled' 2 cm holes on the trail side 62 cm from base and top. Function uncertain; doesn't seem that old.	Miscellaneous



Plate 52 Historic item NCTSU4/H1 looking 50°. Note Boggy Plain in the background.



Plate 53 Historic item NCTSU9/H1 looking 10°.



Plate 54 Historic item NCTSU16/H1 looking 180°.



Plate 55 Historic item NCTSU24/H1 looking 270°. Note the Kiandra mining landscape in distance beyond the highway.

7.2.28 Rock Forest

The field assessment at the Rock Forest survey area has been subject to a reasonably comprehensive field survey over a three day period in February 2019. However, an additional development area has since been added and is not yet surveyed. The Rock Forest survey area is private land on the south side of the Snowy Mountains Highway, immediately east of the Kosciusko National Park boundary.

The Rock Forest property is comprised of gently undulating terrain drained by Camerons Creek. The property is open grassland with some woodland and is currently used for grazing sheep and cattle.

There are no previously listed historic heritage items in the Rock Forest project area. The recorded historic heritage items in the Rock Forest survey area are listed in Table 61.

The property has been in the local Russell family for generations and comprises a portion of their landholdings. Ten potential historic heritage items were recorded during the field inspection, most of which relate to the theme of pastoralism. These include fences, an old horse-drawn bucket scoop and a small former paddock with old cultivation furrows and ridges. One possible pit (costean) was found, likely to relate to the theme of mining. Our historic research has failed to identify any former mining activity in the immediate area.

Table 61 Rock Forest: Potential historic items recorded during field survey.

ID	Easting	Northing	Description	Theme
CCSU1/H1	651348	6020991	Old pit, uncertain of function located in paddock to south west of highway corridor. Pit is c. 17 m south west of boundary fence paralleling Highway. Pit is located on a lower-lying microtopographic context on the side of a crest and measures c. 2 m x 2 m x 40 cm deep. Another shallow pit located c. 6 m to the east measures 1.5 m x 1.5 m x 20 cm deep, may be from a tree, origin of pit not clear.	Pastoralism
CCSU1/H2	651846	6020602	Excavation/scrape in paddock to west of highway corridor, on north side of Camerons Creek. Large mechanically scraped area on crest overlooking creek. Area c. 50 m x 40 m with shallow scalped zone c. 30 – 60 cm deep and located c. 20 m from fence along road corridor. Hummocky surface between scrape and fence, may indicate perimeter disturbance. Function unclear; possible gravel extraction point.	Pastoralism
CCSU1/H3 (Plate 56)	651765	6020731	Old fence. Located in paddock directly south west/west of highway with grid reference taken from eastern end of fence line. The fence is oriented 220/40°, constructed using split hardwood posts, drilled for plain wires and a single barbed wire at top. The fence is becoming fragmentary and has been augmented with star posts to help retain form. Top strand of barb is a simple shard end welded on barb. Roughly 2.2 m spacing between posts, though most are no longer embedded, rather suspended upright by wire. A modern fence runs parallel with small interval gap c. 80 cm between. Condition of fence is fair – well indicative of fabric and function.	Pastoralism
CCSU1/H4	651174	6021130	Old fence. Located next to gateway in paddock adjacent to road. Grid reference taken from eastern end of fence line. Still functioning fence – hardwood split posts and strainers, posts drilled for and strung with 5 plain wires and a single barbed wire at the top with rabbit mesh wire attached along lower section of fence. Fence line oriented 0/180°. Post spacings c. 2/2.2 m apart. Star pickets incorporated into fence line every 4 metres. Fence appears to have been restrung in more recent times. Some upgraded/modernised sections; continues into paddock to south. Old fence materials dumped next to upgraded section at 651153.6020981. Site condition is good and still in use.	Pastoralism

ID	Easting	Northing	Description	Theme
CCSU1/H5	651147	6020970	Horse-drawn bucket scoop. Located next to fence south of and near stock yards. Steel construction of moulded steel plate bucket with welded steel pipe/tube handle/frame. Heavy chain and hitching point welded to bucket point. Total overall measurements are 1.3 m long x 75 cm wide. Site condition is good.	Pastoralism
CCSU1/H6	650991	6020983	An accumulation/dump of large timber structural components. Hardwood beams [milled] 10 cm x 10 cm /23 cm x 10 cm x 4 m/6 m long. Drilled with 15 mm bolts. c. 23 beams lying parallel on flat surface (c. 35 m x 10 m). Also c. 6 large hardwood posts (and remnant sections) up to c. 9 m long x 35 – 40 cm diameter also with protruding 20 m bolts and 9 mm square pins. Appears to be an old bridge dismantled and transported to this location.	Miscellaneous
CCSU1/H7	650980	6020781	Old iron pipe. Located 3 m from edge of dirt track on west side in the trees. Rusted steel /iron pipe c. 2.5 m long x 22.7 cm diameter; flanged end; welded section. Twin bolted coupling using 15 mm bolts. Loose on surface. Unknown function and location – most likely out of context.	Miscellaneous
CCSU3/H1	650821	6021448	Costean pit. Located on crest in bushland south of Highway. Pit c. 2 m x 1 m x 40 cm deep in rocky ground on north end of low hill. Cobbles and boulders of coarse local bedrock in low mound around excavation.	Mining
CCSU8/H1	651754	6020142	A dump/collection area containing scattered steel/iron [plate, machinery components, pipe] and c. 8 lengths of steel rail [5 m x 115 mm] from a railway line. Function unclear. Possible source of post material?	Miscellaneous
CCSU9/H1 (Plate 57)	651735	6019947	Old cultivation paddock in drainage depression, upper reach above dam. Partially fenced [originally enclosed] cultivation paddock with fence line remnants on south and west boundaries. WNW/ESE trending ridge and furrows c. 110 cm wide [ridge] x 40 cm wide [furrow]. East and north fences no longer standing, but postholes and edge of ridges provide good indication of extent. Paddock c. 40 m x 85 m. Appear to be gateways at south east and north west corners. South fence line c. 85 m long; 290/110° orientation. Hardwood strainers, iron 'drill/twisty' posts at 3 m spacing [occasional hardwood post] single barb at top and plain wire and ring lock below. Height 1.25 m. West fence line c. 40 m long, aligned 14/194°, comprised of star pickets and three barbs. Site condition is good with plenty of scope for mapping.	Agriculture



Plate 56 Historic item CCSU1/H3 fence looking 210°.



Plate 57 Historic item CCSU9/H1 old cultivation paddock looking 270°.

8. HISTORIC HERITAGE ITEMS EVALUATION

8.1 METHODS

Understanding the heritage significance of an item, place or landscape is integral to the process of assessing potential heritage impacts and developing appropriate management and mitigation strategies. The nature and extent of potential heritage impacts cannot be determined without first establishing heritage significance.

Within Australia, the *Australia ICOMOS Burra Charter, 2013* (Australia ICOMOS 2013) is the principal document that sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance. Within NSW, there are a series of documents that specify the criteria and guidelines for assessing heritage significance. The NSW heritage assessment criteria, which are set out in the HO&DUAP (2001) publication *Assessing Heritage Significance: a NSW Heritage Manual update*, encompass the various types of heritage values identified in the *Burra Charter*, which include historical, aesthetic, scientific, social and spiritual significance. Other publications relevant to the process of assessing heritage significance in NSW include the following:

- *New South Wales Historical Themes* (NSW Heritage Council 2001), which sets out relevant historical themes with reference to the national historical theme framework (AHC 2001);
- *Investigating Heritage Significance: draft guideline* (NSW Heritage Office 2004), which outlines procedures for background research, undertaking community consultation, investigating fabric and managing significance;
- *Levels of Heritage Significance* (NSW Heritage Office 2008), which provides supplementary guidance on establishing whether a place or object is of local, state, national or world significance; and
- *Assessing Significance for Historical Archaeological Sites and 'Relics'* (NSW Heritage Branch 2009), which provides updated summaries of the heritage significance criteria, significance rankings, levels of significance and the application of these concepts to archaeological sites.

The significance assessment process implemented for the project has been undertaken in accordance with the guidelines and principles contained in the abovementioned documents. The individual NSW heritage significance criteria are provided below in Table 62. All recorded items within or adjacent to proposed impacts have been assessed against these criteria. Table 63 outlines the standard rankings of significance used in NSW. This system of developing a hierarchy of significance has been used to assist in understanding and assessing the relative contributions of individual items to the overall significance of complexes and landscapes.

Table 62 NSW Heritage Act 1977 heritage assessment criteria (NSW Heritage Branch 2009: 3).

Criterion (a)	An item is important in the course, or pattern, of NSW's cultural or natural history (or the local area).
Criterion (b)	An item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the local area).
Criterion (c)	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).
Criterion (d)	An item has strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the local area).
Criterion (e)	An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the local area).
Criterion (f)	An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the local area).
Criterion (g)	An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments (or the local area).

Table 63 Hierarchy of significance (NSW Heritage Branch 2009: 4).

Grading	Justification	Status
Exceptional	Rare or outstanding item of local or State significance. High degree of intactness. Item can be interpreted relatively easily.	Fulfils criteria for local or State listing
High	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance.	Fulfils criteria for local or State listing.
Moderate	Altered or modified elements. Elements with little heritage value but which contribute to the overall significance of the item.	Fulfils criteria for local or State listing.
Little	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for local or State listing.
Intrusive	Damaging to the item's heritage significance,	Does not fulfil criteria for local or State listing

Many of the items identified in the course of this investigation are either archaeological sites or comprise components of archaeological potential. As such, the process of assessing significance and determining contributory significance is primarily reliant on predicted rather than known attributes. It is acknowledged that, without undertaking test excavation, there remains a degree of uncertainty regarding the heritage significance of items that comprise potential archaeological deposits. The significance assessment process has taken this into account in the following ways:

- a) Detailed historical research to establish relevant themes as well as specific individuals, events, groups, processes, technologies and activities associated with specific locations and items;
- b) Assessment of identified fabric in terms of abilities to demonstrate historical themes and evidence of particular processes, technologies and activities;
- c) Physical and documentary assessment of land use, geomorphology and other factors pertinent to site integrity; and
- d) Comparative assessments with relevant examples of objects, places and landscapes associated with particular historical themes, processes, technologies and activities.

Through this multi-faceted approach to establishing historical associations, assessing site condition and archaeological potential, and comparative analysis to assess rarity and representativeness, the archaeological potential of items and their potential significance against individual heritage criteria has been graded. For example, in order for a site to be assessed as having research/scientific value, it must first be established that it has significance in terms of historical associations and/or an ability to address research questions related to specific individuals, events, groups, processes, technologies or activities. Furthermore, consideration has been given to whether or not a site displays signs of good subsurface integrity, and the degree to which it is a rare or representative example of its type.

This information has then been used to rank the archaeological potential of items in a similar way to which gradings of significance are set out in Table 64. The process and rationale behind this archaeological ranking are summarised in Table 64.

Table 64 Archaeological hierarchy of significance.

Grading	Justification	Status
Exceptional	Rare and/or highly representative example of its type that displays a high degree of integrity. Strong and/or important historical/ social/spiritual associations have been confirmed. The site is likely to be able to yield information that will address important research questions.	Fulfils criteria for local or State listing

Grading	Justification	Status
High	Site displays a high degree of integrity. Strong and/or important historical/social/spiritual associations are likely or have been confirmed. The site is likely to be able to yield information that will address important research questions.	Fulfil criteria for local or State listing.
Moderate	Site integrity is unclear and/or partially compromised. The extent to which the site is able to yield information that will address important research questions is unclear.	Fulfil criteria for local or State listing.
Little	Site displays low levels of integrity. Strong and/or important historical/social/spiritual associations are unlikely, or the site is otherwise unlikely to yield information that will address important research questions.	Does not fulfil criteria for local or State listing.
Negligible	Site displays little or no integrity. No identifiable strong and/or important historical/social/spiritual associations.	Does not fulfil criteria for local or State listing

8.2 ANALYSIS

The following sections include significance assessment tables for each survey area that include assessments of groups of items by theme, and where appropriate, further grouped by proximity into site complexes. The tables provide discussions of how each group of items, and/or individual items, have been assessed against each criterion and assessments of whether they have State or local significance. This is then followed by an overarching statement of significance for each group/item that summarises the local/state importance of the items. In instances where the group/item does not meet any of the heritage criteria, the statement of significance reads “does not fulfil criteria for local or State listing”.

An overview table is also provided for each survey area detailing the different hierarchies of significance for each item in terms of their contributory significance to the broader cultural landscape and, where relevant, their archaeological significance rankings. These hierarchy tables are similarly arranged in accordance with the thematic/complex groupings discussed above. The primary purpose of these tables is to rank the significance of all items, including those of contributory value only, and to assist in the formulation of holistic statements of significance for each survey area. The significance assessments and gradings are also further discussed in subsequent sections with relation to impact assessments and development of appropriate mitigation measures within a particular survey area.

8.2.1 Lobs Hole Ravine

The historical heritage items recorded at Lobs Hole Ravine relate primarily to the Ravine township and copper mining. A significance assessment of the Lobs Hole Ravine heritage items is presented in the tables below.

Table 65 Overview of significance assessment for heritage items at Lobs Hole Ravine.

Ravine Township	R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R39, R59, R60, R61, R121, R122. These items include the pisé ruins of the Washington Hotel and associated stables, buildings and associated hearths, yard fences, possible cesspits/privies, remains of the Lobs Hole police station and associated stables.
Criterion	Assessment
a	This group of items comprises key elements of the core township of Ravine, including the Washington Hotel (R20), associated outbuildings and stables (R21 and R28), police station and associated infrastructure (R25, R60 and R61), store (R26, R27 and R39), as well as various other associated features (e.g. suspected borrow pit and more ephemeral dwelling sites). Collectively, these items are important within the context of the development of the township, which itself was integral to the success of the Lobs Hole Copper Mine. These items are collectively assessed as having local significance against this criterion.
b	Many of the identified items are directly linked to individuals who were important in the history of Ravine. Examples include the Washington Hotel and associated infrastructure (R20, R21 and R28), which is directly associated with the life and works of Julius Forsstrom; who is renowned for his pub and for the nearby copper mining operation that he was involved with. Other examples include the police station remains (R25, R60 and R61) and the remains of the store (R26, R27 and R39). These items are associated with key individuals in the township. These historical associations are very much at a local scale. Nevertheless, they demonstrate that the remains of the Ravine Township core are very closely associated with some of the key figures in its history. These items are collectively assessed as having local significance against this criterion.
c	The western end of the Lobs Hole Valley is renowned as a landscape with both natural beauty and remnants of historical features that range from subtle through to landmark quality. Collectively, the remains of the Ravine township core form an important component of the landscape of Lobs Hole that displays both cultural and natural aesthetic characteristics. These items are collectively assessed as having local significance against this criterion.
d	The Ravine township, and the broader locality of Lobs Hole, have ongoing special associations with at least two communities/groups: descendants of the town inhabitants (e.g. the Thomas family, Forsstrom family and Yan family) and recreational users of KNP. Connections to the first group are more typically evidenced through local histories and newspaper articles. Whereas the importance and connections to recreational users tends to be evidenced more through blog pages and/or social media posts. Overall, there is sufficient evidence to suggest that the Ravine township and the broader locality of Lobs Hole has special/strong associations with known

	communities/groups because of both its natural qualities and the presence of tangible evidence of its history.
e	The majority of items in this group fall into one of three categories: demonstrated research potential, as evidenced through the salvage program for the early works (e.g. R21, R26, R27, R28, R39, R60, R61, R121 and R122); items with clear research potential (e.g. R20); and items with suspected research potential (e.g. R23). The group as a whole has either demonstrated potential or a likely potential to yield information unavailable in known historical records, that will contribute to an understanding of the construction of buildings; commerce practised; life in Ravine at the beginning of the twentieth century and/or demographics of the population within the town. Individually, and as a group, these items are assessed as having local significance against this criterion due to their archaeological research potential.
f	Many of the items within this group have already been subject to archaeological excavation and/or direct impacts from the Early Works for Snowy 2.0 (e.g. R21, R26, R27, R28, R39, R60, R61, R121 and R122). As such, the remaining elements of the core township now form a rare and/or endangered set of items with recognised local heritage significance against one or more of the NSW heritage criteria. The remaining extant elements of Ravine township (in particular R20), together with the assemblages recovered during Early Works salvage, are assessed to have local significance against this criterion as the only remaining evidence of the former township. R20 also has significance against this criterion as a relatively rare example of pisé construction in KNP and as one of the largest pisé buildings of its time in Australia.
g	The extant remains of the township, together with the information and assemblages recovered from sites salvaged during Early Works are representative of a short-lived town that developed in association with a copper mine. They are also representative of the archaeology of turn of the century towns within the KNP, of which the only other similar extant example is Kiandra. As such, the remaining extant features (e.g. the Washington Hotel at R20) and the salvaged assemblages, are representative of life in a remote settlement within the Snowy Mountains that is poorly documented in traditional historical sources. This group is assessed to have local significance against this criterion.
Statement of Significance	This group of items has clear importance within the context of the development of the Ravine township and its role within the context of the brief success of the Lobs Hole Copper Mines. Many of the items are directly associated with individuals/families of local importance at Ravine (e.g. Julius Forsstrom, Adolf Reeckmann). They also have ongoing special associations for descendants of families who lived at Lobs Hole and form part of a broader landscape that continues to have strong and special associations with modern recreational users of KNP because of the tangible evidence of the place's history. The remains of the township core are also key components of a broader landscape that is recognised for the interplay between its natural and cultural elements, and they include the remains of the Washington Hotel, which is itself a landmark feature on the banks of the Yarrangobilly River. This group of items also has demonstrated research potential. The remaining extant features, together with the information and assemblages recovered during salvage for the Early Works have considerable potential to contribute to an understanding of a poorly documented aspect of the history of the Snowy Mountains. In particular, they have potential to shed light on the lives of

	individuals who are not typically well represented in the historical record (e.g. women and children in a remote rural town). This group of items has already been subject to high level impacts. As such the remaining extant features and the assemblages salvaged from sites impacted by the early works form the only physical evidence of this particular aspect of Ravine. Finally, the items in this group form a representative example of the types of archaeological sites and assemblages from a turn of the century town in a relatively remote valley within the Snowy Mountains. The extant items, together with the assemblages recovered from salvaged sites are assessed as having local significance against criteria a, b, c, d, e, f and g.
Greater Ravine Township	R31, R41, R42, R47, R63, R64, R66, R71, R113 includes the old school site, roads, garden remains, artefact scatters, a water race on Rose Cook's property, building platforms and foundations, Yan's sheds.
Criterion	Assessment
a	This group comprises buildings spread out between the main ravine township and the Lobs Hole Copper Mine. This includes buildings essential to the longevity of the town including the school building and gardens as well as a possible reverberatory furnace. As such, the cultural remains in the Greater Ravine Township have contributory significance against this criterion.
b	This group comprises buildings spread out between the main ravine township and the Lobs Hole Copper Mine. These sites provide insight into the families at Lobs Hole and how they functioned in a remote location. As such, the cultural remains in the Greater Ravine Township have local significance against this criterion.
c	While these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of the broader landscape of settlement in Ravine. Ravine is renowned for the presence of relics relating to the Lobs Hole Mine, and the remnant features from that period form an important component of the landscape of Ravine. As such, the cultural remains in the Greater Ravine Township have potential local significance against this criterion.
d	The Ravine township, and the broader locality of Lobs Hole, have ongoing special associations with at least two communities/groups: descendants of the town inhabitants (e.g. the Thomas family, Forsstrom family and Yan family) and recreational users of KNP. Connections to the first group are more typically evidenced through local histories and newspaper articles. Whereas the importance and connections to recreational users tends to be evidenced more through blog pages and/or social media posts. In particular this is relevant to R47 (the old school building) and R71 (reverberatory furnace and dwelling), and R113 (Yan's Sheds). Overall, there is sufficient evidence to suggest that the Ravine township and the broader locality of Lobs Hole has special/strong associations with known communities/groups because of both its natural qualities and the presence of tangible evidence of its history. As such, the cultural remains in the Greater Ravine Township have local significance against this criterion.
e	These sites contribute to a broader understanding of cohesion and functionality of community particularly in a remote location. These items include the remains of a school building, a garden comprising apple and periwinkle trees, roads, artefact scatters, and various building platforms and other structural remains. Excavation during the early works at some of these features has confirmed the research potential that exists at these

	sites. It is likely that other remains including building platforms have the potential to contribute more information than the historical literature has alluded to. As such, the cultural remains in the Greater Ravine Township have local significance against this criterion.
f	Sites in a gazetted township within a national park are rare. Kiandra is one of the other few examples, but many other towns from a similar time period in or near the KNP are disappearing. Old Jindabyne and Old Adaminaby are examples of this. Whilst another example of a gazetted township does exist nearby in Kiandra, the remains of Ravine are a relatively rare example of this site type within the KNP and they are a site type that is endangered within the context of the history of impacts associated with development of the Snowy Mountains Scheme. As such, the cultural remains in the Greater Ravine Township have local significance against this criterion.
g	Whilst none of these sites are in and of themselves good examples of any given site type, collectively they represent different types of habitation and infrastructure around the outskirts of the township. Further, they represent various types of archaeological remains as well as their form or state of disrepair. Collectively, the sites around the outskirts of the Ravine Township have potential local significance in terms of the layout of the town and the condition of the sites.
Statement of Significance	These sites contribute to the understanding of the Ravine Township as a whole. They provide insight into the families of the workers at the Lobs Hole Copper Mine and how they adapted to living in this environment. Archaeological potential as demonstrated by the excavations at R71 is quite high and contributes to a deeper understanding of how the families and inhabitants of Lobs Hole built and sustained the township of Ravine. Some of these sites also illustrate the dearth of knowledge relating to these how these buildings were used and what they contributed to the community and hence must be investigated archaeologically in order to understand their importance. The features recorded at Struggle Street are assessed as having local significance against criteria b, d, e and f, contributory significance against criterion a and potential local significance against criterion c and g.
Struggle St	R48, R49, R50, R56, R57, R76, R104, R105, R106, R107, R108, R109, R110, R111, R115, R120, – These items include building platforms, horse whim, roads/tracks/paths, artefact scatters, and various earthworks along and around the Ravine settlement known as Struggle Street.
Criterion	Assessment
a	Struggle Street was part of the informal mining settlement that developed along the eastern margins of Lick Hole Gully, south of the Lobs Hole Copper Mine. The settlement was important within the context of the influx of workers for the mine, which itself was the impetus for the development of the town of Ravine. As such, the remnants and ruins of Struggle Street are assessed as having local significance against this criterion.
b	Struggle Street was part of the informal mining settlement that developed along the eastern margins of Lick Hole Gully, south of the Lobs Hole Copper Mine. This area of mining settlement is directly associated with the men who came to work in the mine. The mine workers were instrumental in the fleeting success of the mine. As such, the remnants and ruins of Struggle Street are assessed as having local significance against this criterion.

c	While these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of the broader landscape of settlement in Ravine. Ravine is renowned for the presence of relics relating to the Lobs Hole Mine, and the remnant features from that period form an important component of the landscape of Ravine. As such, the remnants and ruins of Struggle Street are assessed as having local contributory significance against this criterion.
d	There are no known strong or special associations between the remains of Struggle Street and a particular community or cultural group. However, the features in this area have the potential to be of importance to descendants of the people who worked in the Lobs Hole Mine. These items are assessed as potentially having local contributory significance against this criterion.
e	Struggle Street was part of the informal mining settlement that developed along the eastern margins of Lick Hole Gully, south of the Lobs Hole Copper Mine. The identified features in this area include the remains of tracks, building platforms and a horse whim. Survey and excavation of these features would potentially yield information that would contribute to an understanding of the layout and form of this settlement, which could then be compared with other types of settlement across Ravine and nearby mining settlements such as Kiandra. On the basis of the preliminary results of excavations at other sites in Ravine, it is likely that these features would provide information relating to the nature of settlement (temporary versus sustained dwellings), types of materials and construction used, period of occupation, and information relating to the population demographics (e.g. the presence/absence of women and children). It is also likely that additional unrecorded features are present in this area as subsurface features and/or features partially obscured by vegetation. The remnants and ruins of Struggle Street are assessed as having local significance against this criterion.
f	Remains of mining settlements are a relatively common feature across the Snowy Mountains and NSW as a whole. Nevertheless, such features within Ravine have been impacted by the Early Works for Snowy 2.0, and the current proposal would result in a significant increase to the cumulative impacts across such sites at Ravine. As such, the remains of Struggle Street comprise a discrete area of early twentieth mining settlement that are becoming increasingly rare at Ravine and that may be lost to future generations. Furthermore, the horse whim is an example of a feature that is relatively little known as an extant feature within the local region. The remains and ruins of Struggle Street, particularly the horse whim, are assessed as having local significance against this criterion.
g	Struggle Street was part of the informal mining settlement that developed along the eastern margins of Lick Hole Gully, south of the Lobs Hole Copper Mine. The features present in this area are typical of such an informal mining settlement and collectively represent a range of different aspects of the settlement. The horse whim is also a good example of a site type that is not well documented across the Snowy Mountains. Collectively, the items present in and around Struggle Street have local significance as features that represent an informal early twentieth century mining camp.
Statement of Significance	Struggle Street was part of the informal mining settlement that developed along the eastern margins of Lick Hole Gully, south of the Lobs

	Hole Copper Mine. The features in this area form an important component of the mining settlement. They are directly associated with the lives of the individuals who enabled the mine to function. The features also contribute to the broader landscape of Ravine, which is renowned for the presence of historical ruins. Archaeological potential across many of the features is predicted to be quite high. Excavation and survey of these features has the potential to address numerous research questions relating to the nature, form and chronology of mining settlements at Ravine. The items are also collectively representative of early twentieth century mining settlement at Ravine, and are examples of features that are becoming increasingly rare within the valley. The features recorded at Struggle Street are assessed as having local significance against criteria a, b, e, f and g, contributory significance against criterion c and potential local significance against criterion d.
Pastoral items	R1, R3, R4, R15, R18, R35, R43, R65, R73, R92, R93, R97, R100, R103, R129
Criterion	Assessment
a	This group of items are associated with the West Pinbeyan Homestead and associated aspects of pastoral activities at Lobs Hole. They are important within the context of the pastoral occupation, which was the longest continuous aspect of non-Aboriginal settlement in the valley. The remains of West Pinbeyan Homestead, and the associated elements of that complex, are also important within the context of the mine manager's residence, and thus have importance within the context of the history of copper mining at Lobs Hole. This group of items is collectively assessed as having local significance against this criterion.
b	These items are associated most closely with the first phase (late nineteenth century) and last phase (early to mid-twentieth century) of non-Aboriginal settlement and occupation at Lobs Hole. There is a strong association between these items and the Yan family. The Yan family in particular was prominent in the local area, with close associations to Kiandra and Ravine, particularly in the context of ongoing occupation following the decline of mining activities. This group of items is assessed as having local contributory significance as a minimum and potential local significance against this criterion.
c	While these items are not generally notable in terms of their aesthetic or technical characteristics, they form part of a broader cultural landscape that is renowned for the interplay between cultural and natural features. Collectively, the pastoral items form an important component of the landscape of Lobs Hole that reflects aspects of settlement/infrastructure location and landscape modification that are integral to the aesthetics of the valley. These items are collectively assessed as having local contributory significance against this criterion.
d	Lobs Hole has ongoing special associations with at least two communities/groups: descendants of the town inhabitants (e.g. the Thomas family, Forsstrom family and Yan family) and recreational users of KNP. Connections to the first group are more typically evidenced through local histories and newspaper articles. Whereas the importance and connections to recreational users tends to be evidenced more through blog pages and/or social media posts. Overall, there is sufficient evidence to suggest that the remnants of pastoral occupation and the broader locality of Lobs Hole have special/strong associations with known communities/groups because of both the natural qualities and the

	presence of tangible evidence of the place's history. As such, these items have local significance against this criterion.
e	While many of the identified pastoral items are not associated with potential archaeological deposits, there are various building platforms in and around the former West Pinbeyan Homestead site that are likely to contain relics. Detailed survey of the items within this group, together with archaeological excavation of those features that demonstrate subsurface potential, is likely to yield information that will inform the chronology of different phases of occupation, differences in residential and infrastructural requirements associated with those phases, and details of life in a remote valley during the late nineteenth and early twentieth century. Collectively, these items are assessed as having local significance against this criterion.
f	Remains of pastoral complexes are relatively common across the Snowy Mountains and NSW as a whole. Nevertheless, such features within Lobs Hole/Ravine have been impacted by the Early Works for Snowy 2.0, and the current proposal would result in a significant increase to the cumulative impacts across such sites at Ravine. As such, the remaining elements of the pastoral landscape at Ravine are assessed as having local significance against this criterion.
g	While none of the items in this group are particularly good examples of their type, they do collectively contribute to the broader pastoral landscape. As such, they are assessed as having local contributory significance against this criterion.
Statement of Significance	The pastoral items identified at Lobs Hole, particularly those associated with the various phases of the West Pinbeyan Homestead, are important within the context of the history and phasing of non-Aboriginal settlement at Ravine. They are directly associated with the Yan family, who were prominent in local history at both Lobs Hole and Kiandra. The former homestead site is also closely linked with the copper mining activities within the valley. As a group, these items contribute to the aesthetic qualities for which the broader valley is renowned, and they have ongoing social significance for descendants of the residents of Ravine and recreational users of the KNP. The pastoral items that currently remain extant following the Early Works for Snowy 2.0 also form a set of features that are becoming increasingly rare and that demonstrate potential to contribute to an understanding of the different phases of pastoral occupation. This group is assessed as having local significance against criteria a, d, e and f, and local contributory significance against criteria b, c and g.
Mining items	R2, R5, R9, R10, R11, R12, R13, R14, R45, R46, R51, R62, R67, R68, R69, R72, R74, R75, R81, R90, R91, R96, R99, R112, R114, R117
Criterion	Assessment
a	This group of mining items includes elements that are clearly part of the Lobs Hole Copper Mine complex and items for which the exact historical association is unclear. While additional research into mine records is necessary for some of these items, as a group they are integral to the development of the settlement of Ravine and associated satellite settlements such as Struggle Street. Collectively, they are a key component within the pattern of the history of Lobs Hole. This group of items is assessed as having local significance against this criterion.
b	This group of mining items includes elements that are clearly part of the Lobs Hole Copper Mine complex and items for which the exact historical association is unclear. While additional research into mine records is

	necessary for some of these items, as a group there are clear connections with Reeckmann and Forsstrom, who are recognised as important figures within the history of Lobs Hole/Ravine. This group of items is assessed as having local significance against this criterion.
c	While many of these items may not be notable in terms of their aesthetic or technical characteristics, they form part of a broader cultural landscape that is renowned for the interplay between cultural and natural features. Moreover, the various mine shafts and mullock heaps are recognised as important components of the landscape of Lobs Hole that are integral to the aesthetics of the valley and the way in which it evidences the interplay between natural and cultural features. These items are collectively assessed as having local significance against this criterion.
d	Lobs Hole has ongoing special associations with at least two communities/groups: descendants of the town inhabitants (e.g. the Thomas family, Forsstrom family and Yan family) and recreational users of KNP. Connections to the first group are more typically evidenced through local histories and newspaper articles. Whereas the importance and connections to recreational users tends to be evidenced more through blog pages and/or social media posts. Overall, there is sufficient evidence to suggest that the mining features across the valley, and the broader locality of Lobs Hole, has special/strong associations with known communities/groups because of both its natural qualities and the presence of tangible evidence of its history. As such, the mining items at Lobs Hole have local significance against this criterion.
e	Although many of the identified mining items may not be directly associated with potential archaeological deposits, the complex as a whole displays considerable research potential. Detailed survey, together with archaeological excavation at those sites that display potential for subsurface relics, would contribute to an understanding of the different phases of mining and the associated technologies and techniques for identifying ore deposits, and extracting and processing ore. This would also contribute to a broader understanding of the different phases of settlement at Ravine and the effect of mining on those different phases. These items are collectively assessed as having local significance against this criterion.
f	Mining items are relatively common features across the Snowy Mountains and NSW as a whole. However, such features within Lobs Hole/Ravine have been impacted by the Early Works for Snowy 2.0, and the current proposal would result in a significant increase to the cumulative impacts across such sites. As such, the remaining elements of the mining landscape at Lobs Hole are assessed as having local significance against this criterion.
g	The mining items that comprise this group are collectively representative of small to moderate scale copper mining utilising a variety of ore extraction techniques. In particular, they are good example of the sorts of self-sufficient strategies (e.g. on-site brick kilns and ore processing) required to make a mining venture viable in such a remote and inaccessible location. These items are assessed as having local significance against this criterion.
Statement of Significance	The Lobbs Hole Copper Mine is an important component of the mining history at Lobs Hole. It has a strong association with Adolf Reeckmann and Julius Forsstrom, who were important in developing mining at Lobs Hole and as central figures in the Lobbs Hole Copper Mining Company.

	The identified items are integral components of the landscape at Lobs Hole, which is renowned for the interplay between cultural features (especially mining) and the broader natural landscape. These items also have ongoing social value for both descendants of the former inhabitants of the valley and modern-day recreational users of the KNP. Collectively, the identified mining items represent a mining complex that is becoming endangered at Lobs Hole and that is representative of copper mining in a remote/inaccessible area. The mining items also demonstrate research potential with an identifiable potential to contribute to an understanding of the different phases of mining and the associated technologies and techniques for identifying ore deposits, and extracting and processing ore. This would also contribute to a broader understanding of the different phases of settlement at Ravine and the effect of mining on those different phases. This group is assessed to be of local significance against criteria a, b, c, d, e, f and g.
Transport related items	R53, R84, R85, R86, R94, R95, R132 – remains of old tracks and roads.
Criterion	Assessment
a	The remnant portions of former tracks and roads that comprise this group do not form parts of known important transport routes. These items are assessed as not having significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or group of persons of local or state importance. These items are assessed as not having significance against this criterion.
c	These items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. They do however contribute to a landscape that is renowned for the interplay between natural and cultural landscape elements. These items are assessed as having local contributory significance against this criterion.
d	The items have no known strong or special associations with a particular community or cultural group. These items are assessed as not having significance against this criterion.
e	Portions of former road alignments are not generally recognised as items with significant archaeological research potential. Nevertheless, detailed survey of these features may contribute to an understanding of transport and communication networks at Lobs Hole. These items are assessed as having potential local contributory significance against this criterion.
f	Portions of former road alignments are common within the KNP. Such sites are also relatively common across the broader NSW landscape.
g	The remnant portions of former tracks and roads that comprise this group are not good examples of their type. They are assessed as not having significance against this criterion.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited research potential. Nevertheless, they do contribute to the broader cultural landscape of Lobs Hole. This group of items is assessed as having local contributory significance against criteria c and potential local contributory significance against criteria e.
Agriculture	R80
Criterion	Assessment
a	This item is thought to be the site of Elizabeth Frazer's (nee Thomas) orchard. The orchard is not known to be of particular importance in the

	history of Lobs Hole. This item is assessed as not having significance against this criterion.
b	This item is thought to be the site of Elizabeth Frazer's (nee Thomas) orchard. The Thomas family figures prominently in the history of Lobs Hole/Ravine. However, there is insufficient information available to fully assess the nature of the relationship between the orchard and the life of Elizabeth Frazer. As such, this item is assessed as having potential local significance against this criterion, pending further research.
c	There are no obvious extant remains of the orchard. As such, the item is assessed as not having significance against this criterion.
d	This item is remembered by the Thomas family descendants as being a place closely tied to one of their ancestors. It is also part of a broader landscape with both tangible and intangible social values for descendants of the populace of Ravine and recreational users of KNP. As such, this item is assessed as having local contributory significance against this criterion.
e	Given that this item is more a place remembered as an orchard than an example of a former orchard, it is unlikely to present significant research potential. It is assessed as not having significance against this criterion.
f	Given that this item is more a place remembered as an orchard than an example of a former orchard, it is not a rare site type. It is assessed as not having significance against this criterion.
g	The site of the orchard is not clearly evidenced and is difficult to interpret/read as a landscape feature. As such, it is not a good example of its type and is assessed as having local contributory significance only against this criterion.
Statement of Significance	This item is thought to be the site of Elizabeth Frazer's (nee Thomas) orchard. While it does not have any clear importance in the history of Lobs Hole, it does potentially have importance in association with the Thomas/Frazer family, the Thomas' being a notable family in the broader history of the valley. It also contributes to the social values of Lobs Hole. The item does not however, display notable aesthetic characteristics nor is it predicted to have research potential. It is not a rare site type, nor representative of its type. This item has potential local significance against criterion b and contributory local significance against criteria d.
SMA items	R36, R37, R38, R44, R52, R54, R77, R79, R83, R102, R119
Criterion	Assessment
a	The items are all associated with the activities of the SMA during the construction of Talbingo Reservoir, a significant component of the Snowy Scheme that is important in the course or pattern of NSW's cultural history. While none of the identified items are especially important in the context of the history of the Snowy Mountains Scheme, they have contributory local significance against this criterion.
b	While the items are all associated to some extent with the work undertaken by people employed by SMA, there are no known, or identifiable special associations between these items and the SMA workers. These items have local contributory significance against this criterion.
c	The items do not generally demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area). However, they are part of a broader scheme that is renowned for its technological achievements. As such, these items have local contributory significance against this criterion.

d	The items do not have any known strong or special association with a particular community or cultural group.
e	The SMA items identified at Lobs Hole comprise either items of infrastructure that are currently in use or remnant pieces of infrastructure and building materials. None are associated with identified potential archaeological deposits, nor do any of the identified SMA items at Lobs Hole display other research potential. These items are assessed as not having significance against this criterion.
f	Items such as these are common features across the Snowy Mountains and NSW as a whole. These items are assessed as not having significance against this criterion.
g	This group of items collectively represent a range of activities associated with the construction of Talbingo Reservoir. They have local contributory significance at a minimum against this criterion within the context of the broader SMA landscape.
Statement of Significance	These items were constructed/used by the SMA during the construction of Talbingo Reservoir, a significant component of the Snowy Scheme. Several of these items are in use. While most of them are not significant features of themselves, they nevertheless form part of a broader landscape of features relating to the SMA and have contributory significance in that context. This group of items has local contributory significance against criteria a, b, c and g.
Possible Structures	R6, R17, R19, R34, R40, R101, R116, R128, R133 – various earth and stone features that appear likely to be remains of former structures.
Criterion	Assessment
a	This group of features comprises items that are suspected remains of buildings. There is however doubt surrounding the nature of these features, and as such there are no known historical associations. The items have unclear connections with the history of the local area. Further research (archival/archaeological) is required in order to fully assess these features against this criterion. This group of items is assessed as having potential local significance against this criterion.
b	This group of features comprises items that are suspected remains of buildings. There is however doubt surrounding the nature of these features, and as such there are no known historical associations. There are no known strong or special associations with persons of local or state importance. Nevertheless, further research (archival/archaeological) is required in order to fully assess these features against this criterion. This group of items is assessed as having potential local significance against this criterion.
c	While none of these features display notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of a broader landscape at Lobs Hole that is renowned for the interplay between cultural and natural features. These items are assessed as having local contributory significance against this criterion.
d	This group of features comprises items that are suspected remains of buildings. There is however doubt surrounding the nature of these features, and as such there are no known strong or special associations with a particular community or cultural group. These items are assessed as not having significance against this criterion.
e	This group of features comprises items that are suspected remains of buildings. Investigations at similar features during the Early Works have demonstrated archaeological research potential with regard to informing extent and nature of dwellings, identification of activity areas, diet

	age/duration of occupation, and/or social status of the occupants. While depth and integrity of potential deposits varies across the identified features, as a group they are predicted to have a high potential to yield information that will at a minimum assist in identifying the period of occupation, function of the structure, and themes associated with the item. This group of items is assessed as having local significance against this criterion.
f	Building platforms, hearths and other remains of former structures are common features across the Snowy Mountains and NSW as a whole. Nevertheless, such features within Ravine have been impacted by the Early Works for Snowy 2.0, and the current proposal would result in a significant increase to the cumulative impacts across such sites at Ravine. As such, these items are becoming increasingly rare at Ravine and may be lost to future generations. The features identified within this group are assessed as having local significance against this criterion.
g	Given that this group comprises items that are suspected remains of buildings, as opposed to items that are definitively identified as structural remains, they cannot be classed as good examples of their type. These items are assessed as not having significance against this criterion.
Statement of Significance	These items have no known, or identifiable important historical or social associations. However, it is noted that additional research/investigation is necessary to fully assess the group's historical and social associations. The group forms part of a broader landscape that is renowned for its natural beauty and the interplay between that and the various cultural features present across the valley. The items identified within this group are predicted to have good potential to yield information that will at a minimum assist in identifying the period of occupation, function of the structure, and associated themes. Furthermore, the group comprises features that are becoming increasingly rare and/or endangered at Lobs Hole. This group of items is assessed to have potential local significance against criteria a and b, local contributory significance against criteria c, and local significance against criteria e and f.
Miscellaneous items	R7, R8, R16, R33, R58, R78, R82, R87, R88, R98, R130, R131 – depressions/pits, moveable heritage (e.g. machinery/car parts), pine tree and modified tree
Criterion	Assessment
a	These items primarily comprise elements of the landscape for which historical associations are unclear. There is nothing to suggest that any of these items are important in the course or pattern of NSW's cultural or natural history. These items are assessed as not having significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or group of persons of local or state importance. These items are assessed as not having significance against this criterion.
c	With the exception of the pine tree at R78, none of these items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The pine tree at R78 was a landmark element at Lobs Hole that was visible from multiple locations – however this item was removed during the Early Works program. As such, none of these items are assessed as having significance against this criterion.
d	The items have no known strong or special associations with a particular community or cultural group. These items are assessed as not having significance against this criterion.

e	The items do not generally demonstrate potential to yield information that will contribute to an understanding of the history of Lobs Hole. Although, it is noted that the depressions/pits at R7, R8, R98 and R131 may have archaeological potential (R33 was investigated during early works and found to be a disturbed natural feature that had also been used to dispose of some twentieth century items – it was determined to not have research potential). Further investigation in the form of test salvage would be necessary in order to fully evaluate these features against this criterion. As a whole, these items are assessed as not having heritage significance against this criterion.
f	Items such as these are common features across the Snowy Mountains and NSW as a whole. These items are assessed as not having significance against this criterion.
g	The items are generally difficult to interpret and as such are not representatives of a class of NSW's cultural or natural places or cultural or natural environments. These items are assessed as not having significance against this criterion.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/unclear research potential. As such, the items do not meet any of the heritage criteria.
Ravine Cemetery	R118 – Ravine Town Cemetery
Criterion	Assessment
a	The Ravine Cemetery is directly associated with themes surrounding “marking the phases of life”. It is important as the official gazetted area for interment of the dead at Ravine. This item is assessed as having local significance against this criterion as a place associated with practices surrounding interment and commemoration of the deceased at Lobs Hole.
b	Historical records indicate that following individuals were buried at the Ravine Cemetery: Violet Dunn, John Gilbert, Michael O'Malley, George Paterick, Aheir Simons and Clarence Thomas. Of these, the Thomas and Paterick families both figure in terms of the known history of Ravine/Lobs Hole, and further research may reveal more about the role of the Dunns, Gilberts, O'Malleys and Simons'. As a whole the cemetery is a place intimately linked with the populace of Ravine. This item is assessed as having local significance against this criterion.
c	While the Ravine Cemetery is no longer clearly discernible as such, and the location blends in with the broader natural landscape, it forms part of the Lobs Hole valley, which is recognised for its landscape qualities. This item is assessed as having contributory local significance against this criterion.
d	The Ravine Cemetery forms part of the broader Lobs Hole valley, which has ongoing special associations with at least two communities/groups: descendants of the town inhabitants (e.g. the Thomas family) and recreational users of KNP. Connections to the first group are more typically evidenced through local histories and newspaper articles. Whereas the importance and connections to recreational users tends to be evidenced more through blog pages and/or social media posts. Overall, there is sufficient evidence to suggest that the broader locality of Lobs Hole has special/strong associations with known communities/groups because of both its natural qualities and the presence of tangible evidence

	of its history. The Ravine Cemetery is assessed as having, at a minimum, local contributory significance against this criterion and the potential for local significance in its own right.
e	The exact locations of the graves within the cemetery is currently unknown, and it is unclear what evidence may remain of the graves. Nevertheless, potential exists for identifying the graves through further investigation (e.g. remote sensing/excavation). Such investigations would yield information about the layout of the cemetery and the nature of the interments. This would further inform themes surrounding the ways in which burials were dealt with in this remote mining and pastoral settlement. This item is assessed as having local significance against this criterion.
f	Rural cemeteries from the turn of the century are not rare within NSW. However, such sites are rare within KNP. The only known comparable site is the cemetery at Kiandra. As such, this item is assessed as having local significance against this criterion.
g	The extent of the Ravine Cemetery and the locations of individual graves are not clearly discernible. The site is difficult to interpret/read as a landscape feature. As such, it is not a good example of its type and is assessed as having local contributory significance only against this criterion.
Statement of Significance	The Ravine Cemetery is an integral component in the development of the cultural landscape of Lobs Hole. It is directly associated with practices surrounding interment and commemoration of the deceased, and has strong connections with the Paterick and Thomas families, who figure more generally in the history of the valley. It also contributes to the broader aesthetics of the landscape and is a place that has ongoing importance for both descendants of Ravine inhabitants and recreational users of KNP. The cemetery is predicted to have local research potential with regard to cemetery layout and specific details relating to burial practices. Ravine Cemetery is also a relatively rare site type within the Snowy Mountains. The site is assessed as having local significance against criteria a, b, d, e and f; and local contributory significance against criteria c and g.
Recreation items	R55, R70, R89
Criterion	Assessment
a	These items are common elements of twentieth century camping activities. There is nothing to suggest that either of these items are important in the course or pattern of NSW's cultural or natural history. These items are assessed as not having significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or group of persons of local or state importance. These items are assessed as not having significance against this criterion.
c	Neither of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. These items are assessed as not having significance against this criterion.
d	The items have no known strong or special associations with a particular community or cultural group. These items are assessed as not having significance against this criterion.
e	The items relate to twentieth century camping activities. They do not have potential to yield information that will contribute to an understanding of NSW's cultural or cultural history (or the local areas). These items are assessed as not having significance against this criterion.

f	Remains of twentieth century campsites are common features across the Snowy Mountains and NSW as a whole. These items are assessed as not having significance against this criterion.
g	The items are not representatives of a class of NSW's cultural or natural places or cultural or natural environments. These items are assessed as not having significance against this criterion.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Lobs Hole Ravine in accordance with the themes they represent.

Table 66 Overview of significance rankings for items at Lobs Hole Ravine

Ravine Township	General Ranking	Archaeological Ranking	Comments
R20	Exceptional	Exceptional/High	R20 encompasses the remains of the Washington Hotel. The remains of the pisé walls are still standing and are a known landmark in the area. The subsurface deposit appears to be intact likely protected within the confines of the pisé walls. R20 is a rare and representative site type, there are no other known buildings of its type in the Snowy Mountains. There are known historical associations evidenced in the literature (Julius Forsstrom). This item is assessed as having exceptional contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R21	Little/Moderate	Moderate/High	R21 was originally recorded as a depression with associated brick and metal as well as structural remains. Excavation revealed this area to be a likely blacksmiths or similar outbuilding associated with the Washington Hotel, evidenced by building foundations and associated artefacts. This item is assessed as having moderate contributory significance (particularly archaeological) to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R22	Negligible	Little	R22 comprises two building platforms evidenced as changes in vegetation. Further investigation

			indicated that this site has low archaeological research potential. This item is assessed as having little contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R23	Moderate	Negligible	R23 is interpreted as a quarry used for material for R20 (Washington Hotel). There are not likely to be any historical artefacts or features in a subsurface deposit therefore the archaeological potential at this site is negligible. Nevertheless, this item forms a highly visible component of the landscape. This item is assessed as having moderate contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R24	Negligible	Little	R24 was identified as two rectilinear depressions on a mid-slope. It was previously suggested that subsurface potential was moderate. During early works this was excavated and revealed a post hole. This is likely to be the remains of a fence line. This item is assessed as having little contributory significance (to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R25	Moderate/High	High	R25 was excavated during the Snowy Hydro 2.0 Early Works project. It's function was unknown but given it's close proximity to the police station it was considered to be associated with it. Excavations of these remains suggested that R25 is the site of the stables for the police station. Building foundations were mostly intact and remains of a floor surface were visible. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R26	Moderate	Moderate	R26 comprises a mound of stone and earth which was interpreted as being a fireplace during excavations for the Early Works phase of the project. Some of the deposit to the

			south of this feature was compromised by rabbit burrows, but remains of post holes and other architectural indicators were identified. This item is assessed as having moderate contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R27	Moderate	Moderate	R27 is a depression or pit with rocks around the perimeter. The function of this item was unclear but it may have been a privy or well. Excavations during the Early Works identified that this feature is likely to have been a toilet pit (privy) that was disturbed by modern camping activities. This item is assessed as having moderate contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R28	Moderate	High	R28 is a pisé structure believed to be the stables associated with R20 (Washington Hotel). Although there was some disturbance from rabbit burrows, the structure of the walls was intact. The structure of the walls contributes to our understanding of the construction of pisé walls in this area and elsewhere. Additionally, the surrounding deposit and associated structures inform our knowledge of the associated yards and outbuildings at the Washington Hotel. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R29	Little	Moderate	R29 comprises a stone and brick mound. It is unclear what its function is or how it contributed to the town. Further investigation is needed to determine its significance. This item is assessed as having moderate contributory significance (particularly archaeological) to the broader setting of Ravine Township and the Lobs Hole Valley as a whole.

R30	Negligible	Negligible	R30 is a rectilinear earth feature with some stones. There are no indications that this feature has any subsurface potential. This item is assessed as having negligible contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R39	Negligible	Moderate	R39 is a square depression with an associated glass artefact scatter. This site was excavated during the Early Works project and revealed to be a rubbish pit. This item is assessed as having moderate contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R59	Negligible	Little	R59 is a glass artefact scatter without any association to a structure. This item is assessed as having little contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R60	Moderate	Moderate/High	R60 is the Ravine police station and thus contributes to our understanding of law and order in the Ravine Township. It's foundations are intact and postholes were revealed through excavation. Its layout and location and proximity to other features within the Ravine Township increase our knowledge of the functionality and cohesiveness of the community. This item is assessed as having moderate/high contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R61	Moderate	Moderate	R61 is interpreted as the police station privy. Excavation of this feature indicated that the item had partially intact deposits that were compromised by modern camping activities. This item is assessed as having moderate contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R121	Negligible	Little	R121 is an amorphous depression located to the northwest of R26 (the

			store). This feature was excavated during the early works and revealed to be a burnt out tree used as a rubbish disposal area. This item is assessed as having little contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
R122	Little	Little-Moderate	R122 comprises a slightly raised stone and earth platform with some associated brick. The results of excavations during the Early Works suggest that this may have been the platform for an ephemeral dwelling. This item is assessed as having little to moderate contributory significance to the broader setting of the Ravine Township and the Lobs Hole Valley as a whole.
Greater Ravine Township	General Ranking	Archaeological Ranking	Comments
R31	Moderate	Little	R31 is a road/track running along the eastern side of an ephemeral drainage line to the southwest of the Ravine Township. Roads and tracks have little archaeological potential as there are not likely to be any associated features or subsurface deposit. However, they do contribute information to the transport in and out of Lobs Hole and around the Ravine Township. This item is assessed as having little to moderate contributory significance to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R41	Little - Moderate	Little - Moderate	R41 consists of two parallel stone alignments. They are located at the end of R64 (water race) and may be associated with this. The function of this feature is unknown and requires further investigation. This item is assessed as having little to moderate contributory significance to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R42	Moderate	Moderate/High	R42 comprises the lot belonging to Rosie Cook. Visible features include evidence of a garden and earthen mounds and depressions. It is

			probable that some building remains will be discernible through archaeological investigation. Further work including archival recording and excavation are required. This item is assessed as having moderate to high contributory significance (particularly archaeological) to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R47	Moderate	Moderate - High	R47 is the site of the old school to the southeast of the main Ravine Township. There were no visible surface indicators of the structural remains, but various artefacts were present across the site. Excavation at this item during Early Works revealed the footings of the building and various artefacts relating to architectural elements and activities conducted at the school. This item is assessed as having moderate to high contributory significance (particularly archaeological) to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R63	Negligible	Moderate	R63 is a pile of broken shale located on Rosie Cook's lot. At the time of recording this area was overgrown with vegetation and features were not discernible. Further investigations are required in order to determine its archaeological potential. This item is assessed as having moderate contributory significance (particularly archaeological) to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R64	Moderate	Little	R64 is a stone lined water race at Rosie Cook's place. Its function is unclear, given its proximity to the township it may have been used for irrigation or to supply the town. The archaeological potential of the site is low, but the site is clearly visible as a landscape feature. This item is assessed as having moderate contributory significance to the broader setting of the Greater

			Ravine Township and the Lobs Hole Valley as a whole.
R66	Moderate	Moderate - High	R66 is an excavated building platform with a stone hearth at the east end. At present little is known of the site. However, given the likelihood that it is a building the archaeological potential is predicted to be moderate to high. This item is assessed as having moderate to high contributory significance (particularly archaeological) to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R71	Moderate	High	R71 consists of two building platforms cut into the hillside and a stone/brick structure, likely to be a reverberatory furnace. This site was originally thought to be a butcher shop, however excavation of the site during Early Works revealed the remains of a residential dwelling and an industrial structure. This site was very well preserved and yielded a high level of information in terms of both material culture and architectural features. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
R113	Moderate	Moderate - High	R113 is a series of building platforms southeast of R71. These platforms were originally thought to be the remains of Yan's sheds, however excavation revealed them to be the remains of earlier cottages. This item is assessed as having moderate to high contributory significance (particularly archaeological) to the broader setting of the Greater Ravine Township and the Lobs Hole Valley as a whole.
Struggle St	General Ranking	Archaeological Ranking	Comments
R48	Moderate	High	R48 is a substantial building cutting/platform with numerous pieces of building material present across the surface. Archaeological potential across the platform is

			predicted to be high. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.
R49	High-Exceptional	Exceptional	R49 comprises the relatively well preserved remains of a horse whim, including stone walls, circular platform and associated machinery. The item is locally rare and a good example of its type. Archaeological potential in and around the feature is predicted to be high. Survey and excavation at this site is likely to contribute directly to an understanding of the age and function of the whim, which would also contribute more broadly to an understanding of the history of both Struggle Street and Ravine. This item is ranked as having high to exceptional contributory significance within the context of both Struggle Street and Ravine.
R50	Moderate	High	R50 comprises a large building platform with surface artefacts including wire rope. This item is predicted to have high potential for relatively intact archaeological deposits that are assessed as being likely to yield information that will help address research questions relating to the nature, form and period of occupation at Struggle Street. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.
R56	Little	Little-Moderate	R56 is a linear feature of rock and earth of unknown function that may be associated with feature R120 (building platform). This feature is difficult to interpret and has unclear historical associations. The archaeological potential in this

			location is unclear. This item is assessed as having little to moderate contributory significance to the broader setting of Struggle Street and Ravine.
R57	High	Moderate-High	R57 comprises a cut and benched road that extends southwest to northeast through the area known as Struggle Street. The road cutting is clearly visible and appears quite well preserved. It is an important component of the layout of Struggle Street and is predicted to have research potential with regard to both the extant surface components and potential for subsurface features/artefacts. This item is assessed as having moderate to high contributory significance to the broader setting of Struggle Street and Ravine.
R76	Little	Little-Moderate	R76 is a surface scatter of domestic debris associated with the remains of the Struggle Street mining settlement. While the archaeological potential associated with this feature is unclear, it forms part of a complex that has strong and important historical associations. This item is assessed as having little to moderate contributory significance to the broader setting of Struggle Street and Ravine.
R104	Little	Little-Moderate	R104 is a curved linear earth and stone feature that leads into a tributary of the headwaters of Lick Hole Gully at Struggle Street. This feature is difficult to interpret and has unclear historical associations. The archaeological potential in this location is unclear. This item is assessed as having little to moderate contributory significance to the broader setting of Struggle Street and Ravine.
R105	Little	Little-Moderate	R105 is a linear ditch at Struggle Street, possibly associated with item R104. This feature is difficult to interpret and has unclear historical associations. The archaeological potential in this location is unclear. This item is assessed as having little to moderate contributory

			significance to the broader setting of Struggle Street and Ravine.
R106	Moderate	Moderate	R106 appears to be a portion of a former road/path through the area known as Struggle Street (possibly associated with R108). This feature is not as well preserved or easily interpreted as R57. Nevertheless, further investigation of this feature may contribute to an understanding of the layout of Struggle Street; it is predicted to have moderate research potential with regard to both the extant surface components and potential for subsurface features/artefacts. This item is assessed as having moderate contributory significance to the broader setting of Struggle Street and Ravine.
R107	Moderate	High	R107 is a large building platform with pieces of building material present across the surface. The item corresponds to the location of buildings shown on the 1911 map of Ravine. Archaeological potential across the platform is predicted to be high. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.
R108	Moderate	Moderate	R108 appears to be a portion of a former road/path that extends eastwards from Lick Hole Gully through the area known as Struggle Street (possibly associated with R106). This feature is deeply incised and strongly visible in the landscape. Further investigation of this feature may contribute to an understanding of the layout of Struggle Street; it is predicted to have moderate research potential with regard to both the extant surface components and potential for subsurface features/artefacts.

			This item is assessed as having moderate contributory significance to the broader setting of Struggle Street and Ravine.
R109	Moderate	High	R109 is a particularly large cutting for a house platform. There are numerous examples of introduced plant species in and around the site. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.
R110	Moderate	High	R110 is a sizeable cutting for a house platform that is heavily overgrown with blackberry and has various pieces of building materials (particularly tin) across the site. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.
R111	High	Moderate-High	R111 comprises the remains of the road/path known as Struggle Street, which runs along the eastern side of Lick Hole Gully. The road cutting is clearly visible and appears relatively well preserved. It is a key component of the layout of Struggle Street and is predicted to have research potential with regard to both the extant surface components and potential for subsurface features/artefacts. This item is assessed as having moderate to high contributory significance to the broader setting of Struggle Street and Ravine.
R115	Moderate	Moderate	R115 is a stoned lined channel in Lick Hole Gully. The feature is relatively well preserved, but its

			function is unclear. It is likely that additional survey and/or excavation would inform the purpose and broader context of this feature. This item is assessed as having moderate contributory significance to the broader setting of Struggle Street and Ravine.
R120	Moderate-High	High	R120 is a relatively small building platform that is partially delineated by a line of cobbles along the northern side. While the surface remains of this feature appear quite ephemeral, it is likely that areas of relatively intact archaeological deposit remain that would illuminate the nature and extent of the former building. Of particular relevance is the fact that this item represents one of the smaller buildings identified at Struggle Street, which may provide an important comparison with the more substantial building sites identified at R48, R50, R107, R109 and R110. The feature is part of a complex with strong historical associations and a recognised potential to address research questions relating to the theme of mining settlements. This item is assessed as having high contributory significance (particularly archaeological) to the broader setting of Struggle Street and the Lobs Hole Valley as a whole.
Pastoralism	General Ranking	Archaeological Ranking	Comments
R1	Moderate - High	Moderate - High	R1 is the location of the West Pinbeyan Station Homestead. It later became the mine managers residence, the Yan's house and the post office. Whilst there is little evidence of the building foundations, archaeological excavation has potential to reveal more of the layout and nature of the structures that once stood here. There is some disturbance at this site. This item is assessed as having moderate to high contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.

R3	Little	Moderate	R3 is a possible building structure with an earth platform and associated stone and brick. The archaeological potential of this site can't be accurately ascertained without excavation. This item is assessed as having moderate contributory significance (particularly archaeological) to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R4	Moderate	Moderate	R4 is a square depression to the northeast of R1 and maybe an outbuilding or privy. There are no associated artefacts. Archaeological excavation is required to ascertain its function and how it relates to other features in the Lobs Hole Valley. This item is assessed as having moderate contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R15	Little	Little	R15 is a linear stone feature associated with fence remains. It is likely that these remains form a fence or the remains of a water race. There is very little archaeological potential at this site. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R18	Little	Negligible	R18 is a portion of rabbit proof fence. This type of fencing is found across the Lobs Hole Valley and it not specific to this settlement. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R35	Little	Negligible	R35 is the remains of a fence consisting of rocks and chicken wire. There is not likely to be any subsurface cultural deposit associated with this feature. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R43	Little	Negligible	R43 is a portion of rabbit proof fence. This type of fencing is found across the Lobs Hole Valley and it not specific to this settlement. This

			item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R65	High	High	R65 are the remains of John Thomas' Sheep Hill Station Homestead. It is not known how much remains of this homestead but it is likely to have high archaeological potential. Historical records indicate that this was a large wooden house with a bullock track leading up the hill towards it. They also indicate that there was an orchard at this site. In the side of the hill he cut a small storage space for butter and eggs. This item is assessed as having high contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R73	Little	Negligible	R73 is a portion of rabbit proof fence. This type of fencing is found across the Lobs Hole Valley and it not specific to this settlement. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R92	Little - Moderate	Moderate	R92 consists of two levelled earth platforms measuring 20 x 4 m. It is possible that these are building platforms and therefore may contain subsurface archaeological deposits in association. This item is assessed as having moderate contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R93	Little	Negligible	R93 is the remains of a fence consisting of rocks and chicken wire. There is not likely to be any subsurface cultural deposit associated with this feature. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R97	Little	Negligible	R97 consists of a collection of exotic trees. This site type doesn't have any archaeological potential, however the type of trees and whether they form part of a garden or line a road are pieces of

			information that are useful and contribute to a greater understanding of life in Ravine. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R100	Negligible	Negligible	R100 is a single tine plough from the 1890s. Whilst it is useful to note its presence, being a moveable item of heritage and no associated features its archaeological potential is very limited. This item is assessed as having negligible contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R103	Little - Moderate	Moderate	R103 consists of a levelled earth platform measuring 20 x 2 m. It is possible that these are building platforms and therefore may contain subsurface archaeological deposits in association. This item is assessed as having moderate contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
R129	Little	Negligible	R129 is a remnant fence line on a gentle slope. Whilst archaeologically the potential is very low, it is useful to know the alignment of fence lines. This is informative in terms of property allotments and the Lobs Hole Valley settlements more broadly. This item is assessed as having little contributory significance to the broader setting of pastoralism and the Lobs Hole Valley as a whole.
Mining	General Ranking	Archaeological Ranking	Comments
R2	Little - Moderate	Negligible	This section of metal water pipe has various stages of history associated with it including its use at the Lobbs Hole Copper Mine and its repurpose at the Yan's house. As a result this item is imbued with more meaning than most of its type, however its significance is not attached to its location and there is no archaeological potential. The item can be moved. This item is assessed as having little to moderate contributory significance to the

			broader setting of mining and the Lobs Hole Valley as a whole.
R5	Little - Moderate	Negligible	R5 is a deposit of slag from the smelter site. There are other deposits of its type and this particular deposit doesn't have any archaeological potential. Its extent should be mapped and samples taken. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R9	Little - Moderate	Negligible	R9 comprises two vertical mine shafts from the Lobbs Hole Copper Mine. There is no archaeological potential beyond archival recording. The location of these mine shafts should be recorded. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R10	Moderate	Negligible	R10 comprises a mine shaft, mullock heap and cage. The location of the shaft and cage should be noted and the extent of the mullock heap should be mapped. There is no archaeological potential beyond archival recording. This item is assessed as having moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R11	Negligible	Negligible	R11 is a mullock heap on the south side of the Yarrangobilly River. There is no archaeological potential beyond archival recording. This item is assessed as having negligible contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R12	Moderate	Little - Moderate	R12 are the concrete foundations for the Pelton water wheel in the river bed. Whilst the potential for subsurface deposit within the river is negligible there may be potential on the river banks. There may be some archaeological potential, further investigation is needed. This item is assessed as having moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.

R13	Little - Moderate	Little	R13 is a cutting in bedrock thought to be associated with the overhead tramway between Shaft 1 and R14. There is not likely to be any subsurface potential, however the area should be investigated to ensure that this interpretation is accurate. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R14	Moderate	Moderate - High	R14 is the site of a reverberatory furnace. This site has potential to contribute to our understanding of industrial construction and copper ore processing in the early 20 th century. There is likely to be archaeological potential particularly within the subsurface deposits at this site. This item is assessed as having moderate - high contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R45	Moderate	Little	R45 is a water race at the base of a hill slope on the southern side of the Yarrangobilly River. Water races are not unique to this landscape and the archaeological potential is low. However, it is significant in a mining landscape setting and should be recorded. This item is assessed as having moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R46	Negligible	Negligible	R46 is an excavation to the west of the Lobs Hole Ravine Road. The area is heavily vegetated and no archaeological material was seen. The presence of a spoil or mullock heap suggests that it may be a modern feature. This item is assessed as having negligible contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R51	Moderate	Little	R51 is the site of a mine adit and associated wooden hoist for transporting copper ore. There is very little archaeological potential beyond archival recording. This item is assessed as having moderate

			contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R62	Little - Moderate	Little	R62 is a possible mine shaft on the east side of the Yarrangobilly River. This item was located via aerial images as it was too heavily vegetated to locate. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R67	Moderate	Moderate	R67 is known as Lobbs Hole Central Mine which encompasses mining infrastructure on the north east side of the river not recorded for this project. This item is assessed as having moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R68	Little - Moderate	Little	R68 is a mine shaft located within the Lobbs Hole Central Mine infrastructure that wasn't recorded for this project. As such archival recording is required before any impacts. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R69	Moderate	Moderate - High	R69 is a beehive brick kiln used to make bricks for the reverberatory furnace (R14). The site includes an excavated rectilinear pit, access road, platform, cut and kiln remains. Archaeological potential is predicted to be moderate to high. This item is assessed as having moderate to high contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R72	Moderate	Little - Moderate	R72 is a semicircular stone furnace built against bedrock. Its function is unknown but there is evidence of use with the stones showing blackening and a 'baked' appearance. Given that it is built against bedrock there is little subsurface potential, however further investigation is needed to ascertain its former use. This item is assessed as having moderate

			contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R74	Little - Moderate	Negligible	R74 is another section of metal water pipe. It is located at the northern end of a water race, but it is unknown if this was its original location. Other sections of water pipe are found throughout Lobs Hole.. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R75	Little - Moderate	Negligible	R75 is a mine shaft recorded in the historical literature. Archaeologists were unable to locate the mine shaft during the survey. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R81	Moderate	Negligible	R81 is the remains of a water race on the east side of the Yarrangobilly River. It is thought that it may be a part of R45. Archival recording is needed before any impacts. This item is assessed as having moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R90	Moderate	Little	R90 is an adit in a creek bed known as the Lick Hole Gully Adit. Rotten wood props and metal rail tracks are located near the entrance suggesting that the ore was taken from here via rail. This item is assessed as having moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R91	Little - Moderate	Negligible	R91 is a mine shaft on the west side of Lick Hole Gully. It has been filled in and there is a tree growing in it. This item is assessed as having Little - Moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R96	Moderate	Negligible	R96 is the site of a former open cut mine and subsequent brick manufacturing. There are few visible features of the mine visible. This item is assessed as having

			moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R99	Little	Negligible	R99 is a rectilinear excavation with an unknown depth. It is likely that this is a mine shaft and as such has very little archaeological potential. This item is assessed as having little contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R112	Little - Moderate	Negligible	R112 is a mine shaft located on the eastern side of the Yarrangobilly River. This site was not investigated as the vegetation was too thick. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R114	Little - Moderate	Little - Moderate	R114 is an excavated pit and associated railway tracks. It is not clear what the function of this feature is because the area is too heavily vegetated. Clearing and further investigation is necessary to ascertain its significance. This item is assessed as having little to moderate contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
R117	Negligible	Negligible	R117 is a test shaft located on historical mining plans. Attempts to locate this feature were unsuccessful. This item is assessed as having negligible contributory significance to the broader setting of mining and the Lobs Hole Valley as a whole.
Transport	General Ranking	Archaeological Ranking	Comments
R53	Little - Moderate	Negligible	R53 is the remnants of an old road. Whilst this site has negligible archaeological potential, its location and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R84	Little - Moderate	Negligible	R84 is the remnants of an old road. Whilst this site has negligible archaeological potential, its location

			and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R85	Little - Moderate	Negligible	R85 is the remnants of an old road. Whilst this site has negligible archaeological potential, its location and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R86	Little - Moderate	Negligible	R86 is the remnants of an old road. Whilst this site has negligible archaeological potential, its location and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R94	Little - Moderate	Negligible	R94 is the remnants of an old road. Whilst this site has negligible archaeological potential, its location and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R95	Little - Moderate	Negligible	R95 is the remnants of an old road. Whilst this site has negligible archaeological potential, its location and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R132	Little - Moderate	Negligible	R132 is the remnants of an old track with associated corrugated iron

			culvert remains. Whilst this site has negligible archaeological potential, its location and alignment are informative in terms of the movement of people and goods in and out of the Lobs Hole Valley. This item is assessed as having little to moderate contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
Agriculture	General Ranking	Archaeological Ranking	Comments
R80	Moderate	Moderate	R80 is the location of Elizabeth Frazer's (nee Thomas) orchard. The vegetation at the site was too thick to record the site sufficiently therefore further investigation after clearing is needed. It is likely that there are building remains associated with this feature. Investigating house sites is necessary to gain an understanding of how people lived and functioned in this remote valley. This item is assessed as having moderate contributory significance to the broader setting of agriculture and the Lobs Hole Valley as a whole.
SMA	General Ranking	Archaeological Ranking	Comments
R36	Negligible	Negligible	R36 is a small excavation that may be associated with a Snowy Mountains Authority (SMA) flying fox. There is negligible subsurface potential, although the feature should be recorded. This item is assessed as having negligible contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R37	Little to Moderate	Little	R37 is a southern anchor point and shed for a flying fox over the Yarrangobilly River. There is likely to be very little archaeological potential, but the site should have archival recording. This item is assessed as having little to moderate contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R38	Little to Moderate	Little	R38 is a stream gauging station and associated flood level markings. There is likely to be very little

			archaeological potential, but the site should have archival recording. This item is assessed as having little to moderate contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R44	Little to Moderate	Little	R44 has been named by the Kosciuszko Huts Association (KHA) as the Stable Creek Stream Gauging Station. It is located on Wallaces Creek and is not currently operational. There is likely to be very little archaeological potential, but the site should have archival recording. This item is assessed as having little to moderate contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R52	Little	Negligible	R52 is a survey marker consisting of a galvanised iron rod installed in the ground. It is no longer installed and is lying on its side. This item is assessed as having little contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R54	Little to Moderate	Negligible	R54 are the remains of a bridge on Mine Trail over Wallaces Creek. The site should be archivally recorded. This item is assessed as having little to moderate contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R77	Negligible	Negligible	R77 is the location of a meterological station. Unfortunately this site was unable to be locate during the survey. This item is assessed as having negligible contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R79	Little	Negligible	R79 are the concrete bridge foundations at Wilsons Crossing near the Washington Hotel (R20). Photo's from the 1960s show this bridge in disrepair, but they show that its structure was wooden. Archival recording is recommended. This item is assessed as having little contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.

R83	Negligible	Negligible	R83 consists of a pile of sheet metal. There are no other artefacts of building remains associated with this feature. It is not clear if these items are in their original location. They should be recorded before relocation. This item is assessed as having negligible contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R102	Little	Negligible	R102 is a stone culvert in Lobs Hole Powerline Road thought to be associated with SMA construction in the 1950s. This item is assessed as having little contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
R119	Moderate	Little	R119 is a weather station that is currently in use. This item is assessed as having moderate contributory significance to the broader setting of SMA and the Lobs Hole Valley as a whole.
Possible structure	General Ranking	Archaeological Ranking	Comments
R6	Moderate	Moderate	R6 comprises stone flagging, a platform and associated artefacts. This site has the potential to contain building features. This site should be further investigated for its archaeological potential before an assessment of its significance can be made. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R17	Moderate	Moderate/High	R17 is a possible building platform to the west of R1 and R3. Given its proximity to other building structures it is likely that this is associated with them. Further archaeological investigation is needed. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R19	Moderate	Moderate	R19 is a levelled pad cut into the hillslope with an associated artefact scatter. Levelled platforms especially in association with

			artefacts cannot be ruled out as possible building structures. This site should be investigated further. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R34	Moderate	Moderate	R34 is a possible stone hearth with a possible building platform. This site should be investigated further so that its function can be determined. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R40	Moderate	Moderate	R40 comprises two rectilinear features that may be building platforms. Further archaeological investigation is necessary to determine the function of these platforms. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R101	Moderate	Moderate	R101 is a possible building structure site evidenced by the presence of introduced plants such as apple trees. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R116	Moderate	Moderate	R116 is the location of the Hetherington's residence and was recorded as a mound of earth and a steel bed frame. Given the presence of furniture and a historical reference it is highly likely that some evidence of this dwelling remains. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R128	Moderate	Moderate - High	R128 is the location of the first school at Lobs Hole. Unfortunately the site was unable to be relocated during the survey. Owing to the significance of this site another attempt should be made to relocate it. It is likely that there will be no evidence of this site without mechanical excavation to examine

			the subsurface deposit. This item is assessed as having moderate to high contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R133	Moderate	Moderate	R133 is a building platform located on a hill slope in Lick Hole Gully. It is not clear what the function of this site was. Further archaeological investigation is necessary. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
Miscellaneous	General Ranking	Archaeological Ranking	Comments
R7	Little	Little	R7 was recorded as a square depression. There are no other artefacts or features in association with it. It's archaeological potential is unknown and further investigation is necessary. This item is assessed as having little contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R8	Little	Little	R8 is a rectilinear depression bordered with cobbles. It's function is unknown and further archaeological investigation is necessary. This item is assessed as having little contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R16	Negligible	Negligible	R16 comprises two piles of rocks, three metal drums and an ore bucket. It is unclear whether this is building site or not. Further archaeological investigation is needed to rule this out. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R33	Moderate	Moderate	R33 is an excavated area with associated bricks. It is unclear what the function of this site is, but it may be a building site further archaeological investigation is needed. This item is assessed as having moderate contributory significance to the broader setting of

			Ravine and the Lobs Hole Valley as a whole.
R58	Negligible	Negligible	R58 comprises two metal pipes sitting on stone cairns. There is no archaeological potential at this site. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R78	Little	Negligible	R78 is a pine tree that has since been removed for Snowy Hydro 2.0. This item is assessed as having little contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R82	Negligible	Negligible	R82 is the front seat of a car (likely 1960s era) located on a water race. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R87	Negligible	Negligible	R87 is a large Eucalyptus with two axe marks. It doesn't appear as though the cuts had any purpose and therefore were either accidental or were not intended to harm or mark the tree. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R88	Moderate	Moderate	R88 is a mound of earth covered in river cobbles. It is relatively close to the Ravine Cemetary, therefore it has to be considered that this may be a burial. Further investigation is necessary and this site shouldn't be impacted until that possibility is ruled out. This item is assessed as having moderate contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R98	Little	Little	R98 is an excavated pit with metal and other artefacts within it. Its function is unknown and should be investigated. This item is assessed as having little contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R130	Negligible	Negligible	R130 is a mechanically excavated borrow pit at the edge of the current vehicle track. There are no

			associated artefacts. This item is assessed as having negligible contributory significance to the broader setting of transport and the Lobs Hole Valley as a whole.
R131	Negligible	Little	R131 is an excavated area located close to the Lobs Hole and Mine Trail intersection. This area needs to be investigated more thoroughly before any impact. This item is assessed as having little contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
Ravine Cemetery	General Ranking	Archaeological Ranking	Comments
R118	High	High - Exceptional	R118 is the location of the Ravine Cemetery. The site is overgrown and there are not currently any grave markers. At least six people are buried here and as the historical records are scanty at best it is possible that there may be more. Whilst it is likely that people were buried in other locations prior to the gazettal of the Ravine cemetery being the only known burial location increases this sites significance. This item is assessed as having high to exceptional contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
Recreation	General Ranking	Archaeological Ranking	Comments
R55	Negligible	Negligible	R55 is a brick hearth at the end of Mine Trail. It is likely that this is a picnic site associated with more recent use of KNP. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R70	Negligible	Negligible	R70 is a concrete fireplace for use as a modern barbeque for visitors to KNP. There are many such sites in the National Park therefore this is not considered significant. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
R89	Negligible	Negligible	R89 is a small semi-circular pile of stone. It is likely that this is a

			modern camp fire used by visitors to KNP. This item is assessed as having negligible contributory significance to the broader setting of Ravine and the Lobs Hole Valley as a whole.
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8.2.2 Marica

The potential heritage items recorded at the Marica survey area largely comprise items relating to pastoralism and elements of the broader Kiandra mining landscape. One SMA survey marker (Marica Trig) was also recorded. A significance assessment of the Marica historical heritage items is presented in the tables below.

Table 67 Overview of significance assessment for Marica.

Pastoral Items	Irwin's Hut Ruin; MSU1/H3, MSU1/H6, MSU4/H1 and MSU8/H1 - The items include remains of fences and a former hut site (location of which is uncertain).
Criterion	Assessment
a	There are no known historical associations for any of these features. While the items relate to twentieth century, and possibly late nineteenth century pastoral activities, they cannot be identified as important pastoral components. Items MSU1/H3, MSU1/H6, MSU4/H1 and MSU8/H1 are all assessed as not having significance against this criterion. The potential Irwin's hut ruin requires additional historical research in order to fully assess it against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. The potential hut ruin requires additional historical research in order to fully assess it against this criterion.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	Most of the items recorded in this group are fence lines, or remnants thereof. While recording of these features would contribute to an overall archive of fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains. However, the potential hut site may contain relatively intact archaeological deposits that would potentially provide information relating to the phasing, duration and nature of twentieth century pastoral occupation. Such information would potentially contribute to an understanding of the later phases of pastoral use prior to the formation of the KNP.
f	The pastoral items within the Marica survey area comprise remnants of common elements of the pastoral landscape. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of

	NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	<p>Most of these items have no known, or identifiable, important historical or social associations. The only potential exception is the former hut site. However, there is insufficient historical information regarding this item to assess whether or not it meets criteria a or b. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Most of the pastoral items in this survey area are not associated with potential archaeological deposits. However, the Irwin's hut site may include areas of potential archaeological deposit. Excavation of this feature might yield information which would contribute to an understanding of late nineteenth century pastoral occupation in the Snowy Mountains, which would contribute more broadly to an understanding of the patterns of settlement and land use in the Australian Alps.</p> <p>In summary, the hut site is assessed as potentially having local significance against criteria a, b and e. All the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.</p>
Mining Items	MSU1/H1, MSU1/H2, MSU1/H4 and MSU1/H5 – All of these items are water races.
Criterion	Assessment
a	This group comprises water races that form part of the broader Kiandra gold fields mining landscape which dates back to the mid nineteenth century and is a significant element in the history of the Snowy Mountains. While none of the identified water races at Marica are known to have been important components of that landscape, further research and analytical mapping would be required in order to fully assess these items. They are, at a minimum, assessed as having local contributory significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. Further research into associated mine records is necessary in order to fully assess these items against this criterion.
c	While these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of a broader mining landscape that has landmark qualities.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	These items form part of a broader landscape that has demonstrated potential to yield information that will contribute to an understanding of nineteenth and early twentieth century mining in the Snowy Mountains. Detailed survey and/or excavation of these features (e.g. trenches across the water races) has the potential to yield information that will contribute to an understanding of the engineering and phasing of mining in the local area.
f	Mining features are common across the Kiandra landscape, the broader KNP landscape and NSW as a whole. This group of items do not have local or state significance against this criterion.
g	While this group of items comprises features typical of water management associated with gold mining, none of these items are notable in terms of their representativeness. Nevertheless, they contribute to the

	broader Kiandra landscape, which is important in demonstrating mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. The Kiandra landscape is also arguably of importance at a state level as an example of diverse complex of alluvial mining dating back to the mid-nineteenth century. As such, these items have contributory significance as part of a landscape that has local, if not state significance against this criterion.
Statement of Significance	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criteria a, c, and g, and local significance against criterion e due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
SMA Items	Marica Trig
Criterion	Assessment
a	This item is a component of the survey activities of the SMA. The Snowy Mountains Scheme continues to be recognised as an important component of the local area's history as well as significant in the development of NSW and the nation. However, the survey marker is not of itself an important component of the Snowy Mountains Scheme, is of contributory significance only against this criterion.
b	This item has no known, or identifiable special associations with the life or works of a person of local or state importance. It is however associated with the works of people employed by SMA, and as such has contributory significance against this criterion.
c	The item is in poor condition and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	This item does not have any known strong or special association with a particular community or cultural group.
e	The survey marker is in poor condition and is not associated with any identifiable archaeological deposits. It is assessed as not having significance against this criterion.
f	SMA survey markers are relatively common features in the KNP, and similar items are common across NSW. This item is assessed as not having significance against this criterion.
g	The item is in poor condition and is not a good example of its type. It is assessed as not having significance against this criterion.
Statement of Significance	The survey marker is in poor condition and has no known strong or special historical or social associations of itself. The item has contributory significance against criteria a and b as part of the broader landscape of the SMA, and specifically as part of the evidence of activities associated with surveying the Snowy Mountains.

The following table presents a significance ranking of each potential historic item at Marica in accordance with the themes they represent.

Table 68 Overview of significance rankings for heritage items at Marica.

Pastoral items	General Ranking	Archaeological Ranking	Comments
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Irwin' Hut Ruin	Moderate	Moderate-High?	The Irwin's Hut Ruin was not relocated during the survey. There is no known information about this item (other than it was a horse shed) and its location is uncertain. This site is predicted to have associated archaeological deposits. As such, the item is likely to have contributory significance within the context of the broader pastoral landscape.
MSU1/H3	Little	n/a	MSU1/H3 is an isolated wooden fence post with barbed wires. There is no other discernible evidence of the fence line that it relates to. Furthermore, there are no predicted associated archaeological deposits in this location. The fence post has little contributory significance within the context of the broader pastoral landscape.
MSU1/H6	Little	n/a	MSU1/H6 comprises remnant fencing materials in association with a mound of rock. There are no predicted associated archaeological deposits in this location. This item is difficult to interpret and in poor condition. This item has little contributory significance within the context of the broader pastoral landscape.
MSU4/H1	Little	n/a	MSU4/H1 is a remnant portion of fencing that comprises three split posts with fire damage and no predicted associated archaeological deposit. The fence is in poor condition and has little contributory significance within the context of the broader pastoral landscape.
MSU8/H1	Little	n/a	MSU8/H1 is a remnant fence line in poor condition with no predicted associated archaeological deposit. The fence has little contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
MSU1/H1	Moderate	Little-Moderate	MSU1/H1 is a water race associated with Kiandra gold mining. The condition of this feature varies from well preserved to damaged and overgrown. The feature has limited archaeological potential. The race has moderate contributory significance within the context of the broader mining landscape.
MSU1/H2	Little-Moderate	Little	MSU1/H2 is a water race associated with Kiandra gold mining. The condition of this feature is quite poor, and it has limited archaeological potential. The race has little to moderate contributory significance

			within the context of the broader mining landscape.
MSU1/H4	Moderate	Little	MSU1/H4 is a water race associated with Kiandra gold mining. The condition of this feature is fair, although it has relatively limited archaeological potential. The race has little to moderate contributory significance within the context of the broader mining landscape.
MSU1/H5	Little-Moderate	Little	MSU1/H5 is a water race associated with Kiandra gold mining. The feature is heavily overgrown and not readily identifiable beyond the short section recorded during survey. The feature has limited archaeological potential. The race has little to moderate contributory significance within the context of the broader mining landscape.
SMA Items	General Ranking	Archaeological Ranking	Comments
Marica Trig	Little	Negligible	Marica Trig is a survey marker that is in a dilapidated condition, and it has no identifiable archaeological deposits in association with it. This item is not assessed as having heritage significance of itself. However, it is assessed as having little contributory significance as part of the broader SMA landscape.

8.2.3 Gooandra Hill

The potential heritage items recorded at the Gooandra Hill survey area largely comprise items relating to transport and elements of the broader Kiandra mining landscape. A DMR hut site and a SMA survey marker (Gooandra Trig) are also present. A significance assessment of the Gooandra Hill historical heritage items is presented in the tables below.

Table 69 Overview of significance assessment for Gooandra Hill.

Pastoral Items	GHSU1/H3 – a possible dugout spring
Criterion	Assessment
a	There are no known historical associations for this feature, and its function/origin is unclear. As such, it cannot be identified as an important pastoral component. The item is assessed as not having significance against this criterion.
b	This item has no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. The item is assessed as not having significance against this criterion.
c	The item does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, it does not display

	any landmark qualities within the broader landscape. The item is assessed as not having significance against this criterion.
d	The item does not have any known strong or special associations with a particular community or cultural group in NSW or the local area. The item is assessed as not having significance against this criterion.
e	The item is of unclear origin/function and does not appear to be associated with any nearby sites/features. Potential for archaeological deposits in and around this feature is minimal. The item is unlikely to have potential to yield important information that will contribute to an understanding of the history of the area. As such, it is assessed as not having significance against this criterion.
f	Small excavated features such as this are common features within KNP and the broader landscape of NSW. The feature is not uncommon or rare.
g	The function/origin of this item is unclear. As such, it cannot be defined as representative of a site type. It is assessed as not having significance against this criterion.
Statement of Significance	The item has no known, or identifiable, important historical or social associations. It does not demonstrate notable aesthetic or technical/creative achievement. It is a common feature within the landscape and present very limited potential for further investigation and research. It does not meet the threshold for local or state listing against any of the heritage criteria.
Mining Items	GHSU1/H2 & GHSU7/H1 – A costean and a water race.
Criterion	Assessment
a	This group comprises a costean and a water race that form part of the broader Kiandra gold fields mining landscape which dates back to the mid nineteenth century and is a significant element in the history of the Snowy Mountains. While the items at Gooandra Hill are not known to have been important components of that landscape, further research and analytical mapping would be required in order to fully assess these items. They are, at a minimum, assessed as having local contributory significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. Further research into associated mine records is necessary in order to fully assess these items against this criterion.
c	While these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of a broader mining landscape that has landmark qualities.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	These items form part of a broader landscape that has demonstrated potential to yield information that will contribute to an understanding of nineteenth and early twentieth century mining in the Snowy Mountains. Detailed survey and/or excavation (e.g. trenches across the water race) has the potential to yield information that will contribute to an understanding of the engineering and phasing of mining in the local area.
f	Mining features are common across the Kiandra landscape, the broader KNP landscape and NSW as a whole. This group of items do not have local or state significance against this criterion.
g	While this group of items comprises features typically associated with gold mining, none of these items are notable in terms of their representativeness. Nevertheless, they contribute to the broader Kiandra

	landscape, which is important in demonstrating mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. The Kiandra landscape is also arguably of importance at a state level as an example of diverse complex of alluvial mining dating back to the mid-nineteenth century. As such, these items have contributory significance as part of a landscape that has local, if not state significance against this criterion.
Statement of Significance	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criteria c, and g, and local significance against criterion e due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
SMA Item	Gooandra Trig (GHSU1/H1)
Criterion	Assessment
a	This item is a component of the survey activities of the SMA. The Snowy Mountains Scheme continues to be recognised as an important component of the local area's history as well as significant in the development of NSW and the nation. However, the survey marker is not of itself an important component of the Snowy Mountains Scheme; it is of contributory significance only against this criterion.
b	This item has no known, or identifiable special associations with the life or works of a person of local or state importance. It is however associated with the works of people employed by SMA, and as such has contributory significance against this criterion.
c	The item is in good condition and forms a highly visible cultural feature in an area that otherwise appears relatively unmodified. While the item does not of itself demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, it contributes to the broader cultural landscape of the KNP, particularly in relation to the theme of SMA and the associated survey works.
d	This item does not have any known strong or special associations with a particular community or cultural group.
e	The survey marker is not associated with any identifiable archaeological deposits. It is assessed as not having significance against this criterion.
f	SMA survey markers are relatively common features in the KNP, and similar items are common across NSW. This item is assessed as not having significance against this criterion.
g	The item is in good condition and is a good example of a mid-twentieth century survey marker constructed from a mixture of local material (stone) and elements manufactured off-site (post and metal vane). It is assessed as having contributory significance against this criterion within the context of the broader set of survey markers that exist across the Snowy Mountains.
Statement of Significance	The survey marker is in good condition and is a good example of its type that stands out as a cultural feature within an area that otherwise appears largely unmodified. While it has no known strong or special historical or social associations of itself, the item has contributory significance against criteria a and b as part of the broader landscape of the SMA, and specifically as part of the evidence of activities associated with surveying the Snowy Mountains. It also has local contributory

	significance against criterion c and g as part of the broader landscape of survey infrastructure for the SMA.
Items relating to transport	DMR Hut (GHSU1/H4)
Criterion	Assessment
a	This item is a component of the development of roads in the Snowy Mountains. The hut provided accommodation for DMR workers during the mid-twentieth century. While the DMR hut site is not of itself an important component of the transport system in the Snowy Mountains, it is a key component of the infrastructure required for road construction and maintenance works through the alpine area during the mid-twentieth century. As such, the item is assessed as having local contributory significance against this criterion.
b	This item has no known, or identifiable special associations with the life or works of a person of local or state importance. It is however associated with the works of people employed by the DMR, and as such has contributory significance against this criterion.
c	The hut site is clearly visible from the highway, with the basalt hearth remains forming a distinct cultural feature in contrast to the surrounding bushland. While the item is not of itself particularly notable in terms of aesthetic characteristics or technical/creative achievement, it does display some landmark qualities that contribute to the broader cultural landscape of Kiandra and the KNP. As such, the item is assessed as having local contributory significance against this criterion.
d	This item does not have any known strong or special association with a particular community or cultural group.
e	The site does have potential to contain relatively intact archaeological deposits, across both the immediate building platform and the broader site area. Excavation of these deposits may provide information relating to the nature of accommodation provided for DMR workers and the ways in which such accommodation was used. While there are likely to be various DMR records relating to worker accommodation, archaeological evidence of the way in which it was used may provide a contrast that illuminates the reality of life in such accommodation. Excavation may also yield information relating to the broader topics of road building and logistical organisation of DMR personal in the Snowy Mountains. Such information would potentially contribute to an understanding of the development of transport in the Snowy Mountains and the history of the DMR. This item is assessed as having local significance against this criterion.
f	DMR accommodation sites are not common in KNP. This item is assessed as having local significance against this criterion.
g	The hearth is in good condition and is a relatively good example of its type. However, further research is necessary into DMR accommodation (and other types of State government worker accommodation) in order to fully assess the site's representativeness. This item is assessed as having local contributory significance, at a minimum, against this criterion.
Statement of Significance	DMR sites such as this are relatively rare in the KNP. The site is in good condition and has landmark qualities that contribute to the broader cultural landscape of Kiandra and the KNP. While the item has no known strong or special historical or social associations of itself, it does form a key component of DMR infrastructure for road construction and maintenance works in the mid-twentieth century. Further investigation of the site (including archival research and archaeological excavation) is

	likely to provide information that will contribute to an understanding of the use of the hut and how that compares with DMR records for the structure. This item is assessed as having local contributory significance against criteria a, b, c, and g as part of the road network in the Snowy Mountains. It is also assessed as having local significance against criteria e and f as a relatively rare and intact archaeological site that has the potential to contribute to an understanding of the development of transport in the Snowy Mountains and the history of the DMR.
Miscellaneous Items	GHSU12/H1 and GHSU13/H1 - The items include an old electricity commission sign and concrete blocks.
Criterion	Assessment
a	These items are common elements of twentieth century infrastructure. There is nothing to suggest that either of these items are important in the course or pattern of NSW's cultural or natural history. These items are assessed as not having significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or group of persons of local or state importance. These items are assessed as not having significance against this criterion.
c	Neither of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. These items are assessed as not having significance against this criterion.
d	The items have no known strong or special associations with a particular community or cultural group. These items are assessed as not having significance against this criterion.
e	The items do not have potential to yield information that will contribute to an understanding of NSW's cultural or cultural history (or the local areas). These items are assessed as not having significance against this criterion.
f	Items such as these are common features across the Snowy Mountains and NSW as a whole. These items are assessed as not having significance against this criterion.
g	The items are not in good condition and are not representatives of a class of NSW's cultural or natural places or cultural or natural environments. These items are assessed as not having significance against this criterion.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Gooandra Hill in accordance with the themes they represent.

Table 70 Overview of significance rankings for heritage items at Gooandra Hill.

Pastoral items	General Ranking	Archaeological Ranking	Comments
GHSU1/H3	Negligible	Negligible	GHSU1/H3 is an excavated depression that may be a dugout spring. It has no identifiable archaeological deposits in association with it. It has negligible contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
GHSU1/H2	Little	Negligible	GHSU1/H2 is a costean associated with Kiandra gold mining. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
GHSU7/H1	Little-Moderate	Little	GHSU7/H1 is a water race associated with Kiandra gold mining. The condition of this feature is fair, although it has relatively limited archaeological potential. The race has little to moderate contributory significance within the context of the broader mining landscape.
SMA Items	General Ranking	Archaeological Ranking	Comments
Gooandra Trig	Moderate	Negligible	Gooandra Trig is a survey marker that is in a good condition. It has no identifiable archaeological deposits in association with it. This item is not assessed as having heritage significance of itself. However, it is assessed as having moderate contributory significance as part of the broader SMA landscape.
Transport	General Ranking	Archaeological Ranking	Comments
DMR Roadman's Hut	Moderate	Moderate-High	DMR Roadman's Hut is comprised of a well preserved stone hearth and a hut platform with potential for relatively intact archaeological deposits. This is a locally rare site type with potential to contribute to an understanding of the history of the DMR and associated road construction logistics in the Snowy Mountains. It is assessed as having moderate to high contributory significance as part of the broader transport landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
GHSU12/H1	Negligible	Negligible	GHSU12/H1 is an old electricity commission sign. It has no predicted associated archaeological deposit. It has negligible contributory significance.

GHSU13/H1	Negligible	Negligible	GHSU13/H1 is a collection of concrete blocks of unknown function and age. It has no predicted associated archaeological deposit. It has negligible contributory significance.
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8.2.4 Kings Cross Road

The potential heritage items recorded at the Kings Cross Road survey area largely comprise items relating to pastoralism and the SMA. The road and adjacent areas are highly disturbed along much of its length as a result of previous usage by the SMA during the construction works of the original scheme. A significance assessment of the Kings Cross historical heritage items is presented in the tables below.

Table 71 Overview of significance assessment for Kings Cross Road.

Pastoral Items	KCSU2/H1, KCSU5/H1, KCSU7/H1 & KCSU7/H2 - The items include remains of stock fences.
Criterion	Assessment
a	There are no known historical associations for any of these features. While the items relate to twentieth century, and possibly late nineteenth century pastoral activities, they cannot be identified as important pastoral components. The items are assessed as not having significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	The items recorded in this group are fence lines, or remnants thereof. While recording of these features would contribute to an overall archive of fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains.
f	The pastoral items within the Kings Cross survey area comprise remnants of common elements of the pastoral landscape. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable, important historical or social associations. The items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The pastoral items in this survey area are not associated with potential archaeological deposits. In summary, all the items form part of a broader landscape of features relating to the

	theme of pastoralism and have contributory significance in that context against criteria c, e and g.
SMA Items	KCSU7/H4, KCSU7/H5, KCSU7/H6 & KCSU7/H7 – These items comprise a former SMA camp site (KCSU7/H7) and three SMA stone quarries.
Criterion	Assessment
a	These items are a component of the construction activities of the SMA. The Snowy Mountains Scheme continues to be recognised as an important component of the local area's history as well as significant in the development of NSW and the nation. However, the items are not of themselves an important component of the Snowy Mountains Scheme and are of contributory significance only against this criterion.
b	While the items are all associated to some extent with the work undertaken by people employed by SMA, there are no known, or identifiable special associations between these items and the SMA.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Nevertheless, the quarries in particular do form part of a broader SMA landscape that is noted in terms of technical engineering achievements at a national level. These items are assessed as having local contributory significance against this criterion.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	The stone quarry items are not associated with any identifiable archaeological deposits. The Kings Cross SMA camp (KCSU7/H7) is however likely to do so, although the integrity of such deposits is unclear. This item may have potential to yield information that will contribute to an understanding of the accommodation and living conditions for SMA workers. KCSU7/H7 is assessed as having local significance against this criterion.
f	SMA quarries and camp sites are relatively common features in the KNP, and similar items are common across NSW. These items are assessed as not having significance against this criterion.
g	The quarries are all readily interpretable as items associated with the SMA. While there are many similar items present across the Snowy Mountains, these items contribute to a broader set of features representative of SMA construction and engineering activities. It is however unclear to what extent the camp site (KCSU7/H7) is representative of an SMA camp – further investigation (e.g. excavation) is required in order to fully assess this item. All of the Kings Cross SMA items are assessed as having local contributory significance against this criterion.
Statement of Significance	The quarries and camp site are common site types and have no known strong or special historical or social associations of themselves. The items have contributory significance against criteria a, b c and g as part of the broader landscape of the SMA, and specifically as part of the evidence of construction activities. The Kings Cross SMA camp site also has local significance against criterion e.
Miscellaneous Items	KCSU7/H3 a concrete post support.
Criterion	Assessment
a	There is nothing to suggest that this item has any importance in the course or pattern of local or NSW events. The item is assessed as not having significance against this criterion.
b	The item has no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the

	local area's) cultural or natural history. The item is assessed as not having significance against this criterion.
c	The item does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, it does not display any landmark qualities within the broader landscape. The item is assessed as not having significance against this criterion.
d	The item does not have any known strong or special associations with a particular community or cultural group in NSW or the local area. The item is assessed as not having significance against this criterion.
e	The item is not associated with potential archaeological deposits. Further investigation of this item is unlikely to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history.
f	The item cannot be considered uncommon or rare at either local or state levels.
g	The item is not important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	The item has no known, or identifiable important historical or social associations. It is a common site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents very limited/negligible research potential. As such, the item does not fulfil the criteria for listing at either a local or State level.

The following table presents a significance ranking of each potential historic item at Kings Cross Road in accordance with the themes they represent.

Table 72 Overview of significance rankings for heritage items at Kings Cross Road.

Pastoral items	General Ranking	Archaeological Ranking	Comments
KCSU2/H1	Little-moderate	Negligible	KCSU5/H1 is a remnant portion of fencing that comprises 11 posts. There are no predicted associated archaeological deposits in this location. This item has little-moderate contributory significance within the context of the broader pastoral landscape.
KCSU5/H1	Little	Negligible	KCSU5/H1 is a remnant portion of fencing that comprises two posts. There are no predicted associated archaeological deposits in this location. This item has little contributory significance within the context of the broader pastoral landscape.
KCSU7/H1	Little	Negligible	KCSU7/H1 is a remnant portion of fencing that comprises one post with fire damage. There are no predicted associated archaeological deposits in this location. This item has little contributory significance within the context of the broader pastoral landscape.
KCSU7/H2	Little	Negligible	KCSU7/H2 is a remnant portion of fencing that comprises a corner posts with fire

			damage and no predicted associated archaeological deposit. This item has little contributory significance within the context of the broader pastoral landscape.
SMA Items	General Ranking	Archaeological Ranking	Comments
KCSU7/H4	Little	Negligible	KCSU7/H4 is a stone quarry that is no longer visible. It is unlikely to have archaeological deposits in association with it. This item is not assessed as having heritage significance of itself. However, it is assessed as having little contributory significance as part of the broader SMA landscape.
KCSU7/H5	Moderate	Negligible	KCSU7/H4 is a relatively intact and undisturbed stone quarry. It is unlikely to have archaeological deposits in association with it. This item is not assessed as having heritage significance of itself. However, it is assessed as having moderate contributory significance as part of the broader SMA landscape.
KCSU7/H6	Little-moderate	Negligible	KCSU7/H6 is a disturbed stone quarry currently used as a dump site. It is unlikely to have archaeological deposits in association with it. This item is not assessed as having heritage significance of itself. It is assessed as having little to moderate contributory significance as part of the broader SMA landscape.
KCSU7/H7	Little-moderate	Moderate	KCSU7/H7 is a former SMA camp site. It is likely to have archaeological deposits in association with it, although the integrity of such deposits is not clear. The site has the potential to address research questions relating to accommodation and living conditions for SMA workers. This item is assessed as having moderate contributory significance (particularly archaeological) as part of the broader SMA landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
KCSU7/H3	Negligible	Negligible	KCSU7/H3 is concrete post support. It has no predicted associated archaeological deposit. It has negligible contributory significance to the broader cultural landscape.

8.2.5 Link Road

The potential heritage items recorded at the eastern end of the Link Road survey area largely relate to Kiandra gold mining and transport. A significance assessment of the Link Road historical heritage items is presented in the tables below.

Table 73 Overview of significance assessment for heritage items at Link Road.

Pastoral Items	LSU5/H1 - An old stock fence.
Criterion	Assessment
a	The item appears to relate to early to mid-twentieth century pastoral occupation. There are no known important historical associations. This item is assessed as not having significance against this criterion.
b	The item has no known or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	The item does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	The item does not have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	The item is a remnant fence line. While recording of this feature would contribute to an overall archive of fencing types and associated chronologies, its research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains.
f	The item is not uncommon or rare within KNP or the broader landscape of NSW.
g	The item is not particularly representative or a well-preserved examples of its type and is not important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	The item has no known, or identifiable, important historical or social associations. The item is a common feature/site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The item is not associated with potential archaeological deposits. As such, the item does not meet any of the heritage criteria. Nevertheless, this item forms part of a broader landscape of features relating to the theme of pastoralism and has local contributory significance in that context against criteria c, e and g.
Mining Items	LSU3/H1, NC9, NC18, NC19, NC24 and NC93 – These items include an area of heavily worked mining, tailing mounds, boiler stacks, mining equipment and a costean.
Criterion	Assessment
a	This complex of mine workings form part of the broader mining landscape of Kiandra. Further research is required into associated mine records in order to fully assess these items in terms of their importance in the course or pattern of NSW's (or the local area's) cultural or natural history. However, these items have good potential to be important at a local level against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. Further research into associated mine records is necessary in order to fully assess these items against this criterion.
c	While most of these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of a broader mining landscape that has landmark qualities. The mining equipment at NC93 includes a complete standing battery that forms a dominant feature at the eastern end of Link Road. This item, together with the broader

	complex of mining items along Link Road are assessed as having local significance against this criterion.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	These items form part of a broader landscape that has demonstrated potential to yield information that will contribute to an understanding of nineteenth and early twentieth century mining in the Snowy Mountains. Detailed survey and/or excavation of these features (e.g. trenches across mining features such as water races) has the potential to yield information that will contribute to an understanding of the engineering and phasing of mining in the local area.
f	Mining features are common across the Kiandra landscape, the broader KNP landscape and NSW as a whole. While most of the features do not have local or state significance against this criterion, the machinery at NC93 does include a locally rare example of a complete battery stamper. This item is assessed as having local significance against this criterion, the other items have contributory significance only.
g	This group of items comprises a set of features typical of different aspects of alluvial mining (prospecting, water management, surface workings, ground sluicing and ore processing). As a group they form part of a wider landscape at the eastern end of Link Road that is representative of nineteenth century gold mining. They contribute to the broader Kiandra landscape, which is important in demonstrating mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. The Kiandra landscape is also arguably of importance at a state level as an example of diverse complex of alluvial mining dating back to the mid-nineteenth century. As such, these items have at least contributory significance as part of a landscape that has local, if not state significance against this criterion.
Statement of Significance	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criterion g, and local significance against criteria c and e due to their overall landmark qualities and potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Items relating to transport	LSU4/H1, LSU5/H2, NC1, NC3, NC4, NC8, NC16, NC20, NC21, NC22 & NC23 – these items are old roads, paths and tracks, culverts and bridges.
Criterion	Assessment
a	The items comprise old roads, paths and tracks, culverts and a bridge and footbridge which date back to the mid-nineteenth century. They form part of the transport network around the Kiandra gold fields. While the portions of these items that are present within the survey area are not clearly identifiable with important events or patterns in local or state history, they are part of a larger complex of features that are important in the theme of the development of transport and communication in the Snowy Mountains.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's

	(or the local area's) cultural or natural history. However, it is recognised that potential for such associations exists and may be revealed through additional research.
c	The items do not generally demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. They do however contribute to the broader landscape of transport and communication in KNP.
d	The items do not have strong or special association with a particular community or cultural group.
e	Portions of former nineteenth century road alignments, culverts and bridge elements are not generally recognised as items with significant archaeological research potential. However, further research into these items and detailed survey of the features and their broader landscape setting may contribute to an understanding of nineteenth century transport routes and associated communications networks. These items are assessed as having local significance against this criterion.
f	Portions of former road alignments, culverts and bridge elements from the nineteenth century are not uncommon within the KNP. Such sites are also relatively common across the broader NSW landscape. However, as a group, these items form a complex of different phases of transport routes that span many decades. The presence of such a range of transport features within a discrete area is not particularly common, even within the KNP, where such items tend to be protected from development related impacts. As such, this group of items is assessed as having local significance against this criterion.
g	This group of items represent a range of transport related features that span many decades of use. They are a collectively good set of different forms transport routes and associated infrastructure. They are assessed as having local significance against this criterion.
Statement of Significance	The items are part of a larger complex of features that are important in the theme of the development of transport and communication in the Snowy Mountains. As a group these items form a key component of the broader landscape of transport and communication. They also have potential to contribute to an understanding of nineteenth century transport routes and associated communications networks. The identified transport related items collectively form a group that is relatively rare at a local scale in that they represent a range of different infrastructure that span many decades of use. This group of items are of local significance against criteria e, f and g, and local contributory significance against criteria a, and c. They also have potential local significance against criterion b.
Miscellaneous Items	NC5, NC6, NC7, NC10, NC11, NC12, NC13, NC14, NC15, NC17, NC26, LSU5/H3, LSU5/H4 & LSU5/H5 – These include posts, a telegraph pole, modern memorial and old depot/laydown area.
Criterion	Assessment
a	The historical associations for these items are generally unclear. None of these items have clear importance in the course or pattern of NSW's (or the local area's) cultural or natural history.
b	The items have no known, or identifiable strong or special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).

d	The items do not have any known strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	There are no identified potential archaeological deposits associated with these items. Furthermore, the unclear historical associations for these items mean that their potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history is limited.
f	These items in this group are all relatively common features across NSW and the Snowy Mountains region.
g	Most of these items are fragmentary in nature (e.g. burnt post remains), and none of them can be categorised as representative of a class of NSW's cultural or natural places or cultural or natural environments. These items are assessed as not having significance against this criterion.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential heritage item at Link Road in accordance with the themes they represent.

Table 74 Overview of significance rankings for heritage items at Link Road.

Pastoral item	General Ranking	Archaeological Ranking	Comments
LSU5/H1	Little-Moderate	Negligible	LSU5/H1 is a stock fence with no predicted associated archaeological deposit. The fence is in poor condition. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
LSU3/H1	Moderate	Little	LSU3/H1 is a mining area of hillocks associated with Kiandra gold mining. It is in poor condition and does not have a strong visual presence in the landscape. The feature has little archaeological potential. The item has moderate contributory significance within the context of the broader mining landscape.
NC9	Moderate	Little	NC9 is an area of tailings mounds associated with Kiandra gold mining. The features at this item are in fair to good condition and have a relatively strong visual presence in the landscape. While archaeological potential at this item is limited, it has moderate contributory significance within the context of the broader mining landscape.

NC18	Little-Moderate	n/a	NC18 are boiler stacks associated with Kiandra gold mining. The items are not <i>in situ</i> and there is no archaeological potential associated with them. The item has little-moderate contributory significance within the context of the broader mining landscape.
NC19	Little-Moderate	Little	NC19 is a costean associated with Kiandra gold mining. It does not have a strong visual presence in the landscape. It has very limited archaeological potential. This feature has little to moderate contributory significance within the context of the broader mining landscape.
NC24	Moderate-High	Moderate	NCTSU23/H6 comprises components of mine workings that are part of the broader mining landscape at Kiandra; it has a relatively high visual presence in the landscape. While the potential for archaeological deposits is limited, the surface features are relatively intact and present the potential to yield information relating to mining phases and types. This item has moderate to high contributory significance within the context of the broader mining landscape.
NC93	High	Negligible	NC93 comprises a collection of mining equipment on display in a picnic area at Kiandra. Archaeological potential in this area is limited. The items have been removed from their original context, but they have a very striking presence in the landscape and include relatively rare and representative examples of ore processing equipment. These items have high contributory significance within the context of the broader mining landscape.
Items relating to transport	General Ranking	Archaeological Ranking	Comments
LSU4/H1	Moderate	Little-Moderate	LSU4/H1 is section of old road and culvert with drainage ditches and some areas of granite paving. While the culvert appears a recent addition, the road itself might date to the late nineteenth to early twentieth century. Some archaeological potential for relics has been identified in association with this item. Overall the item has moderate contributory significance within the context of the broader landscape of transport and communications.

LSU5/H2	Little	Negligible	LSU5/H2 is a concrete pipe culvert with very limited potential for associated archaeological deposits. This item has little contributory significance within the context of the broader landscape of transport and communications.
NC1	Little-Moderate	Little	NC1 is a track alignment between gold workings on the upper slopes and Link Road below. The track shows signs of more recent modifications including some modern culverts and surfacing. Archaeological potential in association with this item is limited. This item has little to moderate contributory significance within the context of the broader landscape of transport and communications.
NC3	Little-Moderate	Little	NC3 is a 3m wide track alignment that parallels NC1 for 50m, at which point NC1 truncates NC3. before being with no predicted associated archaeological deposit. Archaeological potential in association with this item is limited. This item has little to moderate contributory significance within the context of the broader landscape of transport and communications, and the broader mining landscape.
NC4	Little-Moderate	Little-Moderate	NC4 appears to be a portion of a relatively early path/track (1.5-2m wide) that is truncated by features such as NC3. While the potential for associated relics is limited, excavation through the feature itself may yield information relating to construction/use of an early phase of mining access routes. This item has little to moderate contributory significance within the context of the broader landscape of transport and communications, and the broader mining landscape.
NC8	Little	Little	NC8 is a remnant path/track alignment of unknown age. While the track may originally relate to mining activities, it shows evidence of more recent wheel ruts along its length and it has been impacted by land rehabilitation works at the eastern end. This item has little contributory significance within the context of the broader landscape of transport and communications.

NC16	Moderate	Little-Moderate	NC16 is a track alignment that leads up towards a former hut site. There are various artefacts visible along the surface of the track and it is likely that additional items occur along this feature, although the integrity of potential archaeological deposits is unclear. This item has moderate contributory significance within the context of the broader landscape of transport and communications.
NC20	Little-Moderate	Little	NC20 is a road/track alignment associated with the ford/creek crossing at NC21. It is truncated upslope of the creek crossing by the modern road alignment. Archaeological potential at this feature is predicted to be limited. This item has little to moderate contributory significance within the context of the broader landscape of transport and communications.
NC21	Moderate-High	Negligible	NC21 is a ford/creek crossing across Bullocks Head Creek that is associated with the track at NC20. While archaeological potential at this item is very limited, the feature contributes to an understanding of broader access/transport routes as evidence of former a former location for crossing Bullocks Head Creek. As such, it may be integral to understanding the alignments of other track portions. This item has moderate to high contributory significance within the context of the broader landscape of transport and communications.
NC22	Moderate-High	Negligible	NC22 is a concrete and steel bridge with no predicted associated archaeological deposit. It forms part of the former Cooma-Tumut Road and dates to themed twentieth century. A SMA survey marker is incorporated into its southern side. The bridge is in relatively good condition. This item has moderate to high contributory significance within the context of the broader landscape of transport and communications and SMA activities.

NC23	Moderate-High	Little-Moderate	NC23 comprises the stone and earthen embankments of a foot bridge thought to date to 1890. Extant features include remnant timbers, earthworks and well-defined stone edging along portions of the associated track. The item is in relatively good condition. Archaeological potential is uncertain, but it is likely that excavation and detailed survey would contribute to an understanding of the age and construction of the feature. This item has moderate to high contributory significance within the context of the broader landscape of transport and communications, and the broader mining landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
NC5, NC6, NC7, NC10, NC11, NC12, NC13, NC14, NC15, NC17 and LSU5/H5	Little	Negligible	These items are post/poles of uncertain function. They are potentially the remains of a former telegraph/power line along the northern side of Link Road. The age of the items is unclear, and the posts are generally in poor condition with very limited associated archaeological potential. These items have little contributory significance to the broader cultural landscape.
NC26	Little-moderate	Negligible	NC26 is a fallen telegraph pole with brown and white ceramic insulators. The item appears to date to the twentieth century and is in poor condition. Archaeological potential at this feature is predicted to be negligible. This item has little to moderate contributory significance to the broader cultural landscape.
LSU5/H3	Negligible	n/a	LSU5/H3 is a modern memorial plaque. It has negligible contributory significance to the broader cultural landscape.
LSU5/H4	Little-moderate	Little	LSU5/H4 is laydown area of uncertain history. It may be associated with SMA or DMR. While various artefacts are present across the surface of this site, it also shows signs of disturbance and contains various modern items and appears to be contaminated with asbestos sheeting. This item has little to moderate contributory significance to the broader cultural landscape.

8.2.6 Gooandra Fire Trail

The potential heritage items recorded at the Gooandra Fire Trail survey area largely comprise items relating to pastoralism and elements of the broader Kiandra mining

landscape. A significance assessment of the Gooandra Fire Trail historical heritage items is presented in the tables below.

Table 75 Overview of significance assessment for Gooandra Fire Trail.

Pastoral Items	GSU1/H1, GSU1/H2 (stock yards), GSU2/H1, GSU6/H2, GSU15/H3, GSU15/H4, GSU19/H1 & GSU22/H2 - The items include remains of fences and stock yards.
Criterion	Assessment
a	There are no known historical associations for any of these features. While the items relate to twentieth century, and possibly late nineteenth century pastoral activities, they cannot be identified as important pastoral components. These items are all assessed as not having significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. They do however contribute to the broader pastoral landscape, and as such have local contributory significance against this criterion.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	The items recorded in this group are fence lines, or remnants thereof, and a set of stock yards,. While recording of these features would contribute to an overall archive of fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains. However, the stockyards (GSU1/H2) site has an earth mound and post holes suggestive of a structure and hence, has additional potential to contain archaeological deposits. Excavation at this item may yield information relating to transhumance and associated accommodation requirements and the broader topic of organisation of resources within the context of summer grazing in the Snowy Mountains.
f	The pastoral items within the Gooandra Fire Trail survey area comprise remnants of common elements of the pastoral landscape. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Most of these pastoral items are not associated with potential archaeological deposits. In summary, the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context. The stockyards (GSU1/H2) site and its earth mound is assessed to be of local heritage significance against criterion e due to the potential to yield information relating to summer grazing in the Snowy Mountains. The other items are assessed to have contributory significance against

	criterion e, and the complex as a whole has contributory significance against criteria c and g.
Mining Items	GSU4/H2, GSU4/H3, GSU4/H4, GSU4/H5, GSU4/H6, GSU5/H2, GSU6/H1, GSU7/H1, GSU7/H3, GSU7/H5, GSU7/H6, GSU7/H7, GSU7/H8, GSU20/H1, GSU22/H1, GSU22/H4, GSU22/H5 and GSU6M – All of these items are mining features such as water races, costeans, channels, tailings mounds and broader landscapes such as GSU6M (Six Mile Diggings) and the Tantangara Diggings.
Criterion	Assessment
a	This group comprises the mining landscapes of Six Mile Diggings and Tantangara diggings and associated features that form part of the broader Kiandra gold fields mining landscape which dates back to the mid nineteenth century and is a significant element in the history of the Snowy Mountains. There is very little historic synthesis relating to these areas, and given their extent, they comprise relatively extensive components of the Kiandra mining. Further research and analytical mapping would be required in order to fully assess these items. They are, at a minimum, assessed as having local contributory significance against this criterion and/or potential local significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. Further research into associated mine records is necessary in order to fully assess these items against this criterion.
c	Collectively these items form the mining landscapes of Six Mile Diggings and Tantangara diggings and associated features that form part of the broader Kiandra gold fields mining landscape. While most of the recorded features may not have notable aesthetic characteristics in their own right, they collectively have landmark qualities, and as such have local significance against this criterion.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	These items form part of a broader landscape that has demonstrated potential to yield information that will contribute to an understanding of nineteenth and early twentieth century mining in the Snowy Mountains. In particular, the extensive Six Mile Diggings are complex and well preserved with good archaeological potential. Detailed survey and/or excavation of these features (e.g. trenches across mining features) has the potential to yield information that will contribute to an understanding of the engineering and phasing of mining in the local area. Features such as GSU7/H1 (hut ruin) also display very good archaeological potential and are likely to yield information that would contribute to an understanding of the construction and use of mining accommodation at Kiandra.
f	While mining features are common across the Kiandra landscape, the broader KNP landscape and NSW as a whole, the group of items recorded within the Gooandra Fire Trail survey area represents a complex of interrelated items with research potential and landmark qualities. Moreover, the items are examples of satellite mining activities away from the main Kiandra diggings. As such, this group is a more unusual set of features, which combined with the levels of preservation noted across some features, means the complex is of local significance against this criterion.
g	Both the Six Mile Diggings and Tantangara Diggings are relatively undisturbed and intact mining landscapes and are accordingly notable in

	terms of their representativeness. They also contribute to the broader Kiandra landscape, which is important in demonstrating mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. The complex of mining features recorded within the Gooandra Fire Trail survey area also represents a complex of interrelated items representative of satellite mining activities away from the main Kiandra diggings. As such, these features collectively have local significance against this criterion.
Statement of Significance	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. Many of the features identified within this group also demonstrate research potential in their own right (e.g. with regard to miners' residences, and the broader potential to yield information relating to phases and types of mining at Kiandra and the associated engineering) and/or are significant components of the landscape with landmark qualities. The group is also collectively a relatively rare and good example of satellite mining endeavours away from the main Kiandra diggings. While further research is necessary to fully assess their potential significance against criteria a and b, the group has local significance against criteria c, e, f and g. due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Items relating to transport	GSU1/H3, GSU5/H1, GSU7/H2, GSU7/H4, GSU9/H1, GSU15/H1, GSU15/H2, GSU15/H5, GSU16/H1, GSU21/H2 – old tracks/roads.
Criterion	Assessment
a	The items comprise portions of old tracks including a possible section (north end) of a c. 1900 Dray Track (see KHA historic routes). These tracks formed part of the transport network between early pastoral properties and the gold fields. While the portions of this track that are present within the survey area are not clearly identifiable with important events or patterns in local or state history, they are part of a larger feature that is important in the theme of the development of transport and communication in the Snowy Mountains.
b	The portions of the old tracks have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. However, it is recognised that potential for such associations exist and may be revealed through additional research.
c	Most of these items do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. However, collectively they contribute to the broader landscape of transport and communications.
d	These items do not have strong or special association with a particular community or cultural group.
e	Portions of former nineteenth or later twentieth century road alignments are not generally recognised as items with significant archaeological research potential. Moreover, many of the identified portions of tracks show signs of disturbance that further reduce any limited research potential these items may have. Collectively, the items have local contributory significance against this criterion.
f	Portions of former road alignments from the nineteenth century and later twentieth century are not uncommon within the KNP. Such sites are also relatively common across the broader NSW landscape.

g	The portions of the tracks recorded within this survey area are mostly vestigial and disturbed by erosion and subsequent phases of road formation and maintenance. As such, these items are not representative components of the track to which they relate, or the broader class of nineteenth century tracks within the KNP. However, GSU5/H1 displays well preserved and interesting features (such as stone walled shoring). The items as a group have local contributory significance against this criterion
Statement of Significance	The items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria in their own right. Nevertheless, these items form part of a broader landscape of features relating to the theme of transport, mining and pastoralism and have contributory local significance in that context against criteria a, c, e and g, and potential local significance against criterion b.
Miscellaneous Items	GSU3/H1, GSU4/H1, GSU21/H1 and GSU22/H3 - The items include areas of scalped earth of unknown purpose and metal debris.
Criterion	Assessment
a	The historical associations for these items are unclear. However, they are not of themselves important in the course or pattern of NSW's (or the local area's) cultural or natural history.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or natural history.
c	The items do not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The items do not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	There are no identified potential archaeological deposits associated with these items. Furthermore, the unclear historical associations for these items mean that their potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history is negligible.
f	These items are not uncommon or rare at either a local or state level.
g	It is not clear what period of use or site type these items relate to. As such, none of them can be considered important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Gooandra Fire Trail in accordance with the themes they represent.

Table 76 Overview of significance rankings for heritage items at Gooandra Fire Trail.

Pastoral items	General Ranking	Archaeological Ranking	Comments
GSU1/H1	Little	Negligible	GSU1/H1 is an old fence line in very poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
GSU1/H2	Moderate-High	High	GSU1/H12 is a set of old stock yards evidence by extant posts, post holes and other pieces of fencing (e.g. wire). While the yards themselves are in poor condition, they are associated with an earth feature that appears to be a hut site. GSU1/H12 has high potential for subsurface archaeology, including deposits and artefacts relating to occupation and post holes that would potentially inform the layout, age and operation of the yards. The site has high contributory significance (particularly archaeological) within the context of the broader pastoral landscape and the associated theme of transhumance.
GSU2/H1	Little	Negligible	GSU2/H1 is an old fence line in very poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
GSU6/H2	Little	Negligible	GSU6/H2 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
GSU15/H3	Little	Negligible	GSU15/H3 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
GSU15/H4	Little	Negligible	GSU15/H4 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within

			the context of the broader pastoral landscape.
GSU19/H1	Little	Negligible	GSU19/H1 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
GSU22/H2	Little	Negligible	GSU22/H2 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
GSU4/H2	Moderate	Little-Moderate	GSU4/H2 is a water channel and associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is well preserved, and archaeological investigation (e.g. detailed survey and/or excavation) is likely to be able to answer questions relating to the construction and function of mining features at Six Mile. This item has moderate contributory significance within the context of the broader mining landscape.
GSU4/H3	Moderate to High	Moderate to High	GSU4/H3 is a water channel and associated former ponds associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is well preserved, and archaeological investigation (e.g. detailed survey and/or excavation) is likely to be able to answer questions relating to the construction and function of these features. This item has moderate to high contributory significance within the context of the broader mining landscape.
GSU4/H4	Moderate	Little	GSU4/H4 is an area of mine workings associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is partially eroded, and as such it has limited archaeological potential. The item has moderate contributory significance within the context of the broader mining landscape.

GSU4/H5	Moderate	Little	GSU4/H5 is an area of mining pits associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is good, but potential for archaeological investigations is limited. It has a strong visual presence in the Six Mile Diggings area. The item has moderate contributory significance within the context of the broader mining landscape.
GSU4/H6	Moderate	Moderate	GSU4/H6 is an area of ponds associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is good, and archaeological investigation (e.g. detailed survey and/or excavation) is likely to be able to answer questions relating to the construction and function of these features. This item has moderate contributory significance within the context of the broader mining landscape.
GSU5/H2	Moderate	Little	GSU5/H2 is an area of mining pits associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is good, but potential for archaeological investigations is limited. It has a strong visual presence in the Six Mile Diggings area. The item has moderate contributory significance within the context of the broader mining landscape.
GSU6/H1	Moderate to High	Moderate	GSU6/H1 is an area of diggings/mining including an extensive drainage channel associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is well preserved, and archaeological investigation (e.g. detailed survey and/or excavation) is likely to be able to answer questions relating to the construction and function of these features. This item has moderate to high contributory significance within the context of the broader mining landscape.
GSU7/H1	Moderate	Moderate to High	GSU7/H1 is a stone feature (possible hearth) associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is well preserved, and it has good archaeological potential. The item has

			moderate to high contributory significance (particularly archaeological) within the context of the broader mining landscape.
GSU7/H3	Moderate	Little	GSU7/H3 is a water race associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is poor and it has limited archaeological potential. The item has moderate contributory significance within the context of the broader mining landscape.
GSU7/H5	Moderate	Little	GSU7/H5 is a mining pit or borrow pit associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is good, but it has limited archaeological potential. The item has moderate contributory significance within the context of the broader mining landscape.
GSU7/H6	Moderate	Little to Moderate	GSU7/H6 is a water race associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is fair and it has some archaeological potential. The item has moderate contributory significance within the context of the broader mining landscape.
GSU7/H7	Moderate	Little to Moderate	GSU7/H7 is an area of tailings mounds associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is well preserved, and archaeological investigation (e.g. detailed survey and/or excavation) is likely to be able to answer questions relating to the formation of these features. This item has moderate contributory significance within the context of the broader mining landscape.
GSU7/H8	Moderate	Little to Moderate	GSU7/H8 is a water race associated with the Six Mile Diggings in the Kiandra mining landscape. The condition of this feature is good archaeological investigation (e.g. detailed survey and/or excavation) may to be able to answer questions relating to the construction and function of mining features at Six Mile. This item has moderate contributory significance within the context of the broader mining landscape.
GSU20/H1	Moderate to High	Moderate	GSU20/H1 is an extensive area of mining associated with remains of an

			old road and a possible stone ruin associated with the Tantangara Diggings in the Kiandra mining landscape. The condition of this item is good and archaeological investigation (e.g. detailed survey and/or excavation) is likely to be able to answer questions relating to the construction and function of mining features at Tantangara. This item has moderate to high contributory significance within the context of the broader mining landscape.
GSU22/H1	Moderate	Little to Moderate	GSU22/H1 is a water race associated with the Tantangara Diggings in the Kiandra mining landscape. The condition of this feature is very good and it has some archaeological potential. It has a strong visual presence in the Tantangara Creek valley. The item has moderate contributory significance within the context of the broader mining landscape.
GSU22/H4	Moderate	Little	GSU22/H4 is an area of tailings mounds associated with the Tantangara Diggings in the Kiandra mining landscape. The condition of this feature is good, and archaeological investigation (e.g. detailed survey and/or excavation) may to be able to answer questions relating to the formation of these features. The item has moderate contributory significance within the context of the broader mining landscape.
GSU22/H5	High to Exceptional	Moderate to High	GSU22/H5 is an extensive area of tailings mounds, paddocking and channels associated with the Tantangara Diggings in the Kiandra mining landscape. The area is undisturbed and displays very good research potential as an item representative of an area of satellite mining beyond the main Kiandra Diggings. The item has high to exceptional contributory significance within the context of the Tantangara mining landscape and the broader Kiandra Landscape.
GSU6M	High to Exceptional	Moderate to High	GSU6M is an extensive area of mining activity and features associated with the Six Mile Diggings in the Kiandra mining landscape. The area is relatively

			undisturbed and displays very good research potential as an item representative of an area of satellite mining beyond the main Kiandra Diggings. The item has high to exceptional contributory significance within the context of the Six Mile Diggings mining landscape and the broader Kiandra Landscape.
Items relating to transport	General Ranking	Archaeological Ranking	Comments
GSU1/H3	Little-Moderate	Negligible	GSU1/H3 is a track alignment with no predicted associated archaeological deposit. The track is in poor condition. This section of track has little-moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU5/H1	Moderate	Negligible to Little	GSU5/H1 is a track alignment with limited predicted associated archaeological deposit. The track is in variable condition with some sections eroded and others containing relatively intact stone wall shoring. This section of track has moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU7/H2	Little-Moderate	Negligible	GSU7/H2 is a track alignment with no predicted associated archaeological deposit. The track is in poor condition. This section of track has little-moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU7/H4	Moderate	Negligible	GSU7/H4 is a section of the original Gooandra Track. It is a well defined feature with a relatively strong visual presence. It has moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU9/H1	Little-Moderate	Negligible	GSU9/H1 is a track alignment of uncertain age with no predicted associated archaeological deposit. The track is in poor condition. This section of track has little to moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU15/H1	Little-Moderate	Negligible	GSU15/H1 is a track alignment of uncertain age with no predicted associated archaeological deposit. The track is in poor condition. This section

			of track has little to moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU15/H2	Little-Moderate	Negligible	GSU15/H2 is an access track to Gooandra Homestead of uncertain age. It has very limited potential for associated archaeological deposits. The track is in fair condition. This section of track has little to moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU15/H5	Little-Moderate	Negligible	GSU15/H5 is a track alignment with limited potential for associated archaeological deposits. The track has been cut in places by the modern road, but other sections remain well preserved. Overall this track has little to moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU16/H1	Little-Moderate	Negligible	GSU16/H1 is a track alignment with no predicted associated archaeological deposit. The track is in poor condition. This section of track has little-moderate contributory significance relating to transport within the context of the broader mining landscape.
GSU21/H2	Moderate	Negligible	GSU7/H4 is a section of the original Gooandra Track. It is a relatively well-defined feature, albeit overgrown. It has moderate contributory significance relating to transport within the context of the broader mining landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
GSU3/H1	Negligible	Negligible	GSU3/H1 is a scalped area of uncertain function with no predicted associated archaeological deposit. The historical context of the item is unclear. It has little negligible contributory significance.
GSU4/H1	Negligible	n/a	GSU4/H1 is a metal pipe of uncertain function with no predicted associated archaeological deposit. The historical context of the item is unclear. It has little negligible contributory significance.
GSU21/H1	Negligible	Negligible	GSU21/H1 is a scalped area of uncertain function with no predicted associated archaeological deposit. The historical context of the item is unclear.

			It has little negligible contributory significance.
GSU22/H3	Negligible	Negligible	GSU22/H3 comprises metal debris from the early twentieth century protruding from a creek depression. There is very limited potential for associated archaeological deposits. The historical context of the item is unclear. It has little negligible contributory significance.

8.2.7 Nungar Creek Fire Trail

The potential heritage items recorded at the Nungar Creek Fire Trail survey area comprise items relating to pastoralism. A significance assessment of the Nungar Creek Fire Trail historical heritage items is presented in the tables below.

Table 77 Overview of significance assessment for Nungar Creek Fire Trail.

Pastoral Items	NSU3/H1 (hut site), NSU3/H2 & NSU4/H1, - The items include an unnamed hut site (with no material evidence) remains of fences.
Criterion	Assessment
a	There are no known historical associations for any of these features. While the items relate to twentieth century, and possibly late nineteenth century pastoral activities, they cannot be identified as important pastoral components. These items are all assessed as not having significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	The items recorded in this group include an unnamed hut site without physical evidence, fence lines, or remnants thereof. While recording of these features would contribute to an overall archive of summer grazing and fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains. However, the hut site may have potential for relatively intact archaeological deposits that would potentially provide information relating to the phasing, duration and nature of pastoral occupation. Such information would potentially contribute to an understanding of the later phases of pastoral use prior to the formation of the KNP.
f	The pastoral items within the Nungar Creek Fire Trail survey area comprise remnants of common elements of the pastoral landscape. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of

	NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	<p>These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.</p> <p>In summary, the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context. The hut site is potentially of local significance against criterion e due to the potential to yield information relating to phasing, duration and nature of pastoral occupation in the Snowy Mountains.</p>

The following table presents a significance ranking of each potential historic item at Nungar Creek Fire Trail in accordance with the themes they represent.

Table 78 Overview of significance rankings for heritage items at Nungar Creek Fire Trail.

Pastoral items	General Ranking	Archaeological Ranking	Comments
NSU3/H1	Moderate	Moderate	NSU3/H1 is the site of an unnamed hut with no surface evidence of the presumed former structure. The archaeological potential is unclear. The hut has moderate contributory local significance within the context of the broader pastoral landscape – that significance is largely dependent upon the presence/nature of archaeological deposits.
NSU3/H2	Little	Negligible	NSU3/H2 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
NSU4/H1	Little	Negligible	NSU4/H1 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.

8.2.8 Tantangara Dam Fire Trail

The potential heritage items recorded at the Tantangara Dam Fire Trail survey area comprise items relating to pastoralism. A significance assessment of the Tantangara Dam Fire Trail historical heritage items is presented in the tables below.

Table 79 Overview of significance assessment for Tantangara Dam Fire Trail.

Pastoral Items	TFTSU3/H1 & TFTSU4/H1 - These items are the remains of stock fences.
Criterion	Assessment
a	There are no known historical associations for these features. While the items relate to twentieth century, and possibly late nineteenth century pastoral activities, they cannot be identified as important pastoral components. These items are assessed as not having significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	The items recorded in this group comprise the remains of two fence lines. While recording of these features would contribute to an overall archive of summer grazing and fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains.
f	The pastoral items within the Tantangara Dam Fire Trail survey area comprise remnants of common elements of the pastoral landscape. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. As such, the items do not meet any of the heritage criteria. They do however form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.
Miscellaneous Item	TFTSU3/H2 - This item is metal debris.
Criterion	Assessment
a	The historical associations for this item is unclear. However, there is nothing to suggest that it is of itself important in the course or pattern of NSW's (or the local area's) cultural or natural history.
b	The item has no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or natural history.
c	The item does not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The item does not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).

e	There are no identified potential archaeological deposits associated with the item, and the item is difficult to interpret. The research potential at this item is negligible. It does not have significance against this criterion.
f	Items such as this are not uncommon or rare at either a local or state level.
g	Given that the provenance and function of the item is unclear, the item cannot be considered important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	This item has no known, or identifiable important historical or social associations. It does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Tantangara Dam Fire Trail in accordance with the themes they represent.

Table 80 Overview of significance rankings for heritage items at Tantangara Dam Fire Trail.

Pastoral items	General Ranking	Archaeological Ranking	Comments
TFTSU3/H1	Little	Negligible	TFTSU3/H1 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
TFTSU4/H1	Little	Negligible	TFTSU4/H1 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
TFTSU3/H2	Negligible	Negligible	GSU3/H2 is metal debris with no predicted associated archaeological deposit. The historical context of the item is unclear. It has little negligible contributory significance.

8.2.9 Tantangara Dam

The historic items recorded at Tantangara Dam relate to the themes of transport, SMA activities including the construction of Tantangara Dam. In addition, numerous old sections of stock fences and a hut site relating to the theme of pastoralism are present. A significance assessment of the Tantangara Dam survey area historic heritage items is presented in the tables below.

Table 81 Overview of significance assessment for historic items at Tantangara Dam.

Pastoral Items	E2, E3, E6, E9, E19, TSU14/H3, TSU15/H2, TSU14/H1 (Sanko Smiths Hut) and TSU15/H1 (hut platform) – These items are all old sections of stock fences and two hut sites.
Criterion	Assessment
a	These items appear to relate to early to mid-twentieth century pastoral occupation. None of these items can be identified as important pastoral components. This group of items are assessed as not having significance against this criterion.
b	The item TSU14/H1 is potentially associated with Sank Smith. However, Smith is not identified as a person of particular importance within the local area. The other recorded items associated with pastoralism have no known or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. This group of items are assessed as not having significance against this criterion.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. They do however contribute to the broader pastoral landscape, and as such have local contributory significance against this criterion.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	Most of the items recorded in this group are fence lines, or remnants thereof. While recording of these features would contribute to an overall archive of fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains. However, TSU14/H1 and TSU15/H1 include features with identified potential for relatively intact archaeological deposits that would potentially provide information relating to the phasing, duration and nature of twentieth century pastoral occupation. Such information would potentially contribute to an understanding of the later phases of pastoral use prior to the formation of the KNP.
f	The pastoral items within the Tantangara Dam survey area comprise fence lines and hut platforms. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	Most of these items have no known, or identifiable, important historical or social associations. The only exception is TSU14/H1 and TSU15/H1. However, there is insufficient historical information regarding these items to assess whether or not they meet criterion b. Further investigation is required in order to fully assess the significance of TSU14/H1 and TSU15/H1 against this criterion. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Most of the pastoral items in this survey area are not associated with potential archaeological deposits. However, TSU14/H1 and TSU15/H1 do include areas of potential archaeological deposit. Even though the hut platforms show some signs of disturbance, it is likely that portions of relatively intact archaeological deposits remain in and around the platforms. Excavation of these two items

	is likely to yield information which would contribute to an understanding of early to mid-twentieth century pastoral occupation in the Snowy Mountains, which would contribute more broadly to an understanding of the patterns of settlement and land use in the Australian Alps. In summary, the items TSU14/H1 and TSU15/H1 are assessed as having local significance against criterion e. All the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context against criterion c, e and g.
SMA Items	E4, E5, E11, E13, E18 (twentieth century artefacts, buried machinery, wire rope, survey marker and trig station), Tantangara Dam Airstrip (under water), Tantangara Dam Survey Camp (underwater), Tantangara Intake Structure (in use), Tantangara Dam House (removed), Tantangara Dam (in use), Weather Station (in use), and Quarry.
Criterion	Assessment
a	The items are all associated with the activities of the SMA during the construction of Tantangara Dam, a significant component of the Snowy Scheme that is important in the course or pattern of NSW's cultural history. This group of items, particularly those that are extant above the water line, are assessed as having local significance against this criterion and they contribute to the broader national significance of the Snowy Mountains Scheme.
b	While the items are all associated to some extent with the work undertaken by people employed by SMA, there are no known, or identifiable special associations between these items and the SMA workers. These items have local contributory significance against this criterion.
c	The items do not generally demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area). However, the Tantangara Dam is a landmark feature that dominates the surrounding landscape and has local significance against this criterion.
d	The items do not have any known strong or special association with a particular community or cultural group.
e	Most of the identified SMA items (e.g. items underwater, survey marker/trig station, quarry, Tantangara Intake Station, Tantangara Dam, Weather Station etc). As a whole, the SMA items recorded at Tantangara Dam do not have significant potential to yield information that will contribute anything new to an understanding of the SMA. However, the artefacts identified at E4 and the site of the former Tantangara Dam House have low to moderate potential for subsurface deposits that may yield information relating to the construction of the dam and life at the caretaker's house. As a group, the items are assessed to have local contributory significance and/or potential local significance against this criterion.
f	Infrastructure associated with the SMA is relatively common across KNP and such sites are not endangered. The SMA items recorded at Tantangara are assessed as not having significance against this criterion.
g	This group of items collectively represent a range of activities associated with the construction of Tantangara Dam. They have local contributory significance at a minimum against this criterion within the context of the broader SMA landscape. The Tantangara Dam is also a good example of valley damming undertaken for the Snowy Mountains Scheme, and as such has local significance against this criterion.
Statement of Significance	These items were constructed/used by the SMA during the construction of Tantangara Dam, a significant component of the Snowy Scheme. Many of these items are in use and some are now under the Tantangara Dam water.

	While most of them are not significant features of themselves, they nevertheless form part of a broader landscape of features relating to the SMA and have contributory significance in that context. This group of items has local contributory significance against criteria a, b, c, e and g. E1 and the site of the former Tantangara Dam House also have potential local significance against criterion e in their own right. The Tantangara Dam itself is a landmark feature that is representative of SMA dams and as such has local significance against criteria c and g.
Mining Items	E7, E8, E10, E12, E15, E16, E17 and E21 - mine shaft and costeans
Criterion	Assessment
a	While these items form part of the broader mining landscape of Kiandra, the mine shaft and costeans themselves are not important components in the broader history of mining at Kiandra. These items are assessed as not having significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or cultural history.
c	The mine shaft and costeans do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Although they do contribute to the broader mining landscape within the KNP.
d	The items do not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	Mine shafts and costeans are items that present limited research potential in isolation. The items have local contributory significance against this criterion in terms of potentially contributing to an understanding of the relationship between prospecting works and locations that were actively mined.
f	Mine shafts and costeans are common elements within mining landscapes. They are not rare within KNP or the broader landscape of NSW.
g	None of the identified mining features at Tantangara Dam are notable as being particularly representative of their type. However the items contribute to the broader mining landscape of Kiandra, which is a particularly good example of a gold mining landscape that evolved from the mid 1800s through until the early twentieth century.
Statement of Significance	The mine shaft and costeans have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. This group of items has local contributory significance against criteria c, e and g.
Items relating to transport	TSU14/H2 – a section of old road
Criterion	Assessment
a	The item has no known importance in the course or pattern of NSW's, or the local area's cultural or natural history.
b	The item has no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or cultural history.
c	The item does not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The item does not have strong or special association with a particular community or cultural group.

e	Portions of former road alignments are not generally recognised as items with significant archaeological research potential. Moreover, the identified portions of track show signs of disturbance that further reduce any limited research potential these three items may have.
f	Portions of former road alignments are common within the KNP. Such sites are also relatively common across the broader NSW landscape.
g	This section of old road is of uncertain age and association, it is also compromised by vegetation growth and a rabbit burrow. It is not a good example of its type.
Statement of Significance	The item has no known, or identifiable important historical or social associations. The item is a common features/site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not meet any of the heritage criteria. Nevertheless, the items form part of a broader landscape of features relating to the theme of transport and pastoralism and has contributory significance in that context.
Miscellaneous Items	E1 and E14 – dug out pond/drainage line and stacked rocks.
Criterion	Assessment
a	The items are not important in the course or pattern of NSW's cultural or natural history.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's or the local area.
c	The items do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	The items do not have strong or special association with a particular community or cultural group.
e	There are no identified potential archaeological deposits associated with these items. Furthermore, the unclear historical associations for these items mean that their potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history is negligible.
f	These items are not uncommon or rare at either a local or state level.
g	It is not clear what period of use or site type these items relate to. As such, none of them can be considered important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Tantangara Dam in accordance with the themes they represent.

Table 82 Overview of significance rankings for historic items at Tantangara Dam.

Pastoral items	General Ranking	Archaeological Ranking	Comments
E2	Negligible	Negligible	E2 is an accumulation of old fence wire with no predicted associated

			archaeological deposit. The item has negligible contributory significance within the context of the broader pastoral landscape.
E3	Little	Negligible	E3 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
E6	Little	Negligible	E6 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
E9	Negligible	Negligible	E9 is a single fence post with no predicted associated archaeological deposit. It has negligible contributory significance within the context of the broader pastoral landscape.
E19	Little	Negligible	E19 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
TSU14/H1	Moderate	Moderate to High	TSU14/H1 is the Sanko Smith (KHA) hut platform and stone hearth. The platform is predicted to have a high potential for archaeological deposits and the potential to yield information about the site age and function. The hut site has moderate to high (particularly archaeological) contributory significance.
TSU14/H3	Negligible	Negligible	TSU14/H3 is an accumulation of old fence wire with no predicted associated archaeological deposit. The item has negligible contributory significance within the context of the broader pastoral landscape.
TSU15/H1	Moderate	Moderate to High	TSU15/H1 is a platform and stone hearth. The platform is predicted to have a high potential for archaeological deposits and the potential to yield information about the site age and function. The hut site has moderate to high (particularly archaeological) contributory significance.
TSU15/H2	Little to Moderate	Negligible to Little	TSU15/H2 is an old fence line evidenced primarily by post holes and fragmentary wire; there are few remaining posts. The fence is in very poor condition. However, survey of this feature may contribute to an understanding of the pastoral landscape.

			The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
SMA items	General Ranking	Archaeological Ranking	Comments
E4	Little-Moderate	Little-Moderate	E4 comprises an extensive scatter of twentieth century items (including window glass, ceramic fragments and metal items). The site is thought to be a rubbish disposal area, associated with SMA activities, that has been disturbed by rabbits. Various artefacts are present across the surface of the site and it is predicted that additional items are present in a disturbed subsurface context. This item is assessed as having little to moderate archaeological contributory significance within the context of the broader SMA landscape.
E5	Little	Little	E5 comprises pieces of buried machinery in a rehabilitated portion of the valley – it is thought to be a former laydown area associated with construction of the Tantangara Dam. It is predicted that additional items are present in a disturbed subsurface context. This item is assessed as having little archaeological contributory significance and little overall contributory significance to the broader SMA landscape.
E11	Little	Negligible	E11 comprises two steel drums a wire rope and piece of vertical pipe that is presumed to be associated with SMA activities at Tantangara Dam. The item is difficult to interpret and is not associated with archaeological deposits. It has little contributory significance as part of the broader SMA landscape.
E13	Moderate	Negligible	E13 is a SMA survey marker. The item is in relatively good condition, but has no identifiable associated archaeological deposits. This item is not assessed as having heritage significance of itself. However, it is assessed as having moderate contributory significance as part of the broader SMA landscape.
E18	Moderate	Negligible	E18 is an SMA Trig station that is in a good condition. It has no identifiable archaeological deposits in association with it. This item is not assessed as having heritage significance of itself. However, it is assessed as having moderate contributory significance as part of the broader SMA landscape.

Tantangara Dam Airstrip (KHA 2620)	Negligible	Negligible	The Tantangara Dam Airstrip has been flooded by Tantangara Dam. As such, the site is now inaccessible and has negligible contributory significance.
Tantangara Dam Survey Camp (KHA 4855)	Negligible	Negligible	The Tantangara Dam Survey Camp has been flooded by Tantangara Dam. As such, the site is now inaccessible and has negligible contributory significance.
Tantangara Intake Structure (KHA 2604)	Moderate	NA	The Tantangara Intake Structure is a functioning component of the Snowy Mountains Scheme. The item is in good condition but has limited heritage significance in its own right. The item has moderate contributory significance within the context of the broader Snowy Mountains Scheme.
Tantangara Dam House (KHA 2603)	Little - Moderate	Moderate	The Tantangara Dam House dates to the period between 1958 and 1970, during which time it functioned as the caretaker's house. The site appears to display some archaeological potential, although the integrity and extent of deposits is unclear. Excavation of this site may yield information that would contribute to an understanding of SMA worker life at the caretaker's house. It has moderate contributory significance within the context of the broader SMA landscape.
Tantangara Dam (KHA 1270)	High	Negligible	The Tantangara Dam is a key component of the Snowy Mountains Scheme. The dam has a very strong visual presence in the landscape. It has high contributory significance within the context of the broader SMA landscape.
Weather Station (KHA 2606)	Moderate	NA	The Weather Station is a functioning component of the Snowy Mountains Scheme. The item is in good condition but has limited heritage significance in its own right. The item has moderate contributory significance within the context of the broader Snowy Mountains Scheme.
Quarry (KHA 2607)	Moderate to High	Negligible	This is a quarry/gravel pit that is not predicted to contain archaeological deposits. It is however quite representative of SMA quarries and as such has moderate to high contributory significance as part of the broader SMA landscape
Mining items	General Ranking	Archaeological Ranking	Comments
E7	Moderate	Negligible	E7 is a mine shaft that is presumably associated with the Tantangara diggings. However, further research is required into this item. The shaft has limited

			archaeological potential. The shaft has moderate contributory significance within the context of the broader mining landscape.
E8	Little	Negligible	E8 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
E10	Little	Negligible	E10 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
E12	Little	Negligible	E12 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
E15	Little	Negligible	E15 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
E16	Little	Negligible	E16 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
E17	Little	Negligible	E17 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
E21	Little	Negligible	E21 is a costean associated with the Tantangara diggings. The feature has limited archaeological potential. The costean has little contributory significance within the context of the broader mining landscape.
Item relating to transport	General Ranking	Archaeological Ranking	Comments
TSU14/H2	Little-Moderate	Negligible	TSU14/H2 is a track alignment with no predicted associated archaeological deposit. The track is in poor condition. This section of track has little-moderate contributory significance within the

			context of the broader landscape of transport related items.
Miscellaneous	General Ranking	Archaeological Ranking	Comments
E1	Little	Negligible	E1 is a dug-out pond with associated twentieth century debris. The age and function of this feature is uncertain. It has no predicted associated archaeological deposit. It has little contributory significance.
E14	Little	Negligible	E14 is a small rock stack the age and function of which is uncertain. It has no predicted associated archaeological deposit. It has little contributory significance.

8.2.10 Tantangara Road

The historic items recorded along Tantangara Road largely relate to the themes of transport and the SMA activities including the construction of Tantangara Road. In addition, numerous old sections of stock fences relating to the theme of pastoralism are present. A significance assessment of the Tantangara Road historic heritage items is presented in the tables below.

Table 83 Overview of significance assessment for historic items at Tantangara Road.

Pastoral Items	E29, E30, E36, E39, E47, E48 and E53 – These items are all old sections of stock fences.
Criterion	Assessment
a	There are no known historical associations for any of these features. While the items relate to twentieth century, and possibly late nineteenth century pastoral activities, they cannot be identified as important pastoral components. The items are assessed as not having significance against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. They do however contribute to the broader pastoral landscape, and as such have local contributory significance against this criterion.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	The items recorded in this group are fence lines, or remnants thereof. While recording of these features would contribute to an overall archive of fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains.
f	The pastoral items within the Tantangara Road survey area comprise remnants of common elements of the pastoral landscape. None of these features are uncommon or rare within KNP or the broader landscape of NSW.

g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable, important historical or social associations. The items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The pastoral items in this survey area are not associated with potential archaeological deposits. In summary, all the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context against criteria c, e and g.
SMA Items	E31 (hard rock quarry), Tantangara Works Centre (E37, E38, E40, E41, E42, E43, E44), E45 (hard rock quarry), E46, E55 (old SMA roads) and E56 (Gang Gang Creek Camp) – These items are all related to the SMA and include the Tantangara Works Centre at the Tantangara village site on Tantangara Road
Criterion	Assessment
a	The items are all associated with the activities of the SMA during the construction of Tantangara Dam, a significant component of the Snowy Scheme that is important in the course or pattern of NSW's cultural history. The items include key components of the infrastructure associated with construction of the Tantangara Dam such as the hard rock quarries, road alignments and the site of accommodation for SMA workers. This group of items is assessed as having local significance against this criterion; they also contribute to the broader national significance of the Snowy Mountains Scheme.
b	While the items are all associated to some extent with the work undertaken by people employed by SMA, there are no known, or identifiable special associations between these items and the SMA.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Nevertheless, the workshop area and quarry in particular do form part of a broader SMA landscape that is noted in terms of technical engineering achievements at a national level. These items are assessed as having local contributory significance against this criterion.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	The stone quarry items are not associated with any identifiable archaeological deposits. However, the Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang Creek Camp (E56) are likely to contain at least some areas of relatively intact archaeological deposits. These items may have potential to yield information that will contribute to an understanding of the logistics, accommodation and living conditions for SMA workers. The Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang Creek Camp (E56) are assessed as having local significance against this criterion.
f	SMA quarries and camp sites are relatively common features in the KNP, and similar items are common across NSW. These items are assessed as not having significance against this criterion.
g	This group of items collectively represent a range of activities associated with the construction of Tantangara Dam. They have local contributory significance at a minimum against this criterion within the context of the

	broader SMA landscape. The quarries (E31 and E45), Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang Creek Camp (E56) are also assessed as having local significance against this criterion as good examples of their respective SMA site types.
Statement of Significance	These items were constructed/used by the SMA during the construction of Tantangara Dam, a significant component of the Snowy Scheme. The items include key components of the infrastructure associated with construction of the Tantangara Dam such as the hard rock quarries, road alignments and the site of accommodation for SMA workers. While the items are generally not notable in terms of aesthetic characteristics, they do form part of a broader SMA landscape that is noted in terms of technical engineering achievements at a national level. The Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang Creek Camp (E56) are likely to contain at least some areas of relatively intact archaeological deposits. These items may have potential to yield information that will contribute to an understanding of the logistics, accommodation and living conditions for SMA workers. This group of items has local contributory significance against criteria a, b, c, e and g. The Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang Creek Camp (E56) also have local significance against criteria e and g. The quarries (E31 and E45) have also been assessed to have local significance against criteria g.
Mining Items	E50 and E52 – These items include areas of worked ground.
Criterion	Assessment
a	While these items form part of the broader mining landscape of Kiandra, the workings themselves are not important components in the broader history of mining at Kiandra. These items are assessed as not having significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of local or state importance.
c	While these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of a broader mining landscape that has landmark qualities.
d	The items do not have any known strong or special association with a particular community or cultural group.
e	Areas of worked ground are items that present limited research potential in isolation. The items have local contributory significance against this criterion in terms of potentially contributing to an understanding of the relationship between prospecting works and locations that were actively mined.
f	Mining features are common across the Kiandra landscape, the broader KNP landscape and NSW as a whole. This group of items does not have local or state significance against this criterion.
g	While this group of items comprises features typically associated with gold mining, none of these items are notable in terms of their representativeness. Nevertheless, they contribute to the broader Kiandra landscape, which is important in demonstrating mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. As such, these items have local contributory significance as against this criterion.
Statement of Significance	These two areas of worked ground have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic

	characteristics or a high degree of technical/creative achievement. This group of items has local contributory significance against criteria c, e and g.
Items relating to transport	E22, E23, E24, E25, E26, E27, E28, E32, E33, E34, E35, E49 and E54– vestige remnants of various roads, including old SMA roads and stone culverts.
Criterion	Assessment
a	While the road remains that are present within the survey area are not generally identifiable with important events or patterns in local or state history, they are part of a larger complex of features that are important in the theme of the development of transport and communication in the Snowy Mountains and some of them appear to be associated with SMA activities. As such this group of items is assessed as having local contributory significance against this criterion.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW or the local area.
c	The items do not generally demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. They do however contribute to the broader landscape of transport and communication in KNP.
d	The items do not have strong or special association with a particular community or cultural group.
e	This group of remnant roads and culverts appears to primarily relate to twentieth century transport routes. Such features have limited potential to yield information that will significantly contribute to an understanding of the history of the local area. However, further research into these items and detailed survey of the features and their broader landscape setting may contribute to an understanding of the evolution of different transport routes in the Snowy Mountains. As such this group of items is assessed as not having significance against this criterion.
f	Portions of former road alignments and culverts are not uncommon within the KNP. Such sites are also relatively common across the broader NSW landscape. As such, this group of items is assessed as not having local significance against this criterion.
g	None of the identified transport related items along Tantangara Road are identifiable as particularly good examples of their type. They do however contribute to the broader landscape of transport related items across the Snowy Mountains.
Statement of Significance	The items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the items do not meet any of the heritage criteria in their own right. Nevertheless, the items form part of a broader landscape of features relating to the theme of transport and have contributory significance in that context against criteria a, c, e and g.
Miscellaneous Items	E2 and E51 - The items include minor earth works of unknown function and age.
Criterion	Assessment
a	The items are not important in the course or pattern of NSW's cultural or natural history.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW or the local area.

c	The items do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	The items do not have strong or special association with a particular community or cultural group.
e	There are no identified potential archaeological deposits associated with these items. Furthermore, the unclear historical associations for these items mean that their potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history is negligible.
f	These items are not uncommon or rare at either a local or state level.
g	It is not clear what period of use or site type these items relate to. As such, none of them can be considered important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Nungar Creek Trail in accordance with the themes they represent.

Table 84 Overview of significance rankings for historic items at Tantangara Road.

Pastoral items	General Ranking	Archaeological Ranking	Comments
E29	Little	Negligible	E29 is an old fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
E30	Little	Negligible	E30 is a single strainer post. There are no predicted associated archaeological deposits in this location. The post has little contributory significance within the context of the broader pastoral landscape.
E36	Little	Negligible	E36 is a remnant fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
E39	Little	Negligible	E39 is a remnant fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.

E47	Little	Negligible	E47 is a remnant fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little contributory significance within the context of the broader pastoral landscape.
E48	Little	Negligible	E48 is a remnant portion of fence line in poor condition. Furthermore, there are no predicted associated archaeological deposits in this location. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
E53	Little-Moderate	Negligible	E53 is a 100m section of an old fence line that is in relatively good condition. There are no predicted associated archaeological deposits in this location. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
E50	Little-moderate	Negligible	E50 is an area of excavation that appears to be mine workings. However, its age and function are uncertain. The condition of this feature is good, but potential for archaeological investigations is limited. The item has little to moderate contributory significance within the context of the broader mining landscape.
E52	Little-moderate	Negligible	E52 is an area of excavation that appears to be mine workings. However, its age and function are uncertain. The condition of this feature is good, but potential for archaeological investigations is limited. The item has little to moderate contributory significance within the context of the broader mining landscape.
SMA Items	General Ranking	Archaeological Ranking	Comments
E31	High	Negligible	E31 is a stone quarry that is not predicted to contain archaeological deposits. It is however representative of SMA hard rock quarries and as such has high contributory significance as part of the broader SMA landscape.
E37	Moderate	Little	E37 is a mechanically levelled area of uncertain function and an element of the Tantangara Works Centre that is not associated with identifiable

			potential archaeological deposits. This item assessed as having moderate contributory significance as part of the broader SMA landscape.
E38	Moderate	Little	E38 is a mechanically levelled area of uncertain function and an element of the Tantangara Works Centre that is not associated with identifiable potential archaeological deposits. This item assessed as having moderate contributory significance as part of the broader SMA landscape.
E40	Moderate	Little-Moderate	E38 is an excavated rectilinear pit with wooden reinforcing. It is of uncertain function. It is an element of the Tantangara Works Centre that displays archaeological potential. This item is assessed as having moderate contributory significance as part of the broader SMA landscape.
E41	Moderate	Little-Moderate	E41 is an old section of road and an element of the Tantangara Works Centre. It includes areas with potential archaeological deposits of uncertain integrity. This item is assessed as having moderate contributory significance as part of the broader SMA landscape.
E42	Moderate	Moderate-High	E42 is series of terraces and platforms and an element of the Tantangara Works Centre that includes areas with potential archaeological deposits, some of which are likely to be relatively intact. of uncertain integrity. This item is assessed as having moderate-high (particularly archaeological) contributory significance as part of the broader SMA landscape.
E43	Moderate	Moderate-High	E43 is a terraced area with visible terracotta pipework and is an element of the Tantangara Works Centre that includes areas with potential archaeological deposits, some of which are likely to be relatively intact. of uncertain integrity. This item is assessed as having moderate-high (particularly archaeological) contributory significance as part of the broader SMA landscape.
E44	Moderate	Negligible	E44 is a section of old road alignment at the Tantangara Works Centre that does not have potential archaeological deposits. This item is assessed as having moderate contributory

			significance as part of the broader SMA landscape.
E45	High	Negligible	E45 is a stone quarry that is not predicted to contain archaeological deposits. It is however representative of SMA hard rock quarries and as such has high contributory significance as part of the broader SMA landscape.
E46	Moderate	Negligible	E46 is a section of old road alignment that does not have potential archaeological deposits. This item is assessed as not having heritage significance of itself. However, it is assessed as having moderate contributory significance as part of the broader SMA landscape.
E55	Moderate	Negligible	E55 is a section of old road alignment that does not have potential archaeological deposits. This item is assessed as not having heritage significance of itself. However, it is assessed as having moderate contributory significance as part of the broader SMA landscape.
E56	Moderate	Moderate-High	E56 is the SMA Gang Gang Camp. It is likely to have archaeological deposits in association with it, and these are likely to be relatively intact. The site has the potential to address research questions relating to accommodation and living conditions for SMA workers. This item is assessed as having moderate to high contributory significance (particularly archaeological) as part of the broader SMA landscape.
Items relating to transport	General Ranking	Archaeological Ranking	Comments
E22, E23, E24, E25, E26, E27, E28, E32, E33, E34, E35, E49, E54	Moderate	Negligible	These items are stone culverts and old road alignments with no predicted associated archaeological deposit. There is some variability in the stone culverts which may be indicative of different periods of construction and it is likely that some were built by the SMA. These items have moderate contributory significance relating to transport within the context of the broader landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
E51	Negligible	Negligible	E51 is a scalped area of uncertain function with no predicted associated archaeological deposit. The historical context of the item is unclear. It has

			little negligible contributory significance.
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8.2.11 Nungar Creek Trail

The potential heritage items recorded at the eastern end of the Nungar Creek Trail survey area largely relate to pastoralism and include the Boggy Plain Hut Complex and old fence lines. In addition, vestiges of the old Kiandra – Tantangara track dated to the mid-1800s and considerable gold mining features are present at the west end of the area nearer to Kiandra. A significance assessment of the Nungar Creek Trail historical heritage items is presented in the tables below.

Table 85 Overview of significance assessment for historic items at Nungar Creek Trail.

Pastoral Items	NCTSU2/H1, NCTSU2/H2, NCTSU9/H1, NCTSU16/H2, NCTSU23/H7 - The items include the Boggy Plain Hut Complex and old fences.
Criterion	Assessment
a	These items appear to relate to early to mid-twentieth century pastoral occupation. There are no known important historical associations. The item NCTSU2/H1 is not important in the course or pattern of NSW's cultural or natural history.
b	The items NCTSU2/H1 and NCTSU2/H2 are potentially associated with WV Schiller, who held a lease on Boggy Plain in the 1920s. However, Schiller is not identified as a person of particular importance within the local area. The other recorded items associated with pastoralism have no known or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	None of the items demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	None of the items have any known strong or special associations with a particular community or cultural group in NSW or the local area.
e	Most of the items recorded in this group are fence lines, or remnants thereof. While recording of these features would contribute to an overall archive of fencing types and associated chronologies, their research potential is primarily at a contributory level across the broader landscape of the Snowy Mountains. However, the complex of items at NCTSU2/H1 includes features with identified potential for relatively intact archaeological deposits that would potentially provide information relating to the phasing, duration and nature of twentieth century pastoral occupation. Such information would potentially contribute to an understanding of the later phases of pastoral use prior to the formation of the KNP.
f	The pastoral items within the Nungar Creek Trail survey area comprise fence lines and a complex of features at the site of an early to mid-twentieth century pastoral hut. None of these features are uncommon or rare within KNP or the broader landscape of NSW.
g	None of the pastoral items in this group are particularly representative or well-preserved examples of their type. None have been identified as important in demonstrating the principal characteristics of a class of

	NSW's (or the local area's) cultural or natural places or cultural or natural environments.
Statement of Significance	<p>Most of these items have no known, or identifiable, important historical or social associations. The only exception is NCTSU2/H1, the Boggy Plains Hut complex. However, there is insufficient historical information regarding this item to assess whether or not it meets criterion a. Further investigation is required in order to fully assess NCTSU2/H1's significance against this criterion. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Most of the pastoral items in this survey area are not associated with potential archaeological deposits. However, the complex of features at NCTSU2/H1 does include areas of potential archaeological deposit. Even though the main hut platform shows signs of disturbance, it is likely that portions of relatively intact archaeological deposits remain in and around the platform and across the various depressions/well identified in association with the building platform. Excavation at this complex is likely to yield information which would contribute to an understanding of early to mid-twentieth century pastoral occupation in the Snowy Mountains, which would contribute more broadly to an understanding of the patterns of settlement and land use in the Australian Alps.</p> <p>In summary, the item NCTSU2/H1 is assessed as having local significance against criterion e and potentially having local significance against criterion a. All the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.</p>
Mining Items	NCTSU23/H1, NCTSU23/H2, NCTSU23/H3, NCTSU23/H5, NCTSU23/H6 and NCTSU24/H1 – These items include sections of water races, a costean, and areas of heavily worked/mined gully (sluicing) and areas of multi-phased surface workings.
Criterion	Assessment
a	This complex of mine workings form part of the broader mining landscape of Kiandra. Further research is required into associated mine records in order to fully assess these items in terms of their importance in the course or pattern of NSW's (or the local area's) cultural or natural history. However, these items have good potential to be important at a local level against this criterion.
b	These items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. Further research into associated mine records is necessary in order to fully assess these items against this criterion.
c	While these items do not of themselves demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement, they form part of a broader mining landscape that has landmark qualities.
d	These items do not have any known strong or special association with a particular community or cultural group.
e	These items form part of a broader landscape that has demonstrated potential to yield information that will contribute to an understanding of nineteenth and early twentieth century mining in the Snowy Mountains. Detailed survey and/or excavation of these features (e.g. trenches across mining features such as water races) has the potential

	to yield information that will contribute to an understanding of the engineering and phasing of mining in the local area.
f	Mining features are common across the Kiandra landscape, the broader KNP landscape and NSW as a whole. This group of items do not have local or state significance against this criterion.
g	While this group of items comprises a set of features typical of different aspects of alluvial mining (prospecting, water management, surface workings and ground sluicing), none of these items are notable in terms of their representativeness. Nevertheless, they contribute to the broader Kiandra landscape, which is important in demonstrating mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. The Kiandra landscape is also arguably of importance at a state level as an example of diverse complex of alluvial mining dating back to the mid-nineteenth century. As such, these items have contributory significance as part of a landscape that has local, if not state significance against this criterion.
Statement of Significance	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criteria c and g, and local significance against criterion e due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Items relating to transport	NCTSU16/H1, NCTSU22/H1 and NCTSU23/H4 – vestige remnants of the old Kiandra – Tantangara track dated to the mid-1800s
Criterion	Assessment
a	The three items comprise portions of the former Old Kiandra – Tantangara Track, which dates back to the mid-nineteenth century. This track formed part of the transport network between early pastoral stations, towns and the gold fields. While the portions of this track that are present within the survey area are not clearly identifiable with important events or patterns in local or state history, they are part of a larger feature that is important in the theme of the development of transport and communication in the Snowy Mountains.
b	The portions of the former Old Kiandra – Tantangara Track have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history. However, it is recognised that potential for such associations exist and may be revealed through additional research.
c	These items do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.
d	These items do not have strong or special association with a particular community or cultural group.
e	Portions of former nineteenth century road alignments are not generally recognised as items with significant archaeological research potential. Moreover, the identified portions of track show signs of disturbance that further reduce any limited research potential these three items may have.
f	Portions of former road alignments from the nineteenth century are not uncommon within the KNP. Such sites are also relatively common across the broader NSW landscape.

g	The portion of the former Old Kiandra – Tantangara Track recorded within this survey area are partially disturbed by erosion and subsequent phases of road formation and maintenance. As such, these three items are not representative components of the track to which they relate, or the broader class of nineteenth century tracks within the KNP.
Statement of Significance	The items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria. Nevertheless, these items form part of a broader landscape of features relating to the theme of transport and pastoralism and have contributory local significance in that context.
Miscellaneous Items	NCTSU4/H1 and NCTSU24/H2 - The items include an excavated depression and a post, both of unknown function and age.
Criterion	Assessment
a	The historical associations for these items are unclear. The items may relate to broader themes of pastoralism mining and/or transport. However, they are not of themselves important in the course or pattern of NSW's (or the local area's) cultural or natural history.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or natural history.
c	The items do not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The items do not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	There are no identified potential archaeological deposits associated with these two items. Furthermore, the unclear historical associations for these items mean that their potential to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history is negligible.
f	Fence posts and depressions are very common features across the KNP. Neither of these items are uncommon or rare at either a local or state level.
g	It is not clear what period of use or site type these two items relate to. As such, neither of them can be considered important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

The following table presents a significance ranking of each potential historic item at Nungar Creek Trail in accordance with the themes they represent.

Table 86 Overview of significance rankings for historic items at Nungar Creek Trail.

Pastoral items	General Ranking	Archaeological Ranking	Comments
NCTSU2/H1	Moderate	Moderate-High	NCTSU2/H1 is the Boggy Plains Hut complex comprising the burnt ruin of a hut and associated debris and a nearby depression, believed to possibly be a well. The complex is predicted to possess associated archaeological deposit and has the potential to yield information about the site's function and phases of use. This item has moderate to high contributory significance, particularly in terms of its archaeological potential.
NCTSU2/H2	Little-Moderate	n/a	NCTSU2/H2 comprises the remnants of a stock fence with no predicted associated archaeological deposit. The fence is in poor condition, although the original alignment is still discernible. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
NCTSU9/H1	Little	n/a	NCTSU9/H1 is a stock fence with no predicted associated archaeological deposit. The fence is in very poor condition. The fence has little contributory significance within the context of the broader pastoral landscape.
NCTSU16/H2	Little-Moderate	n/a	NCTSU16/H2 is a stock fence with no predicted associated archaeological deposit. The fence is in poor condition but nevertheless remains as a relatively strong visual presence in the landscape. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
NCTSU23/H7	Little-Moderate	n/a	NCTSU23/H7 is a stock fence with no predicted associated archaeological deposit. The fence is in poor condition. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
NCTSU23/H1	Moderate	Little-Moderate	NCTSU23/H1 is a water race associated with Kiandra gold mining. It is in poor condition and does not have a strong visual presence in the landscape. The feature has limited archaeological potential. The race has moderate contributory significance within the context of the broader mining landscape.

NCTSU23/H2	Moderate	Little-Moderate	NCTSU23/H2 is a water race associated with Kiandra gold mining. It is in poor condition and does not have a strong visual presence in the landscape. The feature has limited archaeological potential. The race has moderate contributory significance within the context of the broader mining landscape.
NCTSU23/H3	Moderate	Little	NCTSU23/H3 is a costean associated with Kiandra gold mining. It does not have a strong visual presence in the landscape. It has no very limited archaeological potential. This feature has little to moderate contributory significance within the context of the broader pastoral landscape.
NCTSU23/H5	Moderate	Moderate	NCTSU23/H5 comprises components of mine workings that are part of the broader mining landscape at Kiandra; it has a relatively strong visual presence in the landscape. While the potential for archaeological deposits is limited, the surface features are relatively intact and present the potential to yield information relating to mining phases and types. This item has moderate contributory significance within the context of the broader mining landscape.
NCTSU23/H6	Moderate	Moderate	NCTSU23/H6 comprises components of mine workings that are part of the broader mining landscape at Kiandra; it has a relatively strong visual presence in the landscape. While the potential for archaeological deposits is limited, the surface features are relatively intact and present the potential to yield information relating to mining phases and types. This item has moderate contributory significance within the context of the broader mining landscape.
NCTSU24/H1	Moderate	Moderate	NCTSU24/H1 comprises components of mine workings that are part of the broader mining landscape at Kiandra; it has a relatively strong visual presence in the landscape. While the potential for archaeological deposits is limited, the surface features are relatively intact and present the potential to yield information relating to mining phases and types. This item has moderate contributory significance within the context of the broader mining landscape.

Items relating to transport	General Ranking	Archaeological Ranking	Comments
NCTSU16/H1	Little-Moderate	Little	NCTSU16/H1 is a portion of an historical track alignment with very limited archaeological research potential. archaeological deposit. The track is in very poor condition. This section of track has little-moderate contributory significance relating to transport within the context of the broader pastoral and mining landscape.
NCTSU22/H1	Little-Moderate	Little	NCTSU22/H1 is a historic track alignment with no predicted associated archaeological deposit. The track is in very poor condition. This section of track has little-moderate contributory significance relating to transport within the context of the broader pastoral and mining landscape.
NCTSU23/H4	Little-Moderate	Little	NCTSU23/H4 is a historic track alignment with no predicted associated archaeological deposit. The track is in very poor condition. This section of track has little-moderate contributory significance relating to transport within the context of the broader pastoral and mining landscape.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
NCTSU4/H1	Negligible	n/a	NCTSU4/H1 is an amorphous depression of unclear function/origin. It has no predicted associated archaeological deposit. It has negligible contributory significance.
NCTSU24/H2	Negligible	n/a	NCTSU24/H2 is a vertical post of unknown function and age. It has no predicted associated archaeological deposit. It has negligible contributory significance.

8.2.12 Rock Forest

The heritage items recorded at Rock Forest largely relate to pastoralism and agriculture and include old fence lines and notably an old cultivation paddock, the ridges and furrows of which are clearly discernible on the ground and in aerial imagery. A significance assessment of the Rock Forest historical heritage items is presented in the tables below.

Table 87 Overview of significance assessment for historic items at Rock Forest.

Pastoral Items	CCSU1/H1; CCSU1/H2; CCSU1/H3; CCSU1/H4 and CCSU1/H5 The items include amorphous ground disturbance areas, fences and horse drawn bucket scoop.
Criterion	Assessment
a	The historical associations for these items are unclear. While the items are likely to relate to the broader landscape of pastoral activities, they are not of themselves important in the course or pattern of NSW's (or the local area's) cultural or natural history.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or cultural history.
c	The items do not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The items do not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	There are no potential archaeological deposits associated with these items. Furthermore, the extant remains offer very limited research potential with regard to informing an understanding of the history of local pastoralism.
f	Fence lines, surface modifications and moveable items associated with pastoralism are not rare within either the KNP landscape of the broader NSW landscape.
g	The identified items are in poor to fair condition. They are not particularly good examples of their type at either local or state levels.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria. Nevertheless, the items all form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.
Agricultural Items	CCSU9/H1; This item is an old cultivation paddock.
Criterion	Assessment
a	The historical associations for this item are unclear. While the item forms part of the broader history of agriculture in the local area, it is not of itself important in the course or pattern of the cultural or natural history of NSW or the local area.
b	The item has no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or natural history.
c	The item does not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The item does not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	The ridge and furrows across the cultivation paddock are still clearly discernible. Surface survey and/or archaeological trenches across portions of the paddock may yield information relating to the size, type and technique of plough utilised. Such information would contribute to

	an understanding of agriculture practised in the Snowy Mountains prior to the formation of the KNP.
f	Extant ploughed/cultivation fields dating to the 1800s and early 1900s are an increasingly rare site type. Such sites are not common within the KNP. This item is assessed to be a locally rare site type.
g	This item is a fair example of a ridge and furrow cultivation paddock. Given that such items are not common within the KNP, this item has local importance in terms of demonstrating such a site type.
Statement of Significance	This item is a relatively uncommon site type within the KNP that demonstrates aspects of the cultivation practised prior to formation of the National Park. Research potential exists at this site in relation to ascertaining and documenting the size, type and technique of ploughing utilised, which may in turn inform chronology of site use and/or types of cultivation practised. The cultivation paddock has local significance in terms of its research potential, rarity and representativeness; it meets the heritage criteria at a local level against criteria e, f and g.
Mining Items	CCSU3/H1; This item is a costean.
Criterion	Assessment
a	The historical associations for this item are unclear. While the item forms part of the broader history of mining in the local area, it is not of itself important in the course or pattern of the cultural or natural history of NSW or the local area.
b	The item has no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local area's) cultural or natural history.
c	The item does not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The item does not have strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reason.
e	The item has minimal potential for associated archaeological deposits. Further investigation of this item is unlikely to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history.
f	Costeans are a common feature in mining landscapes. They are not rare at either the local or state level. The item does not possess uncommon, rare or endangered aspects of NSW's (or the local area's) cultural or natural history.
g	While this item is typical in size and form for a nineteenth to early twentieth century costean, it is not considered to be a representative example of its type.
Statement of Significance	The item has no known, or identifiable important historical or social associations. It comprises a common feature/site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not fulfil the criteria for listing at either a local or State level. Nevertheless, the costean forms part of a broader landscape of mining and has contributory significance in that context.
Miscellaneous Items	CCSU1/H6; CCSU1/H7 and CCSU8/H1 The items include collections of materials.
Criterion	Assessment
a	The historical associations for these items are unclear. While the items are likely to relate to the broader landscape of pastoral and mining

	activities, they are not of themselves important in the course or pattern of the cultural or natural history of NSW or the local area.
b	The items have no known, or identifiable special associations with the life or works of a person, or groups of persons of importance in NSW's (or the local areas) cultural or cultural history.
c	The items do not demonstrate aesthetic characteristics or a high degree of technical/creative achievement in NSW (or the local area).
d	The items do not have strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reason (or the local area).
e	The items are not associated with potential archaeological deposits. Further investigation of these items is unlikely to yield information that will contribute to an understanding of NSW's (or the local area's) cultural or natural history.
f	None of the recorded items are uncommon or rare at either local or state levels.
g	The items are not important in demonstrating the principal characteristics of a class of NSW's cultural or natural places or cultural or natural environments.
Statement of Significance	These items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not fulfil the criteria for listing at either a local or State level.

The following table presents a significance ranking of each potential historic item at Rock Forest in accordance with the themes they represent.

Table 88 Overview of significance rankings for pastoral items at Rock Forest.

Pastoral items	General Ranking	Archaeological Ranking	Comments
CCSU1/H1	Little	Little	CCSU1/H1 is a pit (function unknown) with no predicted associated archaeological deposit. The pit has no known historic associations and the theme to which it relates is uncertain. It has little contributory significance.
CCSU1/H2	Little	Little	CCSU1/H2 is an excavation (function unknown) with no predicted associated archaeological deposit. The excavation has no known historic associations and the theme to which it relates is uncertain. It has little contributory significance.
CCSU1/H3	Little - Moderate	n/a	CCSU1/H3 is a stock fence with no predicted associated archaeological deposit. The fence is in poor condition and includes various phases of modifications, although the

			original alignment is still clearly discernible. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
CCSU1/H4	Little - Moderate	n/a	CCSU1/H4 a rabbit mesh stock fence with no predicted associated archaeological deposit. The fence is functional and in moderate condition; although it also includes modifications. The fence has little to moderate contributory significance within the context of the broader pastoral landscape.
CCSU1/H5	Little - Moderate	n/a	CCSU1/H5 is a horse-drawn bucket scoop with no predicted associated archaeological deposit. Such items have been superseded by tractors and other forms of mechanical equipment. It evokes a time when farm work was undertaken with the assistance of work horses. The bucket scoop has little to moderate contributory significance within the context of the broader pastoral landscape.
Agricultural items	General Ranking	Archaeological Ranking	Comments
CCSU9/H1	Moderate	n/a	CCSU9/H1 is an old cultivation paddock with no predicted associated archaeological deposit. The item is in moderate condition and the original alignment of the furrows and ridges are still discernible. Detailed mapping may yield information about the ploughing techniques used, which could in turn date the last phase of cultivation and/or inform the type of cultivation practised. The item has moderate contributory significance within the context of the broader pastoral landscape.
Mining items	General Ranking	Archaeological Ranking	Comments
CCSU3/H1	Little	n/a	CCSU3/H1 is likely to be a costean. It has no known historic context and no predicted associated archaeological deposit. It has little contributory significance.
Miscellaneous items	General Ranking	Archaeological Ranking	Comments
CCSU1/H6	Negligible	n/a	CCSU1/H6 is a collection of wood material with no predicted associated archaeological deposit.

			The item has no known context or historic associations. It has little negligible contributory significance.
CCSU1/H7	Negligible	n/a	CCSU1/H7 is an iron pipe with no predicted associated archaeological deposit. The item has no known context or historic associations. It has little negligible contributory significance.
CCSU8/H1	Negligible	n/a	CCSU8/H1 comprises pieces of machinery with no known historical associations and no predicted archaeological deposits associated. It has little negligible contributory significance.

9. IMPACT ASSESSMENT

9.1 OVERVIEW OF IMPACTS

Snowy 2.0 will link the existing Tantangara and Talbingo Reservoirs within the present Snowy Scheme through a series of new underground tunnels and construction of a new underground hydro-electric power station. Most of the project's facilities will be underground. The assessment presented in this Section is concerned with above ground construction impacts only.

The key areas of construction are shown in Section 2 in Figures 3 – 9 and can be described across the following locations:

- Talbingo Reservoir – Talbingo Reservoir provides the lower reservoir for the pumped hydro-electric project and will include the tailrace tunnel and water intake structure. The site will also be used for temporary construction compounds and other temporary ancillary activities;
- Lobs Hole – this site will be used primarily for construction (including construction of vertical shafts to the underground power station (ventilation shaft) and headrace tunnel (surge shaft), and a temporary accommodation camp);
- Marica – the site will be used primarily for construction but will also become the main entrance to the power station during operation. Lobs Hole will provide access to the Exploratory Works tunnel, which will be refitted to become the main access tunnel (MAT), as well as the location of the emergency egress, cable and ventilation tunnel (ECVT), portal and associated services;
- Plateau – the land area between Snowy Mountains Highway and Tantangara Reservoir is referred to as the Plateau. The Plateau will be used to access and construct a utility corridor, upgrade access tracks and construct a fish weir on Tantangara Creek;
- Tantangara Reservoir – Tantangara Reservoir will be the upper reservoir for the pumped hydro project and include the headrace tunnel and intake structure. The site will also be used for a temporary construction compound, accommodation camp and other temporary ancillary activities; and
- Rock Forest – a site to be used temporarily for logistics and staging during construction. It located beyond the national park along the Snowy Mountains Highway about 3 km east of Providence Portal.

9.2 DESCRIPTION OF IMPACTS

In the table below a summary of proposed impacts for each survey area is presented. Impacts will occur in 12 of the 28 survey areas.

Table 89 A summary of proposed impacts in each survey area.

Survey Area	Impacts
Lobs Hole Ravine	Talbingo: Reservoir emplacement area; access road; water intake, intake gate structures and buildings; barge launch area; portal and construction compound and tail race tunnel. Lobs Hole: Main works camp; utilities; Lobs Hole Substation; Access roads; excavated rock stockpiles; main portal tunnel and portal buildings; main yard; emergency egress, cable and ventilation tunnel and cableyard.
Marica	Utilities and access roads; headrace surge shaft; pressure tunnels; ventilation shaft; draft tube and collector tunnels.
Gooandra Hill	Impacts minimal ???
Wallaces Creek FT	Nil impacts
Kings Cross Road	Yes
Link Road	Yes
Three Mile Dam	Nil impacts
Gooandra FT	Communications cable
Nungar Creek FT	Communications cable
Tantangara Dam FT	Communications cable
Tantangara Dam Rd Transmission Line	Nil impacts
Schofields FT	Nil impacts
Circuits Hut FT	Nil impacts
Pockets Saddle Road	Nil impacts
Port Phillip Trail	Nil impacts
Tantangara Dam North	Nil impacts
Bullocks Hill FT	Nil impacts
Bullocks Hill Portal	Nil impacts
Hains Hut FT	Nil impacts
Tantangara Dam	Reservoir emplacement area; water intake; portal and construction compound; barge launch area; access roads; communications cable; accommodation camp; intake structure and buildings and access roads and ancillary facilities for emplacement activities.
Tantangara Road	Southern communications cable and access road
Denison	Road access at junction of Tantangara Road and Snowy Mountains Highway
Kiandra	Nil impacts
Rocky Plains	Nil impacts
Rocky Plains Tx Line	Nil impacts
Nungar Creek Trail	Southern communications cable
Rock Forest	Rock Forest logistics yard

9.3 IDENTIFICATION OF HERITAGE IMPACTS

9.3.1 Level of Impact

Descriptions of the nature of impacts proposed within a given survey area are outlined in Section 9.2. In this section, potential impacts are categorised in terms of whether an identified heritage item is:

- inside the footprint disturbance boundary;
- outside the footprint disturbance boundary but within 20 m; or
- outside the footprint disturbance boundary (i.e. >20 m from the footprint disturbance boundary).

It is assumed that any item within the footprint disturbance boundary may potentially be directly (physically) impacted by one or more of the activities proposed in that survey area. Items within 20 m of the footprint disturbance boundary are flagged as being at increased risk of inadvertent impacts and/or indirect (non-physical) impacts. Items greater than 20 m from the footprint disturbance boundary are presumed to be at minimal risk from inadvertent impacts and/or subject to more minor indirect impacts.

9.3.2 Impacts on Heritage

The resultant impacts on heritage for a given item have been assessed with consideration to the level of impact that is anticipated at that item, together with the overall impacts anticipated across its respective complex/thematic group and survey area. This approach has been adopted so as to ensure that the cumulative impacts to the heritage values of items outside the footprint disturbance boundary are accounted for.

For items within the footprint disturbance boundary, it is assumed that direct (physical) impacts may occur across some or all of the fabric/relics at an identified heritage item, inclusive of its contextual setting. The resultant impacts for items inside the footprint disturbance boundary, in the absence of any mitigation measures, are accordingly assessed as being a potential loss of all heritage values at that item. i.e. the item may effectively be destroyed as the result of the proposed works.

In instances where an item is within 20 m of the footprint disturbance boundary, it is acknowledged that direct impacts are not anticipated. However, indirect (non-physical) impacts may occur in the form of substantial changes to the visual setting and landscape context (e.g. destruction/disturbance to nearby associated features) of an item. Such impacts are likely to result in decreased heritage significance relating to aesthetic, research and representativeness values. i.e. there should be no changes

to the item's historical associations and social values, and the rarity of the item may actually increase through heightened levels of endangerment to a given complex of site type.

A similar scenario applies to items greater than 20 m from the footprint disturbance boundary. Direct impacts are not anticipated at such items, and the extent of indirect impacts to site setting will be more minor. Nevertheless, potential exists for decreases in heritage values at these sites. In particular, it is anticipated that changes to landscape setting, and disturbance to and/or loss of associated features may result in decreased heritage significance relating to aesthetic, research and representativeness values. Furthermore, in the case of items where aspects of heritage significance are unclear due to uncertainties regarding the age, nature and function of items, it is noted that the loss of contextual information from associated features may result in a decrease in heritage significance against all heritage criteria. i.e. in the absence of any mitigation measures, the loss of contextual information from associated features may impede future interpretation and assessment of less tangible items that remain. As such, a precautionary approach has been implemented and, it is noted that the indirect impacts on features of uncertain archaeological research value (e.g. items assessed as being of little to moderate contributory significance due to ambiguities surrounding their age/function/associations/research potential) may actually result in a higher degree of impact against criteria a, b, d and e than what would apply to items that are readily interpretable in their own right (e.g. items of high to exceptional contributory significance).

When assessing harm, a consideration of Ecologically Sustainable Development (ESD) is required. ESD is defined in the Protection of the Environment Administration Act 1991. Section 6(2) of that Act states that ESD requires the effective integration of economic and environmental considerations in decision-making processes and that ESD can be achieved through the implementation of:

- (a) the precautionary principle,
- (b) inter-generational equity,
- (c) conservation of biological diversity and ecological integrity,
- (d) improved valuation, pricing and incentive mechanisms.

The principles of ecological sustainable development and the matter of cumulative harm have been considered for this project, noting consideration of the proposed Transgrid component of the broader project. Given the generally low levels of prior, existing and potential future impacts in the local and regional context in which the proposed activity area is situated (the area is a national park with a conservation charter), most of cultural values, including archaeological, which attach to the local area and the broader landscape would remain largely intact.

In regard to the Transgrid proposal, it is noted that the transmission line footprint traverses a rugged and steep suite of landforms of very low to negligible archaeological potential. It is also acknowledged that the Transgrid footprint is a discrete, linear and relatively small area. Accordingly, in terms of cumulative impacts, the Transgrid proposal is assessed to have little bearing on the Main Works as described and assessed in this report.

The Exploratory Works at Lobs Hole Ravine have caused considerable impact to the historic heritage. However, these impacts have been mitigated by an extensive archival recording including salvage excavations. The cumulative impacts from the Main Project can be considered to be significant. The archival recording program would need to be extended in order to mitigate the cumulative impacts at Lobs Hole.

However, the proposed activities will take place across an extensive area, although not all areas would be impacted in significant ways. For example, much of the project footprint is discrete, narrow and linear areas in which impacts can be considered to be minimal. The heritage values vary across the project area and the impacts would occur within landforms of varying significance and value.

9.4 ASSESSMENT OF HERITAGE IMPACTS

Assessments of the proposed impacts and associated potential heritage impacts are provided below for each survey area. Impacts at each individual heritage item are considered in the context of the overall heritage significance of the complex/group to which it belongs, the contributory significance of each item³ and the level of impact anticipated at the item. The potential heritage impacts are summarised for each item in terms of the results of the proposed works in the absence of any mitigation measures.

A more detailed evaluation of the cumulative heritage impacts across a given study area and group/complex is provided, where the statements of heritage impact include consideration of appropriate mitigation measures associated with different types and levels of impact.

A summary of the assessment of heritage impacts according to individual survey areas is presented in the table below. It is noted that due to changes in the project layout, the majority of survey areas are not outside the project disturbance footprint. Furthermore, in many survey areas, especially narrow and linear alignments of

³ Significance against each criterion is summarised in terms of the level of significance (e.g. Local, State, National or NA) and, where relevant, includes the following additional notation: (C) – contributory significance only, i.e. the item/group/complex does not meet the criterion but contributes to the broader significance of the relevant cultural landscape; (P) – potential significance where it is unclear whether an item/group/complex meets the criterion.

proposed communication cables or road access, the project disturbance footprint avoids many of the historic items. Of the 560 historic items recorded during this assessment, 129 are within the footprint disturbance boundary.

Of the nine previously statutory listed heritage items (s. 170 HHIMS register) in the 12 survey areas in which impacts would occur, four are located within footprint disturbance boundary. These items are elements of the Lobbs Hole Copper Mine and are located within or immediately adjacent to the Yarrangobilly River. Given their environmental context, impact may not occur.

Table 90 Summary of the assessment of heritage impacts according to individual survey areas.

Survey area	Impacts
Lobs Hole Ravine	A total of 129 items across 10 groups/complexes within the survey area. Five of these items are listed in the s. 170 HHIMS register however none are expected to be impacted. 99 of the items are inside the project disturbance footprint, 11 are within 20 m, and 19 are greater than 20 m outside the project disturbance footprint. Of those within the project disturbance footprint, 47 have previously been impacted and/or are the subject of ongoing mitigation measures as part of the Exploratory Works program.
Marica	Eight items representing two themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Marica survey area. Two items are inside the project disturbance footprint, two are within 20 m, and five are greater than 20 m outside the project disturbance footprint.
Gooandra Hill	Seven items representing five themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Gooandra Hill survey area. One item is inside the project disturbance footprint, one is within 20 m, and five are greater than 20 m outside the project disturbance footprint.
Wallaces Creek FT	Nil impacts; the survey area is now outside the project disturbance footprint.
Kings Cross Road	Nine items representing three themes are within the survey area. Four of these items are listed in the s. 170 HHIMS register but are outside the project disturbance footprint. One of the items is inside the project disturbance footprint, four are within 20 m, and four are greater than 20 m outside project disturbance footprint.
Link Road	32 items representing four themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Link Road survey area. Three of the items are inside the project disturbance footprint, three are within 20m, and 26 are greater than 20 m outside the EIS boundary.
Three Mile Dam	Nil impacts; the survey area is now outside the project disturbance footprint.
Gooandra FT	40 items representing four themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Gooandra FT survey area. Seven of the items is inside the

Survey area	Impacts
	project disturbance footprint, 11 are within 20 m, and 22 are greater than 20 m outside the project disturbance footprint.
Nungar Creek FT	Three items representing one theme are within the survey area. No sites listed in the s. 170 HHIMS register are in the Nungar Creek FT survey area. Two items are within 20 m of the project disturbance footprint, and one is greater than 20 m outside the project disturbance footprint.
Tantangara Dam FT	Three items representing two themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Tantangara Dam FT survey area. The three items are greater than 20 m outside the project disturbance footprint.
Tantangara Dam Rd Transmission Line	Nil impacts; the survey area is now outside the project disturbance footprint.
Schofields FT	Nil impacts; the survey area is now outside the project disturbance footprint.
Circuits Hut FT	Nil impacts; the survey area is now outside the project disturbance footprint.
Pockets Saddle Road	Nil impacts; the survey area is now outside the project disturbance footprint.
Port Phillip Trail	Nil impacts; the survey area is now outside the project disturbance footprint.
Tantangara Dam North	Nil impacts; the survey area is now outside the project disturbance footprint.
Bullocks Hill FT	Nil impacts; the survey area is now outside the project disturbance footprint.
Bullocks Hill Portal	Nil impacts; the survey area is now outside the project disturbance footprint.
Hains Hut FT	Nil impacts; the survey area is now outside the project disturbance footprint.
Tantangara Dam	Nine items representing three themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Tantangara Dam survey area. One of the items is inside the EIS boundary, four are within 20 m, and four are greater than 20 m outside the project disturbance footprint.
Tantangara Road	Nine items representing three themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Tantangara Road survey area. One of the items is inside the project disturbance footprint., four are within 20m, and four are greater than 20 m outside the project disturbance footprint.
Denison	Nil impacts; the survey area is now outside the project disturbance footprint.
Kiandra	Nil impacts; the survey area is now outside the project disturbance footprint.
Rocky Plains	Nil impacts; the survey area is now outside the project disturbance footprint.
Rocky Plains Tx Line	Nil impacts; the survey area is now outside the project disturbance footprint.
Nungar Creek Trail	16 items representing four themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Nungar Cree Trail survey area. Ten of the items is inside the project disturbance footprint, five are within 20 m, and one is greater than 20 m outside the project disturbance footprint.

Survey area	Impacts
Rock Forest	Ten items representing four themes are within the survey area. No sites listed in the s. 170 HHIMS register are in the Rock Forest survey area. Five of the items is inside the project disturbance footprint, five are greater than 20 m outside the project disturbance footprint.

A summary of the assessment of heritage impacts in each survey area is presented in the tables below.

9.4.1 Lobs Hole Ravine

Table 91 Overview of significance, proposed impacts and potential heritage impacts in Lobs Hole Ravine.

Lobs Hole – Ravine Township: R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R39, R59, R60, R61, R121, R122							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local	Local	Local	Local	Local	Local	Local	This group of items has clear importance within the context of the development of the Ravine township and its role within the context of the brief success of the Lobs Hole Copper Mines. Many of the items are directly associated with individuals/families of local importance at Ravine (e.g. Julius Forsstrom). They also have ongoing special associations for descendants of families who lived at Lobs Hole and form part of a broader landscape that continues to have strong and special associations with modern recreational users of KNP because of the tangible evidence of the place's history. The remains of the township core are also key components of a broader landscape that is recognised for the interplay between its natural and cultural elements, and they include the remains of the Washington Hotel, which is itself a landmark feature on the banks of the Yarrangobilly River. This group of items also has demonstrated research potential. The remaining extant features, together with the information and assemblages recovered during salvage for the Early Works have considerable potential to contribute to an understanding of a poorly documented aspect of the history of the Snowy Mountains. In particular, they have potential to shed light on the lives of individuals who are not typically well represented in the historical record (e.g. women and children in a remote rural town). This group of items has already been subject to high level impacts. As such the remaining extant features and the assemblages salvaged from sites impacted by the early works form the only physical evidence of this particular aspect of Ravine. Finally, the items in this group form a representative example of the types of archaeological sites and assemblages from a turn of the century town in a relatively remote valley within the Snowy Mountains. The extant items, together with the assemblages recovered from salvaged sites are assessed as having local significance against criteria a, b, c, d, e, f and g.
Item	Contributory Significance				Impact Level		Potential Heritage Impacts

R20	Exceptional	Inside EIS boundary – to be avoided	Substantial alterations to landscape setting of an item of exceptional contributory significance; likely decrease in significance against criteria c and g.
R21	Moderate	Within 20 m	Already impacted and mitigated during early works. No increase in heritage impacts.
R22	Negligible	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R23	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R24	Negligible	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R25	High	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R26	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R27	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R28	Moderate	Within 20 m	Already impacted and mitigated during early works. No increase in heritage impacts.
R29	Little	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R30	Negligible	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R39	Negligible	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R59	Negligible	Within 20 m	Direct impacts to associated items and context; substantial alterations to landscape setting of an item of negligible contributory significance. Negligible overall loss in heritage significance at this item.
R60	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R61	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.

R121	Negligible			Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.		
R122	Little			Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.		
Lobs Hole – Greater Ravine Township: R31, R41, R42, R47, R63, R64, R66, R71, R113							
Heritage Significance							
A	b	c	d	e	f	g	Statement of Significance
Local (C)	Local	Local (P)	Local	Local	Local	Local (P)	These sites contribute to the understanding of the Ravine Township as a whole. They provide insight into the families of the workers at the Lobs Hole Copper Mine and how they adapted to living in this environment. Archaeological potential as demonstrated by the excavations at R71 is quite high and contributes to a deeper understanding of how the families and inhabitants of Lobs Hole built and sustained the township of Ravine. Some of these sites also illustrate the dearth of knowledge relating to how these buildings were used and what they contributed to the community and hence must be investigated archaeologically in order to understand their importance. The features recorded in the Greater Ravine Township are assessed as having local significance against criteria b, d, e and f, contributory significance against criterion a and potential local significance against criterion c and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
R31		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R41		Little to Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R42		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R47		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R63		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R64		Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.

R66	Moderate				Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.		
R71	Moderate				Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.		
R113	Moderate				Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.		
Lobs Hole – Struggle St: R48, R49, R50, R56, R57, R76, R104, R105, R106, R107, R108, R109, R110, R111, R115 and R120: building platforms, horse whim, roads/tracks/paths, artefact scatters, and various earthworks along and around Struggle Street.								
Heritage Significance								
A	b	c	d	e	f	g	Statement of Significance	
Local	Local	Local (C)	Local (P)	Local	Local	Local	Struggle Street was part of the informal mining settlement that developed along the eastern margins of Lick Hole Gully, south of the Lobs Hole Copper Mine. The features in this area form an important component of the mining settlement. They are directly associated with the lives of the individuals who enabled the mine to function. The features also contribute to the broader landscape of Ravine, which is renowned for the presence of historical ruins. Archaeological potential across many of the features is predicted to be quite high. Excavation and survey of these features has the potential to address numerous research questions relating to the nature, form and chronology of mining settlements at Ravine. The items are also collectively representative of early twentieth century mining settlement at Ravine, and are examples of features that are becoming increasingly rare within the valley. The features recorded at Struggle Street are assessed as having local significance against criteria a, b, e, f and g, contributory significance against criterion c and potential local significance against criterion d.	
Item		Contributory Significance			Impact Level		Potential Heritage Impacts	
R48		High			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.	
R49		High to Exceptional			Within 20m		Direct impacts to associated items and context; substantial alterations to landscape setting of an item of high to exceptional contributory significance; likely decrease in significance against criteria c, e and g.	
R50		High			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.	
R56		Little to Moderate			Outside EIS boundary		Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.	

R57	Moderate to High	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate to high contributory significance; potential loss of all heritage values at this item.				
R76	Little to Moderate	Inside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.				
R104	Little to Moderate	Outside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.				
R105	Little to Moderate	Outside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.				
R106	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
R107	High	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.				
R108	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
R109	High	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.				
R110	High	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.				
R111	Moderate to High	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate to high contributory significance; potential loss of all heritage values at this item.				
R115	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
R120	High	Within 20m	Direct impacts to associated items and context; substantial alterations to landscape setting of an item of high contributory significance; likely decrease in significance against criteria c, e and g.				
Lobs Hole – Pastoralism: R1, R3, R4, R15, R18, R35, R43, R65, R73, R92, R93, R97, R100, R103, R129							
Heritage Significance							
A	b	c	d	e	f	g	Statement of Significance

Local	Local (C)	Local (C)	Local	Local	Local	Local (C)	The pastoral items identified at Lobs Hole, particularly those associated with the various phases of the West Pinbeyan Homestead, are important within the context of the history and phasing of non-Aboriginal settlement at Ravine. They are directly associated with the Yan family, who were prominent in local history at both Lobs Hole and Kiandra. The former homestead site is also closely linked with the copper mining activities within the valley. As a group, these items contribute to the aesthetic qualities for which the broader valley is renowned, and they have ongoing social significance for descendants of the residents of Ravine and recreational users of the KNP. The pastoral items that currently remain extant following the Early Works for Snowy 2.0 also form a set of features that are becoming increasingly rare and that demonstrate potential to contribute to an understanding of the different phases of pastoral occupation. This group is assessed as having local significance against criteria a, d, e and f, and local contributory significance against criteria b, c and g.
Item	Contributory Significance		Impact Level		Potential Heritage Impacts		
R1	Moderate - High		Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.		
R3	Little		Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.		
R4	Moderate		Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.		
R15	Little		Within 20 m		Minor alterations to landscape setting at an item of little contributory significance. Minimal overall loss in heritage values.		
R18	Little		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.		
R35	Little		Within 20 m		Already impacted and mitigated during early works. No increase in heritage impacts.		
R43	Little		Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.		
R65	High		Outside EIS boundary		Minor alterations to landscape setting at an item of high contributory significance. Minimal overall loss in heritage values.		
R73	Little		Within 20 m		Minor alterations to landscape setting at an item of little contributory significance; potential loss of all heritage values at this item.		

R92	Little-Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R93	Little	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R97	Little	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.				
R100	Negligible	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of negligible contributory significance. Negligible overall loss in heritage values.				
R103	Little-Moderate	Within 20 m	Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.				
R129	Little	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.				
Lobs Hole – Mining: R2, R5, R9, R10, R11, R12, R13, R14, R45, R46, R51, R62, R67, R68, R69, R72, R74, R75, R81, R90, R91, R96, R112, R114, R117							
Heritage Significance							
A	b	c	d	e	f	g	Statement of Significance
Local	Local	Local	Local	Local	Local	Local	The Lobbs Hole Copper Mine is an important component of the mining history at Lobs Hole. It has a strong association with Adolf Reeckmann and Julius Forsstrom, who were important in developing mining at Lobs Hole and as central figures in the Lobbs Hole Copper Mining Company. The identified items are integral components of the landscape at Lobs Hole, which is renowned for the interplay between cultural features (especially mining) and the broader natural landscape. These items also have ongoing social value for both descendants of the former inhabitants of the valley and modern-day recreational users of the KNP. Collectively, the identified mining items represent a mining complex that is becoming endangered at Lobs Hole and that is representative of copper mining in a remote/inaccessible area. The mining items also demonstrate research potential with an identifiable potential to contribute to an understanding of the different phases of mining and the associated technologies and techniques for identifying ore deposits, and extracting and processing ore. This would also contribute to a broader understanding of the different phases of settlement at Ravine and the effect of mining on those different phases. This group is assessed to be of local significance against criteria a, b, c, d, e, f and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts

R2	Little - Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.
R5	Little - Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.
R9	Little - Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.
R10	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
R11	Negligible	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
R12	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
R13	Little - Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.
R14	Moderate	Within 20 m	Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
R45	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R46	Negligible	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.
R51	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
R62	Little - Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.
R67	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.
R68	Little - Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.

R69	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
R72	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
R74	Little - Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.				
R75	Little - Moderate	Within 20 m	Alterations to landscape setting at an item of little to moderate contributory significance; minimal overall loss of heritage values.				
R81	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R90	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R91	Little - Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R96	Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R99	Little	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R112	Little-Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance; minimal overall loss of heritage values.				
R114	Little-Moderate	Inside EIS boundary	Already impacted and mitigated during early works. No increase in heritage impacts.				
R117	Negligible	Within 20 m	Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.				
Lobs Hole – Transport: R53, R84, R86, R94, R95, R130, R132							
Heritage Significance							
A	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (P)	NA	NA	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.

							Furthermore, the items present limited research potential. Nevertheless, they do contribute to the broader cultural landscape of Lobs Hole. This group of items is assessed as having local contributory significance against criteria c and potential local contributory significance against criteria e.
Item	Contributory Significance			Impact Level		Potential Heritage Impacts	
R53	Little - Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
R84	Little - Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.	
R85	Little - Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.	
R86	Little - Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.	
R94	Little - Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.	
R95	Little - Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.	
R132	Little - Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
Lobs Hole – Agriculture: R80							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	Local (P)	NA	Local (C)	NA	NA	NA	This item is thought to be the site of Elizabeth Frazer’s (nee Thomas) orchard. While it does not have any clear importance in the history of Lobs Hole, it does potentially have importance in association with the Thomas/Frazer family, the Thomas’ being a notable family in the broader history of the valley. It also contributes to the social values of Lobs Hole. The item does not however, display notable aesthetic characteristics nor is it predicted to have research potential. It is not a rare site type, nor representative of its type. This item has potential local significance against criterion b and contributory local significance against criteria d.
Item	Contributory Significance			Impact Level		Potential Heritage Impacts	

R80		Moderate			Within 20m		Already impacted and mitigated during early works. No increase in heritage impacts.	
Lobs Hole – SMA: R36, R37, R38, R44, R52, R54, R77, R79, R83, R102, R119								
Heritage Significance								
a	b	c	d	e	f	g	Statement of Significance	
Local (C)	Local (C)	Local (C)	NA	NA	NA	Local (C)	These items were constructed/used by the SMA during the construction of Talbingo Reservoir, a significant component of the Snowy Scheme. Several of these items are in use. While most of them are not significant features of themselves, they nevertheless form part of a broader landscape of features relating to the SMA and have contributory significance in that context. This group of items has local contributory significance against criteria a, b, c and g.	
Item		Contributory Significance			Impact Level		Potential Heritage Impacts	
R36		Negligible			Outside EIS boundary		Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	
R37		Little-Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.	
R38		Little-Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.	
R44		Little-Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
R52		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
R54		Little to Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.	
R77		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.	
R79		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Minimal overall loss in heritage values.	
R83		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.	
R102		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	

R119	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.		
Lobs Hole – Possible Structure: R6, R17, R19, R34, R40, R101, R116, R128, R133							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (P)	Local (C)	NA	Local	Local	NA	These items have no known, or identifiable important historical or social associations. However, it is noted that additional research/investigation is necessary to fully assess the group’s historical and social associations. The group forms part of a broader landscape that is renowned for its natural beauty and the interplay between that and the various cultural features present across the valley. The items identified within this group are predicted to have good potential to yield information that will at a minimum assist in identifying the period of occupation, function of the structure, and associated themes. Furthermore, the group comprises features that are becoming increasingly rare and/or endangered at Lobs Hole. This group of items is assessed to have potential local significance against criteria a and b, local contributory significance against criteria c, and local significance against criteria e and f.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
R6		Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
R17		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R19		Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
R34		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R40		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R101		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.

R116	Moderate				Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
R128	Moderate				Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
R133	Moderate				Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
Lobs Hole – Miscellaneous: R7, R8, R16, R33, R55, R58, R78, R82, R87, R88, R98, R99, R116, R131							
Heritage Significance							
A	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/unclear research potential. As such, the items do not meet any of the heritage criteria.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
R7		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
R8		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
R16		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.
R33		Moderate			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R58		Negligible			Within 20 m		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.
R78		Little			Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.
R82		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.

R87	Negligible		Outside EIS boundary		Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.			
R88	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.			
R98	Little		Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.			
R130	Negligible		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.			
R131	Negligible		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.			
Lobs Hole – Ravine Cemetery: R118								
Heritage Significance								
A	b	c	d	e	f	g	Statement of Significance	
Local	Local	Local (C)	Local	Local	Local	Local (C)	The Ravine Cemetery is an integral component in the development of the cultural landscape of Lobs Hole. It is directly associated with practices surrounding interment and commemoration of the deceased and has strong connections with the Paterick and Thomas families, who figure more generally in the history of the valley. It also contributes to the broader aesthetics of the landscape and is a place that has ongoing importance for both descendants of Ravine inhabitants and recreational users of KNP. The cemetery is predicted to have local research potential with regard to cemetery layout and specific details relating to burial practices. Ravine Cemetery is also a relatively rare site type within the Snowy Mountains. The site is assessed as having local significance against criteria a, b, d, e and f; and local contributory significance against criteria c and g.	
Item		Contributory Significance			Impact Level			Potential Heritage Impacts
R118		High to Exceptional			Inside EIS boundary			Direct, and potentially high-level impacts to fabric/relics and setting at an item of high to exceptional contributory significance; potential loss of all heritage values at this item.
Lobs Hole – Recreation: R55, R70, R89								
Heritage Significance								
A	b	c	d	e	f	g	Statement of Significance	
NA	NA	NA	NA	NA	NA	NA	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable	

							aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.
Item	Contributory Significance		Impact Level		Potential Heritage Impacts		
R55	Negligible		Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.		
R70	Negligible		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.		
R89	Negligible		Inside EIS boundary		Already impacted and mitigated during early works. No increase in heritage impacts.		

9.4.2 Marica

Table 92 Overview of heritage significance, proposed impacts and potential heritage impacts at Marica.

Marica – Pastoral Items: MSU1/H3, MSU1/H6, MSU4/H1 and MSU8/H1: remains of fences.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	NA	Local (C)	NA	Local (C)	NA	Local (C)	These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The pastoral items in this survey area are not associated with potential archaeological deposits. All the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.
Item	Contributory Significance		Impact Level		Potential Heritage Impacts		
MSU1/H3	Little		Outside EIS boundary		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of little contributory significance; likely decrease in significance against criteria c, e and g.		
MSU1/H6	Little		Within 20m		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of little contributory significance; likely decrease in significance against criteria c, e and g.		

MSU4/H1		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
MSU8/H1		Little			Outside EIS boundary		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of little contributory significance; likely decrease in significance against criteria c, e and g.
Marica – Mining Items: MSU1/H1, MSU1/H2, MSU1/H4 and MSU1/H5: water races.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (P)	Local (C)	NA	Local	NA	Local (C)	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criteria a, c, and g, and local significance against criterion e due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
MSU1/H1		Moderate			Outside EIS boundary		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of moderate contributory significance; likely decrease in significance against criteria c, e and g.
MSU1/H2		Little to Moderate			Outside EIS boundary		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of little to moderate contributory significance; likely decrease in significance against criteria c, e and g.
MSU1/H4		Moderate			Outside EIS boundary		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of moderate contributory significance; likely decrease in significance against criteria c, e and g.
MSU1/H5		Little to Moderate			Within 20m		Direct impacts to associated items and/or context; substantial alterations to landscape setting of an item of little to moderate contributory significance; likely decrease in significance against criteria c, e and g.

9.4.3 Gooandra Hill

Table 93 Overview of heritage significance, proposed impacts and potential heritage impacts at Gooandra Hill.

Gooandra Hill – Pastoral Items: GHSU1/H3: a possible dugout spring.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	The item has no known, or identifiable, important historical or social associations. It does not demonstrate notable aesthetic or technical/creative achievement. It is a common feature within the landscape and present very limited potential for further investigation and research. It does not meet the threshold for local or state listing against any of the heritage criteria.
Item		Contributory Significance			Impact Level	Potential Heritage Impacts	
GHSU1/H3		Negligible			Outside EIS boundary	Very minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	
Gooandra Hill – Mining Items: GHSU1/H2 & GHSU7/H1: a costean and a water race.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (P)	Local (C)	NA	Local	NA	Local (C)	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criteria c, and g, and local significance against criterion e due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Item		Contributory Significance			Impact Level	Potential Heritage Impacts	
GHSU1/H2		Little			Outside EIS boundary	Very minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.	
GHSU7/H1		Little to Moderate			Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.	
Gooandra Hill – SMA Items: GHSU1/H1: Gooandra Trig							
Heritage Significance							

a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local (C)	NA	NA	NA	Local (C)	The survey marker is in good condition and is a good example of its type that stands out as a cultural feature within an area that otherwise appears largely unmodified. While it has no known strong or special historical or social associations of itself, the item has contributory significance against criteria a and b as part of the broader landscape of the SMA, and specifically as part of the evidence of activities associated with surveying the Snowy Mountains. It also has local contributory significance against criterion c and g as part of the broader landscape of survey infrastructure for the SMA.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
GHSU1/H1		Moderate			Outside EIS boundary		Very minor alterations to landscape setting at an item of moderate contributory significance. Negligible overall loss in heritage values.
Gooandra Hill – Items relating to transport: GHSU1/H4: DMR Hut							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local (C)	NA	Local	Local	Local (C)	DMR sites such as this are relatively rare in the KNP. The site is in good condition and has landmark qualities that contribute to the broader cultural landscape of Kiandra and the KNP. While the item has no known strong or special historical or social associations of itself, it does form a key component of DMR infrastructure for road construction and maintenance works in the mid-twentieth century. Further investigation of the site (including archival research and archaeological excavation) is likely to provide information that will contribute to an understanding of the use of the hut and how that compares with DMR records for the structure. This item is assessed as having local contributory significance against criteria a, b, c, and g as part of the road network in the Snowy Mountains. It is also assessed as having local significance against criteria e and f as a relatively rare and intact archaeological site that has the potential to contribute to an understanding of the development of transport in the Snowy Mountains and the history of the DMR.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
GHSU1/H4		Moderate			Outside EIS boundary		Very minor alterations to landscape setting at an item of moderate contributory significance. Negligible overall loss in heritage values.
Gooandra Hill – Miscellaneous Items: GHSU12/H1 and GHSU13/H1: an old electricity commission sign and concrete blocks.							
Heritage Significance							

a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.
Item	Contributory Significance				Impact Level	Potential Heritage Impacts	
GHSU12/H1	Negligible				Within 20m	Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	
GHSU13/H1	Negligible				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	

9.4.4 Kings Cross Road

Table 94 Overview of heritage significance, proposed impacts and potential heritage impacts at Kings Cross Road.

Kings Cross – Pastoral Items: KCSU2/H1, KCSU5/H1, KCSU7/H1 & KCSU7/H2: remains of stock fences.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C)	NA	Local (C)	These items have no known, or identifiable, important historical or social associations. The items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The pastoral items in this survey area are not associated with potential archaeological deposits. In summary, all the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context against criteria c, e and g.
Item	Contributory Significance				Impact Level	Potential Heritage Impacts	
KCSU2/H1	Little to Moderate				Outside EIS boundary	Very minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	
KCSU5/H1	Little				Outside EIS boundary	Very minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	
KCSU7/H1	Little				Outside EIS boundary	Very minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.	

KCSU7/H2	Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
Kings Cross – SMA Items: KCSU7/H4, KCSU7/H5, KCSU7/H6 & KCSU7/H7 – a former SMA camp site (KCSU7/H7) and three SMA stone quarries.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local (C)	NA	Local (KCSU 7/H7)	NA	Local (C)	The quarries and camp site are common site types and have no known strong or special historical or social associations of themselves. The items have contributory significance against criteria a, b c and g as part of the broader landscape of the SMA, and specifically as part of the evidence of construction activities. The Kings Cross SMA camp site also has local significance against criterion e.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
KCSU7/H4		Little			Within 20m		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
KCSU7/H5		Moderate			Within 20m		Minor alterations to landscape setting at an item of moderate contributory significance. Minor overall loss in heritage values.
KCSU7/H6		Little to Moderate			Within 20m		Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.
KCSU7/H7		Little to Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.
Kings Cross – Miscellaneous Items: KCSU7/H3: concrete post support.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	The item has no known, or identifiable important historical or social associations. It is a common site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents very limited/negligible research potential. As such, the item does not fulfil the criteria for listing at either a local or State level.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
KCSU7/H3		Negligible			Within 20m		Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.

9.4.5 Link Road

Table 95 Overview of heritage significance, proposed impacts and potential heritage impacts at Link Road.

Link Road – Pastoral Items: LSU5/H1: an old stock fence.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C)	NA	Local (C)	The item has no known, or identifiable, important historical or social associations. The item is a common features/site types and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The item is not associated with potential archaeological deposits. As such, the item does not meet any of the heritage criteria. Nevertheless, this item forms part of a broader landscape of features relating to the theme of pastoralism and has local contributory significance in that context against criteria c, e and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
LSU5/H1		Little to Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.
Link Road – Mining Items: LSU3/H1, NC9, NC18, NC19, NC24 and NC93: an area of heavily worked mining, tailing mounds, boiler stacks, mining equipment and a costean.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (P)	Local	NA	Local	Local (NC93)	Local (C)	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criterion g, and local significance against criteria c and e due to their overall landmark qualities and potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts

LSU3/H1	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Negligible overall loss in heritage values.				
NC9	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Negligible overall loss in heritage values.				
NC18	Little to Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.				
NC19	Little to Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values				
NC24	Moderate to High	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate to high contributory significance. Negligible overall loss in heritage values				
NC93	High	Outside EIS boundary	Minor alterations to landscape setting at an item of high contributory significance. Negligible overall loss in heritage values.				
Link Road – Items relating to transport: LSU4/H1, LSU5/H2, NC1, NC3, NC4, NC8, NC16, NC20, NC21, NC22 & NC23: old roads, paths and tracks, culverts and bridges.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (P)	Local (C)	NA	Local	Local	Local	The items are part of a larger complex of features that are important in the theme of the development of transport and communication in the Snowy Mountains. As a group these items form a key component of the broader landscape of transport and communication. They also have potential to contribute to an understanding of nineteenth century transport routes and associated communications networks. The identified transport related items collectively form a group that is relatively rare at a local scale in that they represent a range of different infrastructure that span many decades of use. This group of items are of local significance against criteria e, f and g, and local contributory significance against criteria a, and c. They also have potential local significance against criterion b.
Item		Contributory Significance		Impact Level		Potential Heritage Impacts	
LSU4/H1		Moderate		Within 20m		Minor alterations to landscape setting at an item of moderate contributory significance. Negligible overall loss in heritage values.	
LSU5/H2		Little		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item	
NC1		Little to Moderate		Within 20m		Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.	

NC3	Little to Moderate				Within 20m	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.	
NC4	Little to Moderate				Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.	
NC8	Little				Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values	
NC16	Moderate				Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Negligible overall loss in heritage values.	
NC20	Little to Moderate				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
NC21	Moderate to High				Outside EIS boundary	Minor alterations to landscape setting at an item of moderate to high contributory significance. Negligible overall loss in heritage values	
NC22	Moderate to High				Outside EIS boundary	Minor alterations to landscape setting at an item of moderate to high contributory significance. Negligible overall loss in heritage values	
NC23	Moderate to High				Outside EIS boundary	Minor alterations to landscape setting at an item of moderate to high contributory significance. Negligible overall loss in heritage values	
Link Road – Miscellaneous Items: NC5, NC6, NC7, NC10, NC11, NC12, NC13, NC14, NC15, NC17, NC26, LSU5/H3, LSU5/H4 & LSU5/H5: posts, a telegraph pole, modern memorial and old depot/laydown area.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	These items have no known, or identifiable important historical or social associations. They are common site types. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
NC5		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC6		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC7		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.

NC10	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC11	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC12	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC13	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC14	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC15	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
NC17	Little	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
NC26	Little to Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.
LSU5/H3	Negligible	Outside EIS boundary	Minor alterations to landscape setting at an item negligible contributory significance. Negligible overall loss in heritage values.
LSU5/H4	Little to Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Negligible overall loss in heritage values.
LSU5/H5	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.

9.4.6 Gooandra Fire Trail

Table 96 Overview of heritage significance, proposed impacts and potential heritage impacts at Gooandra Fire Trail.

Gooandra Fire Trail – Pastoral Items: GSU1/H1, GSU1/H2 (stock yards), GSU2/H1, GSU6/H2, GSU15/H3, GSU15/H4, GSU19/H1 & GSU22/H2: remains of fences and stock yards.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local: GSU1/H2	NA	Local (C)	These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of

				Local (C)			technical/creative achievement. Most of these pastoral items are not associated with potential archaeological deposits. In summary, the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context. The stockyards (GSU1/H2) site and its earth mound is assessed to be of local heritage significance against criterion e due to the potential to yield information relating to summer grazing in the Snowy Mountains. The other items are assessed to have contributory significance against criterion e, and the complex as a whole has contributory significance against criteria c and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
GSU1/H1		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
GSU1/H2		High			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Minimal overall loss in heritage values.
GSU2/H1		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
GSU6/H2		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
GSU15/H3		Little			Within 20m		Alterations to landscape setting at an item of little to little contributory significance. Negligible overall loss in heritage values.
GSU15/H4		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
GSU19/H1		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
GSU22/H2		Little			Within 20m		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
Gooandra Fire Trail – Mining Items: GSU4/H2, GSU4/H3, GSU4/H4, GSU4/H5, GSU4/H6, GSU5/H2, GSU6/H1, GSU7/H1, GSU7/H3, GSU7/H5, GSU7/H6, GSU7/H7, GSU7/H8, GSU20/H1, GSU22/H1, GSU22/H4, GSU22/H5 and GSU6M: mining features such as water races, costeans, channels, tailings mounds and broader landscapes such as GSU6M (Six Mile Diggings) and the Tantangara Diggings.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (P)	Local	NA	Local	Local	Local	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to

							early twentieth century alluvial mining techniques within the Snowy Mountains. Many of the features identified within this group also demonstrate research potential in their own right (e.g. with regard to miners' residences, and the broader potential to yield information relating to phases and types of mining at Kiandra and the associated engineering) and/or are significant components of the landscape with landmark qualities. The group is also collectively a relatively rare and good example of satellite mining endeavours away from the main Kiandra diggings. While further research is necessary to fully assess their potential significance against criteria a and b, the group has local significance against criteria c, e, f and g. due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
GSU4/H2		Moderate			Within 20m		Alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU4/H3		Moderate to High			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU4/H4		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU4/H5		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU4/H6		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU5/H2		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU6/H1		Moderate to High			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate to high contributory significance. Minimal overall loss in heritage values.
GSU7/H1		Moderate to High			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate to high contributory significance. Minimal overall loss in heritage values.
GSU7/H3		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
GSU7/H5		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.

GSU7/H6	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss/decrease of all heritage values at this item.				
GSU7/H7	Moderate	Within 20m	Alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.				
GSU7/H8	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss/decrease of all heritage values at this item.				
GSU20/H1	Moderate to High	Within 20m	Alterations to landscape setting at an item of moderate to high contributory significance. Minimal overall loss in heritage values.				
GSU22/H1	Moderate	Within 20m	Alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.				
GSU22/H4	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.				
GSU22/H5	High to Exceptional	Outside EIS boundary	Minor alterations to landscape setting at an item of high to exceptional contributory significance. Minimal overall loss in heritage values.				
GSU6M	High to Exceptional	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of high to exceptional contributory significance; potential loss/decrease of all heritage values at this item.				
Gooandra Fire Trail – Items relating to transport: GSU1/H3, GSU5/H1, GSU7/H2, GSU7/H4, GSU9/H1, GSU15/H1, GSU15/H2, GSU15/H5, GSU16/H1, GSU21/H2: old tracks/roads.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (P)	Local (C)	NA	Local (C)	NA	Local (C)	The items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria in their own right. Nevertheless, these items form part of a broader landscape of features relating to the theme of transport, mining and pastoralism and have contributory local significance in that context against criteria a, c, e and g, and potential local significance against criterion b.
Item		Contributory Significance		Impact Level		Potential Heritage Impacts	

GSU1/H3	Little to Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.				
GSU5/H1	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.				
GSU7/H2	Little to Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.				
GSU7/H4	Moderate	Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.				
GSU9/H1	Little to Moderate	Within 20m	Alterations to landscape setting at an item of little to moderate contributory significance. Low overall loss in heritage values				
GSU15/H1	Little to Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.				
GSU15/H2	Little to Moderate	Within 20m	Alterations to landscape setting at an item of little to moderate contributory significance. Low overall loss in heritage values				
GSU15/H5	Little to Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.				
GSU16/H1	Little to Moderate	Within 20m	Alterations to landscape setting at an item of little to moderate contributory significance. Low overall loss in heritage values				
GSU21/H2	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
Gooandra Fire Trail – Miscellaneous Items: GSU3/H1, GSU4/H1, GSU21/H1 and GSU22/H3: areas of scalped earth of unknown purpose and metal debris.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	These items have no known, or identifiable important historical or social associations. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria

Item	Contributory Significance	Impact Level	Potential Heritage Impacts
GSU3/H1	Negligible	Within 20m	Alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values
GSU4/H1	Negligible	Within 20m	Alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
GSU21/H1	Negligible	Outside EIS boundary	Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
GSU22/H3	Negligible	Outside EIS boundary	Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.

9.4.7 Nungar Creek Fire Trail

Table 97 Overview of heritage significance, proposed impacts and potential heritage impacts at Nungar Creek Fire Trail.

Nungar Creek Fire Trail – Pastoral Items: NSU3/H1, NSU3/H2 and NSU4/H1: an unnamed hut site (with no material evidence) remains of fences.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C/P)	NA	Local (C)	<p>These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement.</p> <p>In summary, the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context. The hut site is potentially of local significance against criterion e due to the potential to yield information relating to phasing, duration and nature of pastoral occupation in the Snowy Mountains.</p>
Item	Contributory Significance		Impact Level		Potential Heritage Impacts		
NSU3/H1	Moderate		Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.		
NSU3/H2	Little		Within 20m		Alterations to landscape setting at an item of little contributory significance. Minimal overall loss in heritage values.		

NSU4/H1	Little	Within 20m	Alterations to landscape setting at an item of little contributory significance. Minimal overall loss in heritage values.
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9.4.8 Tantangara Dam Fire Trail

Table 98 Overview of heritage significance, proposed impacts and potential heritage impacts at Tantangara Dam Fire Trail.

Tantangara Dam Fire Trail – Pastoral Items: TFTSU3/H1 and TFTSU4/H1: remains of stock fences.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C)	NA	Local (C)	These items have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. As such, the items do not meet any of the heritage criteria. They do however form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
TFTSU3/H1		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
TFTSU4/H2		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
Tantangara Dam Fire Trail – Miscellaneous Items: TFTSU3/H2: metal debris.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	This item has no known, or identifiable important historical or social associations. It does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not meet any of the heritage criteria.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts

TFTSU3/H2	Negligible	Outside EIS boundary	Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
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9.4.9 Tantangara Dam

Table 99 Overview of heritage significance, proposed impacts and potential heritage impacts at Tantangara Dam.

Tantangara Dam – Pastoral Items: E2, E3, E6, E9, E19, TSU14/H3, TSU15/H2, TSU14/H1 (Sanko Smiths Hut) and TSU15/H1 (hut platform): old sections of stock fences and two hut sites.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (P)	Local (C)	NA	Local (TSU14/H1 & TSU15/H1) Local (C)	NA	Local (C)	Most of these items have no known, or identifiable, important historical or social associations. The only exception is TSU14/H1 and TSU15/H1. However, there is insufficient historical information regarding these items to assess whether or not they meet criterion b. Further investigation is required in order to fully assess the significance of TSU14/H1 and TSU15/H1 against this criterion. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Most of the pastoral items in this survey area are not associated with potential archaeological deposits. However, TSU14/H1 and TSU15/H1 do include areas of potential archaeological deposit. Even though the hut platforms show some signs of disturbance, it is likely that portions of relatively intact archaeological deposits remain in and around the platforms. Excavation of these two items is likely to yield information which would contribute to an understanding of early to mid-twentieth century pastoral occupation in the Snowy Mountains, which would contribute more broadly to an understanding of the patterns of settlement and land use in the Australian Alps. In summary, the items TSU14/H1 and TSU15/H1 are assessed as having local significance against criterion e. All the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context against criterion c, e and g.
Item	Contributory Significance				Impact Level	Potential Heritage Impacts	
E2	Negligible				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.	

E3	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.				
E6	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.				
E9	Negligible	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item negligible contributory significance. Negligible overall loss in heritage values.				
E19	Little	Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.				
TSU14/H1	Moderate to High	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate to high contributory significance; potential loss of all heritage values at this item.				
TSU14/H3	Negligible	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little negligible contributory significance. Negligible overall loss in heritage values.				
TSU15/H1	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
TSU15/H2	Little to Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.				
Tantangara Dam – SMA Items: E4, E5, E11, E13, E18 (twentieth century artefacts, buried machinery, wire rope, survey marker and trig station), Tantangara Dam Airstrip (under water), Tantangara Dam Survey Camp (underwater), Tantangara Intake Structure (in use), Tantangara Dam House (removed), Tantangara Dam (in use), Weather Station (in use), and Quarry.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local Tanta ngara Dam) Local (C)	NA	Local (C/P)	NA	Local Tanta ngara Dam) Local (C)	These items were constructed/used by the SMA during the construction of Tantangara Dam, a significant component of the Snowy Scheme. Many of these items are in use and some are now under the Tantangara Dam water. While most of them are not significant features of themselves, they nevertheless form part of a broader landscape of features relating to the SMA and have contributory significance in that context. This group of items has local contributory significance against criteria a, b, c, e and g. E1 and the site of the former Tantangara Dam House also have potential local significance against criterion e in their own right. The Tantangara Dam itself is a landmark feature that is

							representative of SMA dams and as such has local significance against criteria c and g.
Item	Contributory Significance		Impact Level	Potential Heritage Impacts			
E4	Little to Moderate		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.			
E5	Little		Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.			
E11	Little		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.			
E13	Moderate		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.			
E18	Moderate		Outside EIS boundary	Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.			
Tantangara Dam Airstrip	Negligible		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little negligible contributory significance. Negligible overall loss in heritage values.			
Tantangara Dam Survey Camp	Negligible		Outside EIS boundary	Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.			
Tantangara Intake Structure	Moderate		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.			
Tantangara Dam House	Little to Moderate		Within 20m	Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.			
Tantangara Dam	High		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.			
Weather Station	Moderate		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.			
Quarry	Moderate to High		Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate to high contributory significance; potential loss of all heritage values at this item.			

Tantangara Dam – Mining Items: E7, E8, E10, E12, E15, E16, E17 and E21: mine shaft and costeans.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C)	NA	Local (C)	The mine shaft and costeans have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. This group of items has local contributory significance against criteria c, e and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
E7		Moderate			Outside EIS boundary		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.
E8		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
E10		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
E12		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
E15		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
E16		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
E17		Little			Outside EIS boundary		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.
E21		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
Tantangara Dam –Items relating to Transport: TSU14/H2: section of old road.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	NA	Local (C)	NA	Local (C)	NA	Local (C)	The item has no known, or identifiable important historical or social associations. The item is a common features/site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not meet any of the heritage criteria. Nevertheless, the items form part

							of a broader landscape of features relating to the theme of transport and pastoralism and has contributory significance in that context.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
TSU14/H2		Little to Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.
Tantangara Dam – Miscellaneous Items: E1 and E14: dug out pond/drainage line and stacked rocks.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	These items have no known, or identifiable important historical or social associations. They do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
E1		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
E14		Little			Within 20m		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.

9.4.10 Tantangara Road

Table 100 Overview of heritage significance, proposed impacts and potential heritage impacts at Tantangara Road.

Tantangara Road – Pastoral Items: E29, E30, E36, E39, E47, E48 and E53: old sections of stock fences.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C)	NA	Local (C)	These items have no known, or identifiable, important historical or social associations. The items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. The pastoral items in this survey area are not associated with potential archaeological deposits. In summary, all the items form

							part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context against criteria c, e and g.
Item	Contributory Significance			Impact Level		Potential Heritage Impacts	
E29	Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
E30	Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
E36	Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
E47	Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
E48	Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
E53	Little to Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
Tantangara Road – SMA Items: E31, E37, E38, E40, E41, E42, E43, E44, E45, E55 and E56: quarries, SMA roads, Tantangara Works Centre and Gang Gang Creek Camp.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local (C)	NA	Local /Local (C)	NA	Local /Local (C)	These items were constructed/used by the SMA during the construction of Tantangara Dam, a significant component of the Snowy Scheme. The items include key components of the infrastructure associated with construction of the Tantangara Dam such as the hard rock quarries, road alignments and the site of accommodation for SMA workers. While the items are generally not notable in terms of aesthetic characteristics, they do form part of a broader SMA landscape that is noted in terms of technical engineering achievements at a national level. The Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang Creek Camp (E56) are likely to contain at least some areas of relatively intact archaeological deposits. These items may have potential to yield information that will contribute to an understanding of the logistics, accommodation and living conditions for SMA workers. This group of items has local contributory significance against criteria a, b, c, e and g. The Tantangara Works Centre items (E37, E38, E40, E41, E42, E43, E44) and the Gang Gang

							Creek Camp (E56) also have local significance against criteria e and g. The quarries (E31 and E45) have also been assessed to have local significance against criteria g.
Item	Contributory Significance		Impact Level		Potential Heritage Impacts		
E31	High		Within 20m		Minor alterations to landscape setting at an item of high contributory significance. Minimal overall loss in heritage values.		
E37	Moderate		Within 20m		Minor alterations to landscape setting at an item of little contributory significance. Negligible overall loss in heritage values.		
E38	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.		
E40	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.		
E41	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.		
E42	Moderate to High		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate to high contributory significance; potential loss of all heritage values at this item.		
E43	Moderate to High		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate to high contributory significance; potential loss of all heritage values at this item.		
E44	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.		
E45	High		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of high contributory significance; potential loss of all heritage values at this item.		
E46	Moderate		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.		
E55	Moderate		Within 20m		Minor alterations to landscape setting at an item of moderate contributory significance. Minimal overall loss in heritage values.		

E56	Moderate to High				Within 20m	Minor alterations to landscape setting at an item of moderate to high contributory significance. Minimal overall loss in heritage values.	
Tantangara Road – Mining Items: E50 and E52: areas of worked ground.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	Local (C)	NA	Local (C)	NA	Local (C)	These two areas of worked ground have no known, or identifiable, important historical or social associations. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. This group of items has local contributory significance against criteria c, e and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
E50		Little to Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.
E52		Little to Moderate			Within 20m		Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.
Tantangara Road – Items related to transport: E22, E23, E24, E25, E26, E27, E28, E32, E33, E34, E35, E49 and E54: vestige remnants of various roads, including old SMA roads and stone culverts.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	NA	Local (C)	NA	Local (C)	NA	Local (C)	The items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the items do not meet any of the heritage criteria in their own right. Nevertheless, the items form part of a broader landscape of features relating to the theme of transport and have contributory significance in that context against criteria a, c, e and g.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
E22		Moderate			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.

E23	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E24	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E25	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E26	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E27	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E28	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E32	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E33	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E34	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E35	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.
E49	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.

E54	Moderate			Within 20m	Minor alterations to landscape setting at an item of little to moderate contributory significance. Minimal overall loss in heritage values.		
Tantangara Road – Miscellaneous Items: E51: minor earth works of unknown function and age.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
NA	NA	NA	NA	NA	NA	NA	This item has no known, or identifiable important historical or social associations. It does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not meet any of the heritage criteria.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
E51		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of negligible contributory significance. Negligible overall loss in heritage values.

9.4.11 Nungar Creek Trail

Table 101 Overview of heritage significance, proposed impacts and potential heritage impacts at Nungar Creek Trail.

Nungar Creek Trail – Pastoral Items: NCTSU2/H1, NCTSU2/H2, NCTSU9/H1, NCTSU16/H2 and NCTSU23/H7: Boggy Plain Hut Complex and old fences.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (P)	Local (C)	Local (C)	Local (C)	Local	Local (C)	Local (C)	Most of these items have no known, or identifiable, important historical or social associations. The only exception is NCTSU2/H1, the Boggy Plains Hut complex. However, there is insufficient historical information regarding this item to assess whether or not it meets criterion a. Further investigation is required in order to fully assess NCTSU2/H1's significance against this criterion. As a whole, the items comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Most of the pastoral items in this survey area are not associated with potential archaeological deposits. However, the complex of features at NCTSU2/H1 does include areas of potential archaeological deposit. Even though the main hut platform shows signs of disturbance, it is likely that portions of relatively intact archaeological deposits remain in and around the platform and across the various

								depressions/well identified in association with the building platform. Excavation at this complex is likely to yield information which would contribute to an understanding of early to mid-twentieth century pastoral occupation in the Snowy Mountains, which would contribute more broadly to an understanding of the patterns of settlement and land use in the Australian Alps. In summary, the item NCTSU2/H1 is assessed as having local significance against criterion e and potentially having local significance against criterion a. All the items form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts	
NCTSU2/H1		Moderate to High			Outside EIS boundary		Minor alterations to landscape setting of an item of moderate to high contributory significance; possible decrease in significance against criteria c and g.	
NCTSU2/H2		Little to Moderate			Within 20m		Minor alterations to landscape setting; possible decrease in significance against criteria c and g.	
NCTSU9/H1		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.	
NCTSU16/H2		Little - Moderate			Within 20m		Minor alterations to landscape setting; possible decrease in significance against criteria c and g.	
NCTSU23/H7		Little - Moderate			Within 20m		Minor alterations to landscape setting; possible decrease in significance against criteria c and g.	
Nungar Creek Trail – Mining Items: NCTSU23/H1, NCTSU23/H2, NCTSU23/H3, NCTSU23/H5, NCTSU23/H6 and NCTSU24/H1: sections of water races, a costean, and areas of heavily worked/mined gully (sluicing) and areas of multi-phased surface workings.								
Heritage Significance								
a	b	c	d	e	f	g	Statement of Significance	
Local (P)	Local (P)	Local (C)	Local (C)	Local	NA	Local (C)	These items are part of a broader landscape that has landmark qualities, demonstrable research potential and that is representative of mid-nineteenth to early twentieth century alluvial mining techniques within the Snowy Mountains. While further research is necessary to fully assess their potential significance against criteria a and b, these items are assessed as having contributory significance at a local level against criteria c and g, and local significance against criterion e due to their potential to yield information relating to phases and types of mining at Kiandra and the associated engineering.	
Item		Contributory Significance			Impact Level		Potential Heritage Impacts	

NCTSU23/H1	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
NCTSU23/H2	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
NCTSU23/H3	Little to Moderate	Within 20m	Minor alterations to landscape setting; possible decrease in significance against criteria c and g.				
NCTSU23/H5	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
NCTSU23/H6	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
NCTSU24/H1	Moderate	Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance; potential loss of all heritage values at this item.				
Nungar Creek Trail – Items relating to transport: NCTSU16/H1, NCTSU22/H1 and NCTSU23/H4: vestige remnants of the old Kiandra – Tantangara track dated to the mid-1800s							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (P)	Local (C)	NA	Local (C)	Local (C)	Local (C)	The items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria. Nevertheless, these items form part of a broader landscape of features relating to the theme of transport and pastoralism and have contributory local significance in that context.
Item		Contributory Significance		Impact Level		Potential Heritage Impacts	
NCTSU16/H1		Little to Moderate -		Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	

NCTSU22/H1	Little to Moderate				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
NCTSU23/H4	Little to Moderate				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
Nungar Creek Trail – Miscellaneous Items: NCTSU4/H1 and NCTSU24/H2: an excavated depression and a post, both of unknown function and age.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	These items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
NCTSU4/H1		Negligible			Within 20m		Minor alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
NCTSU24/H2		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.

9.4.12 Rock Forest

Table 102 Overview of heritage significance, proposed impacts and potential heritage impacts at Rock Forest.

Rock Forest – Pastoral Items: CCSU1/H1; CCSU1/H2; CCSU1/H3; CCSU1/H4 and CCSU1/H5: amorphous ground disturbance areas, fences and horse drawn bucket scoop.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	NA	Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	These items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not meet any of the heritage criteria.

							Nevertheless, the items all form part of a broader landscape of features relating to the theme of pastoralism and have contributory significance in that context.
Item	Contributory Significance				Impact Level	Potential Heritage Impacts	
CCSU1/H1	Little				Outside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.	
CCSU1/H2	Little				Outside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.	
CCSU1/H3	Little - Moderate				Outside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting; possible decrease in significance against all heritage criteria.	
CCSU1/H4	Little - Moderate				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
CCSU1/H5	Little - Moderate				Inside EIS boundary	Direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance; potential loss of all heritage values at this item.	
Rock Forest – Agricultural Items: CCSU9/H1: an old cultivation paddock.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	NA	Local (C)	Local (C)	Local	Local	Local	This item is a relatively uncommon site type within the KNP that demonstrates aspects of the cultivation practised prior to formation of the National Park. Research potential exists at this site in relation to ascertaining and documenting the size, type and technique of ploughing utilised, which may in turn inform chronology of site use and/or types of cultivation practised. The cultivation paddock has local significance in terms of its research potential, rarity and representativeness; it meets the heritage criteria at a local level against criteria e, f and g.
Item	Contributory Significance				Impact Level	Potential Heritage Impacts	
CCSU9/H1	Moderate				Outside EIS boundary	Direct impacts to associated items and context; substantial alterations to landscape setting of an item of local significance and moderate contributory significance to the broader cultural landscape; possible decrease in significance against criteria c and g.	
Rock Forest – Mining Items: CCSU3/H1: a costean.							
Heritage Significance							

a	b	c	d	e	f	g	Statement of Significance
Local (C)	NA	Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	The item has no known, or identifiable important historical or social associations. It comprises a common feature/site type and does not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the item presents limited/negligible research potential. As such, the item does not fulfil the criteria for listing at either a local or State level. Nevertheless, the costean forms part of a broader landscape of mining and has contributory significance in that context.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
CCSU3/H1		Little			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of little contributory significance; potential loss of all heritage values at this item.
Rock Forest – Miscellaneous Items: CCSU1/H6; CCSU1/H7 and CCSU8/H1: various collections of materials.							
Heritage Significance							
a	b	c	d	e	f	g	Statement of Significance
Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	Local (C)	These items have no known, or identifiable important historical or social associations. They comprise common features/site types and do not demonstrate notable aesthetic characteristics or a high degree of technical/creative achievement. Furthermore, the items present limited/negligible research potential. As such, the items do not fulfil the criteria for listing at either a local or State level.
Item		Contributory Significance			Impact Level		Potential Heritage Impacts
CCSU1/H6		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
CCSU1/H7		Negligible			Inside EIS boundary		Direct, and potentially high-level impacts to fabric/relics and setting at an item of negligible contributory significance. Negligible overall loss in heritage values.
CCSU8/H1		Negligible			Outside EIS boundary		Direct impacts to associated items and context; substantial alterations to landscape setting at an item of negligible contributory significance. Negligible overall loss in heritage values.

9.5 STATEMENTS OF HERITAGE IMPACT

Statements of heritage impact (SOHIs) have been prepared for each complex/group of items within a given survey area. Each SOHI follows the principles outlined in the HO&DUAP (2002) publication *Statements of Heritage Impact*. In particular, it includes discussion and consideration of the following:

- Aspects of the proposal that respect or enhance the heritage significance of the item(s);
- Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts; and
- Evidence of how and why sympathetic solutions have been considered and/or discounted.

The SOHIs for each survey area are then followed by a summary of the overall impacts across all items/groups/complexes within a survey area. These summaries provide an opportunity to consider the cumulative impacts of the proposed works at a more holistic cultural landscape level.

9.5.1 Lobs Hole Ravine: Statements of Heritage Impact

Table 103 Statements of heritage impact for the Lobs Hole survey area.

Lobs Hole – Ravine Township: R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R39, R59, R60, R61, R121, R122	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The Washington Hotel site (R20) is within the project footprint. The proposed works have been amended to ensure that impacts upon the site will be avoided. Rehabilitation of Lobs Hole will be undertaken following completion of construction works, which may assist in mitigating the impacts upon the broader landscape setting of the site.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The Washington Hotel (R20) is a rare and representative site type of exceptional contributory significance. While this item will be avoided, there will be direct impacts to its landscape setting, which will result in a likely decrease in significance against criteria c and g. The overall heritage impacts at the Washington Hotel will be minor. Mitigation and management measures have already been implemented as part of the Early Works program. Sites R21-R30, R39, R60, R61, R121 and R122 are all within the EIS boundary (or within 20m of the boundary). All of these sites have already been impacted and subject to mitigative action during early works. These sites will not be subject to actions that will increase the impact upon their heritage value. Site R59 will be subject to direct impact with substantial alteration of its landscape setting. Despite the impact there will be negligible overall loss in heritage

	significance as this item has already been assessed as having negligible heritage value.
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the proposed works at Lobs Hole are such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat) that present a range of competing and potentially conflicting interests. As a result, options for avoiding cultural heritage items are limited. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option for achieving a balance between construction priorities and the multifaceted constraints posed within Lobs Hole
Lobs Hole – Greater Ravine Township: R31, R41, R42, R47, R63, R66, R71, R113	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Sites R31, R41, R42, R47, R63, R64, R66, R71 and R113 are all within the EIS boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Site R64 will be subject to direct, and potentially high-level impacts to fabric/relics and setting at an item assessed as possessing moderate contributory significance. The proposed works have the potential to result in the loss of all heritage values associated with this item. If required, these impacts could be further mitigated through archival recording and/or salvage excavation.
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the proposed works at Lobs Hole are such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat) that present a range of competing and potentially conflicting interests. As a result, options for avoiding cultural heritage items are limited. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option for achieving a balance between construction priorities and the multifaceted constraints posed within Lobs Hole
Lobs Hole – Struggle St: Items R48, R49, R50, R56, R57, R76, R104, R105, R106, R107, R108, R109, R110, R111, R115 and R120: building platforms, horse whim, roads/tracks/paths, artefact scatters, and various earthworks along and around Struggle Street	

<p>Aspects of the proposal that respect or enhance the heritage significance of the item(s)</p>	<p>Five of the items at Struggle Street are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the horse whim (R49), three linear earth/stone features of unclear function (R56, R104 and R105), and a small ephemeral hut site (R120). The small subset of features that will be avoided include a rare site type of high to exceptional contributory significance (R49) and a relatively fragile site type of moderate to high contributory significance (R120).</p> <p>Additional features associated with Struggle Street may also exist further to the south, outside the survey area. However, the presence and/or extent of such features is unknown.</p> <p>Rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of those sites that are not directly impacted.</p>
<p>Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts</p>	<p>Eleven (11) of the items at Struggle Street are within the proposed footprint. Direct physical impacts are anticipated at four building platforms (R48, R50, R107, R109, R110,) four road/track features (R57, R106 R108, R111), an artefact scatter (R76) and a stone lined channel (R115). Potential exists for a total loss of heritage values across these sites, which include five sites of high contributory significance (R48, R50, R107, R109 and R110), two sites of moderate to high contributory significance (R57 and R111), three sites of moderate contributory significance (R106, R108 and R115) and one site of little to moderate contributory significance (R76).</p> <p>The overall impacts to items identified at Struggle Street would be very high and would potentially see the loss of a range of important features within this complex.</p> <p>Archival recording of these features has already been conducted as part of the heritage mitigation program for Early Works. Additional mitigation measures would include avoidance of items where feasible. Where impacts cannot be avoided mitigation would include further archival research into Struggle Street, test/salvage excavation at the identified features, monitoring of vegetation clearance across all areas within 100m of the former alignment of Struggle Street and/or 30m of an identified heritage item (including archival recording and test/salvage excavation of any additional features that may be identified), and incorporation of the results of the above mitigation works into a broader interpretation plan for Lobs Hole/Ravine.</p> <p>At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
<p>Evidence of how and why sympathetic solutions have</p>	<p>The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained</p>

been considered and/or discounted	<p>with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.</p>
Lobs Hole – Items relating to Pastoralism: R1, R3, R4, R15, R18, R35, R43, R65, R73, R92, R93, R97, R100, R103, R129	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Sites R1, R3, R4, R35, R92 and R93 are all within the EIS boundary or within 20m of the boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Sites R18, R97, R100 and R129 are all within the EIS boundary and will be subject to direct, and potentially high-level impacts to fabric/relics and setting with potential loss of all heritage values at these items. Despite the impact there will be negligible overall loss in heritage significance as these items have already been assessed as having negligible heritage value.</p> <p>Sites R15, R43, R65, R73 and R103 are all outside the EIS boundary. The proposed works will result in minor alterations to the wider landscape setting may result in some, albeit minimal, overall loss in the identified heritage values of these sites – all of which have been assessed as possessing little to moderate contributory significance.</p> <p>The impacts can be mitigated through archival recording (where this has not already been completed during early works) and avoidance of items where feasible. Where impacts cannot be avoided mitigation would include further archival research, test/salvage excavation at the identified features, monitoring of vegetation clearance across all areas within 30m of an identified heritage item (including archival recording and test/salvage excavation of any additional features that may be identified), and incorporation of the results of the above mitigation works into a broader interpretation plan for Lobs Hole/Ravine. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have	<p>The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained</p>

been considered and/or discounted	<p>with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.</p>
Lobs Hole – Items relating to Mining: R2, R5, R9, R10, R11, R12, R13, R14, R45, R46, R51, R62, R67, R68, R69, R72, R74, R75, R81, R90, R91, R96, R99, R112, R114, R117	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Sites R45, R46, R81, R90, R91, R96, R99 and R114 are all inside the EIS boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Sites R11 is within the EIS boundary and site R117 is within 20m of the boundary. These sites will be subject to direct, and potentially high-level impacts to fabric/relics and setting at items of negligible contributory significance. There is negligible overall loss in heritage values associated with these items.</p> <p>Sites R2, R5, R9, R13 and R74 are all within the EIS boundary and will be subject to direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance with potential loss of all heritage values associated with these items.</p> <p>Sites R10, R12, R69 and R72 are all within the EIS boundary and will be subject to direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance with potential loss of all heritage values associated with these items.</p> <p>Despite the impact there will be minimal overall loss in heritage significance.</p> <p>Sites R14, R51, R62, R67, R68, R75 and R112 are all outside the EIS boundary. The proposed works will result in minor alterations to the wider landscape setting may result in some albeit minimal overall loss in the identified heritage values of these sites – all of which have been assessed as possessing little to moderate contributory significance.</p> <p>The impacts can be mitigated through archival recording (where this has not already been completed during early works) and avoidance of items where feasible. Where impacts cannot be avoided mitigation would include further archival research, test/salvage excavation at the identified features, monitoring of vegetation clearance across all areas within 30m of an identified heritage item</p>

	(including archival recording and test/salvage excavation of any additional features that may be identified), and incorporation of the results of the above mitigation works into a broader interpretation plan for Lobs Hole/Ravine. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.
Lobs Hole – Items relating to Transport: R53, R84, R85, R86, R94, R95, R132	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Sites R84, R85, R86, R94 and R95 are all inside the EIS boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Sites R53 and R132 will be subject to direct, and potentially high-level impacts to fabric/relics and setting at items assessed as possessing little to moderate contributory significance. The proposed works have the potential to result in the loss of all heritage values associated with these items. The impacts can be mitigated through archival recording (where this has not already been completed during early works) and avoidance of items where feasible. Where impacts cannot be avoided mitigation would include further archival research, test/salvage excavation at the identified features, monitoring of vegetation clearance across all areas within 30m of an identified heritage item (including archival recording and test/salvage excavation of any additional features that may be identified), and incorporation of the results of the above mitigation works into a broader interpretation plan for Lobs Hole/Ravine. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.
Evidence of how and why sympathetic solutions have	The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites.

been considered and/or discounted	Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.
Lobs Hole – Items relating to Agriculture: R80	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Site R80 is within 20m of the EIS boundary. This site has already been impacted upon and subject to mitigative actions during early works. No additional impact upon its heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Not applicable
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.
Lobs Hole – Items relating to SMA: R36, R37, R38, R44, R52, R54, R77, R79, R83, R102, R119	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Sites R54 is inside the EIS boundary. This site has already been impacted upon and subject to mitigative actions during early works. No additional impact upon its heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Sites R77 and R83 are within the boundary of the EIS area. These sites will be subject to direct, and potentially high-level impacts to fabric/relics and setting at items of negligible contributory significance. There is negligible overall loss in heritage values associated with these items.

	<p>Sites R44, R52 and R102 are all within the EIS boundary and will be subject to direct, and potentially high-level impacts to fabric/relics and setting at an item of little to moderate contributory significance with potential loss of all heritage values associated with these items.</p> <p>Site R119 is inside the EIS boundary and will be subject to direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance with potential loss of all heritage values associated with this item.</p> <p>Sites R36-R38 and R79 are all outside the EIS boundary. The proposed works will result in minor alterations to the wider landscape setting may result in some, albeit minimal, overall loss in the identified heritage values of these sites – all of which have been assessed as possessing little to moderate contributory significance. The impacts can be mitigated through archival recording (where this has not already been completed during early works) and avoidance of items where feasible. Where impacts cannot be avoided mitigation would include further archival research, test/salvage excavation at the identified features, monitoring of vegetation clearance across all areas within 30m of an identified heritage item (including archival recording and test/salvage excavation of any additional features that may be identified), and incorporation of the results of the above mitigation works into a broader interpretation plan for Lobs Hole/Ravine. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.</p>
Lobs Hole – Possible Structures: R6, R17, R19, R34, R40, R101, R116, R128, R133	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Sites R17, R34, R40 and R101 are inside the EIS boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.</p>

Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Sites R6, R19, R116, R128 and R133 are inside the EIS boundary and will be subject to direct, and potentially high-level impacts to fabric/relics and setting at an item of moderate contributory significance with potential loss of all heritage values associated with these items.</p> <p>The impacts can be mitigated through archival recording (where this has not already been completed during early works) and avoidance of items where feasible. Where impacts cannot be avoided mitigation would include further archival research, test/salvage excavation at the identified features, monitoring of vegetation clearance across all areas within 30m of an identified heritage item (including archival recording and test/salvage excavation of any additional features that may be identified), and incorporation of the results of the above mitigation works into a broader interpretation plan for Lobs Hole/Ravine. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites.</p> <p>Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.</p>
Lobs Hole – Miscellaneous: R7, R8, R16, R33, R58, R78, R82, R87, R88, R98, R130, R131	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Sites R33, R78 and R98 are inside the EIS boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Sites R7, R8, R16, R58, R82, R88, R130 and R131 are within the boundary of the EIS area or within 20m of the boundary. These sites will be subject to direct, and potentially high-level impacts to fabric/relics and setting at items of negligible contributory significance. There is negligible overall loss in heritage values associated with these items.</p> <p>Site R87 is outside the EIS boundary. The proposed works will result in minor alterations to the wider landscape setting may result in some albeit minimal overall loss in the identified heritage values of these sites</p>

	– all of which have been assessed as possessing little to moderate contributory significance.
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.
Lobs Hole – Ravine Cemetery: R118	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Site R118 is inside the EIS boundary. This site has been assessed as having high to exceptional contributory significance. The proposed works will have a minor impact on the curtilage of the site. It will avoid known recorded elements of the cemetery. No additional impact upon its heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Not applicable
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.
Lobs Hole – Items relating to Recreation: R55, R70, R89	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Sites R55 and R89 are inside the EIS boundary. These sites have already been impacted upon and subject to mitigative actions during early works. No additional impact upon their heritage values is proposed. Further, rehabilitation of Lobs Hole will be undertaken following completion of construction works, which will assist in respecting and conserving the broader landscape setting of these sites, any extant fabric and associated heritage value.

Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Site R70 is within the boundary of the EIS area. This site will be subject to direct, and potentially high-level impacts to fabric/relics and setting at items of negligible contributory significance. There is negligible overall loss in heritage values associated with this item.
Evidence of how and why sympathetic solutions have been considered and/or discounted	The nature of the works proposed at Lobs Hole is such that there are limited options for avoiding sites. Furthermore, the topography of the valley is constrained with regard to where construction activities can be undertaken. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and the multifaceted constraints posed within Lobs Hole.
Summary SOHI for Lobs Hole	
<p>The Washington Hotel (R20) is a rare and representative site type of exceptional contributory significance. While this item will be avoided, there will be direct impacts to its landscape setting, which will likely result in a decrease in its significance against criteria c and g. Nevertheless, the overall heritage impacts at the Washington Hotel will be minor and mitigation and management measures have already been implemented as part of the Early Works program.</p> <p>Other proposed impacts at Lobs Hole would result in direct (physical) impacts to 18 sites assessed as having negligible contributory significance, 11 sites assessed as having little to moderate contributory significance, 14 sites assessed as having moderate significance, two sites with moderate to high significance and five sites with high significance. Of the 126 identified heritage items, there are 44 items where the proposed works will result in direct impacts that are additional to what has already occurred during early works. There are also 17 items that remain outside the EIS boundary. The indirect heritage impacts at these sites would be minor to negligible and be restricted to changes in the overall landscape setting. These impacts would have negligible heritage impact on these identified items.</p> <p>The overall heritage impacts at Lobs Hole are likely to be moderate to high, particularly within the context of cumulative impacts to the cultural landscape. These heritage impacts will be minor in the context of the broader cultural landscape of the Snowy Mountains. These impacts can also be further mitigated through a program of archival recording together with additional archival research and test/salvage excavation. The results of any such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.</p>	

9.5.2 Marica: Statements of Heritage Impact.

Table 104 Statements of heritage impact for the Marica survey area.

Marica – Pastoral Items: MSU1/H3, MSU1/H6, MSU4/H1 and MSU8/H1: remains of fences.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Three of the four pastoral items at Marica are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the three identified fence remains (MSU1/H3, MSU1/H6 and MSU8/H1) which are all of little contributory significance.

	Additional pastoral features may also exist either side of the Marica survey area. However, the presence and/or extent of such features is unknown.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>One of the identified pastoral items is within the proposed footprint (MSU4/H1) Direct physical impacts are anticipated at these fence remains of little contributory significance. This item is assessed as not meeting the heritage criteria in its own right. While direct impacts are not anticipated at any of the other three identified pastoral features, substantial landscape changes are anticipated nearby at the intersection of the Snowy Mountains Highway and the proposed access road to the main entrance to the power station. Those landscape changes (e.g. vegetation clearance and earthworks; construction of new access road) will result in moderate to high levels of indirect impacts to the identified pastoral items, which are all situated at the eastern end of the Marica survey area. Potential exists for a likely decrease in heritage values against criteria c, and g at the following three pastoral items: MSU1/H3, MSU1/H6 and MSU8/H1 (all of little contributory significance).</p> <p>Given the relatively low contributory significance of the identified pastoral items at Marica, heritage impacts to the broader pastoral landscape would be low.</p> <p>A buffer zone of at least 10m will also be established and fenced as a no-go area at item MSU1/H6, which is within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>As discussed above, there will be no direct physical impacts to three of the four identified pastoral items at Marica. While impacts could theoretically be further reduced through selection of an alternative alignment for the access road to the main entrance to the power station, the topographic constraints are such that alternative options would require higher levels of landscape modification, which would result in unacceptable levels of cumulative environmental impact. Furthermore, given that pastoral heritage items are common in this portion of the study area, options for avoiding impacts to all items are unlikely to exist. Thus, the proposed direct impacts to one item of little contributory significance is considered an acceptable compromise.</p> <p>Overall, the impact area proposed at Marica is highly constrained by topography. All options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Marica.</p>
Marica – Mining Items: MSU1/H1, MSU1/H2, MSU1/H4 and MSU1/H5: water races.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	All four of the identified mining items (water races) at Marica are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at items of moderate contributory

	<p>significance (MSU1/H1 and MSU1/H4) or at items of little to moderate contributory significance (MSU1/H2 and MSU1/H5).</p> <p>Additional mining features may also exist either side of the Marica survey area. However, the presence and/or extent of such features is unknown.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>While direct impacts are not anticipated at any of the identified mining features, substantial landscape changes are anticipated nearby at the intersection of the Snowy Mountains Highway and the proposed access road to the main entrance to the power station. Those landscape changes (e.g. vegetation clearance and earthworks; construction of new access road) will result in moderate to high levels of indirect impacts to the identified mining items, which are all situated at the eastern end of the Marica survey area. Potential exists for a likely decrease in heritage values against criteria c, e and g at the four mining items.</p> <p>The overall impacts to mining items at Marica would be moderate.</p> <p>These impacts could be mitigated through archival recording of all the identified mining features, which could be accompanied by further archival research into the associated mines and phases of mine workings. The results of those investigations would also contribute to a broader mining interpretation plan for the project area. A buffer zone of at least 10m will also be established and fenced as a no-go area at item MSU1/H5, which is within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>As discussed above, there will be no direct physical impacts at any of the identified mining features at Marica. The only way in which impacts could be further reduced would be to relocate the proposed alignment of the access road to the main entrance to the power station. However, given the topographic constraints regarding access through this area, alternative options for access would be substantially more expensive and require higher levels of landscape modification, which would result in unacceptable levels of cumulative environmental impact.</p> <p>Overall, the impact area proposed at Marica is highly constrained by topography. All options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Marica.</p>
Summary SOHI for Marica	
<p>The proposed impacts at Marica would result in direct (physical) impacts to one of the eight identified heritage items. The item in question is a remnant fence line in poor condition (MSU4/H1) that is of little contributory significance to the broader pastoral landscape. Impacts will be avoided to the seven other remaining items, which comprise three other remains of fences of little contributory significance (MSU1/H3, MSU1/H6 and MSU8/H1), two water races of little to moderate contributory significance (MSU1/H2 and MSU1/H5), and two water races of moderate contributory significance (MSU1/H1 and MSU1/H4).</p>	

The overall heritage impacts at Marica will be low and the overall impacts to the broader cultural landscape of the Snowy Mountains will be minor. These impacts can also be mitigated through a program of archival recording together with additional archival research. The results of such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.3 Gooandra Hill: Statements of Heritage Impact.

Table 105 Statements of heritage impact for the Gooandra Hill survey area.

Gooandra Hill – Pastoral Items: GHSU1/H3: a possible dugout spring.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The pastoral item GHSU1/H3 (possible dugout spring) is outside the proposed footprint and will not be directly impacted by the project. This feature has been assessed as not meeting the heritage significance criteria at either a local or state level, and the item is of only negligible contributory significance to the broader pastoral landscape. It is also noted that the proposed impacts at Gooandra Hill are relatively discrete in nature, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified pastoral item at Gooandra Hill is outside the proposed EIS boundary. Nevertheless, there will be very minor alterations to the landscape setting of GHSU1/H3 (possible dugout spring). Given that this item is of negligible contributory significance to the broader pastoral landscape and given that the proposed impacts are discrete in nature and situated some distance from the item, the overall heritage impacts to pastoral items at Gooandra Hill will be negligible.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Hill are discrete in nature and situated over from the identified pastoral item GHSU1/H3 (possible dugout spring). The potential impacts to heritage values of the identified item and the broader pastoral landscape are indirect and negligible in extent. As such, further consideration of alternative options is not warranted; the overall heritage impacts are already at a minimum.
Gooandra Hill – Mining Items: GHSU1/H2 & GHSU7/H1: a costean and a water race.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The mining items GHSU1/H2 (costean) and GHSU7/H1 (water race) are outside the proposed footprint and will not be directly impacted by the project. These items are assessed as being locally significant in terms of research potential. The costean (GHSU1/H2) is of little contributory significance to the broader mining landscape of Kiandra, and the water race (GHSU7/H1) is of little to moderate contributory significance. It is also noted that the proposed impacts at Gooandra Hill are relatively discrete in nature, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on	The identified mining items at Gooandra Hill are outside the proposed EIS boundary. Nevertheless, there will be

heritage significance, including measures to minimise impacts	minor alterations to the landscape setting of GHSU1/H2 (costean) and GHSU7/H1 (water race). Given that these items will not be directly impacted and given that their primary heritage significance is research potential, the overall heritage impacts to mining items at Gooandra Hill will be minimal. These impacts could be further mitigated through archival recording of the mining features.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Hill are discrete in nature and situated at least 200 m from the identified mining items GHSU1/H2 (costean) and GHSU7/H1 (water race). The potential impacts to heritage values of the identified items and the broader mining landscape are indirect and minimal to negligible in extent.
Gooandra Hill – SMA Items: GHSU1/H1: Gooandra Trig	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The SMA item GHSU1/H1 (Gooandra Trig) is outside the proposed footprint and will not be directly impacted by the project. This feature has been assessed as not meeting the heritage significance criteria at either a local or state level. However, the item is of moderate contributory significance to the broader landscape of survey infrastructure for the SMA. It is also noted that the proposed impacts at Gooandra Hill are relatively discrete in nature, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified SMA items at Gooandra Hill is outside the proposed EIS boundary. Nevertheless, there will be very minor alterations to the landscape setting of GHSU1/H1 (Gooandra Trig). Given that this item will not be directly impacted and given that it is of contributory significance only, the overall heritage impacts to the broader SMA landscape at Gooandra Hill will be negligible.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Hill are discrete in nature and situated 50 m from the identified SMA item GHSU1/H1 (survey marker). The potential impacts to heritage values of the identified item and the broader pastoral landscape are indirect and negligible in extent.
Gooandra Hill – Items relating to transport: GHSU1/H4: DMR Hut	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The DMR Hut (GHSU1/H4) is outside the proposed footprint and will not be directly impacted by the project. This item is assessed as being locally significant in terms of research potential and rarity. It is of moderate contributory significance to the broader landscape of transport infrastructure. It is also noted that the proposed impacts at Gooandra Hill are relatively discrete in nature, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified transport related item at Gooandra Hill is outside the proposed EIS boundary. Nevertheless, there will be very minor alterations to the landscape setting of GHSU1/H4 (DMR Hut). Given that this item will not be directly impacted and given that its primary heritage

	significance is research potential and rarity, the overall heritage impacts to transport related items at Gooandra Hill will be negligible. These impacts could be further mitigated through archival recording of the DMR Hut in its current pre-construction setting.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Hill are discrete in nature and situated at least 300 m from the identified DMR transport item GHSU1/H4 (DMR Hut). The potential impacts to heritage values of the identified item and the broader landscape of transport related infrastructure are indirect and negligible in extent.
Gooandra Hill – Miscellaneous Items: GHSU12/H1 and GHSU13/H1: an old electricity commission sign and concrete blocks.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	One of the miscellaneous items at Gooandra Hill is outside the proposed EIS boundary. No direct impacts are proposed at the old electricity commission sign (GHSU12/H1). It is also noted that the proposed impacts at Gooandra Hill are relatively discrete in nature, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	One of the miscellaneous items at Gooandra Hill is within the proposed footprint. Direct physical impacts are anticipated at GHSU13/H1 (concrete blocks). This item is of negligible contributory significance is assessed as not meeting the heritage criteria in its own right. The proposed impacts would potentially see the loss of one item that is of very limited contributory significance. i.e. the overall impacts to the broader cultural landscape of the Snowy Mountains would be negligible. Avoidance of this feature is not warranted. At features where impacts are avoided and/or within 20 m of the EIS boundary (e.g. GHSU12/H1) a buffer zone of at least 10 m will be established and fenced as a no-go area.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at the Gooandra Hill survey area are relatively discrete in nature. Direct impacts are avoided to all but one of the identified items in this survey area. The only directly impacted site is a miscellaneous feature of negligible contributory significance (GHSU13/H1). The associated heritage impacts from the project are negligible. As such, further consideration of alternative options is not warranted; the overall heritage impacts are already at a minimum.
Summary SOHI for Gooandra Hill	
The proposed impacts at Gooandra Hill would result in direct (physical) impacts to one of the seven identified heritage items. The item where direct impacts are proposed is a feature of contributory significance only: GHSU13/H1 (concrete blocks - negligible contributory significance). The remaining six items are all outside proposed impact areas and many are well over 200 m from proposed impacts. The indirect heritage impacts at these six sites would be minor to negligible changes to overall landscape setting. These impacts would have negligible heritage impact on the identified items.	

The overall heritage impacts at Gooandra Hill will be negligible in the context of the survey area and the broader cultural landscape of the Snowy Mountains. These impacts can also be further mitigated through a program of archival recording together with additional archival research. The results of any such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.4 King Cross Road: Statements of Heritage Impact.

Table 106 Statements of heritage impact for the Kings Cross Road survey area.

Kings Cross – Pastoral Items: KCSU2/H1, KCSU5/H1, KCSU7/H1 & KCSU7/H2: remains of stock fences.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Three of the identified pastoral items at Kings Cross are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the three remains of stock fences at KCSU2/H1, KCSU5/H1 and KCSU7/H1. These features have been assessed as not meeting the heritage significance criteria at either a local or state level. Items KCSU5/H1 and KCSU7/H1 are of little contributory significance to the broader pastoral landscape. Item KCSU7/H1 is of little to moderate contributory significance.</p> <p>Additional pastoral features may also exist either side of Kings Cross Road, outside the survey area. However, the presence and/or extent of such features is unknown. It is also noted that the proposed impacts are primarily restricted to the existing corridor of Kings Cross Road, and as such the impacts on the setting of nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Only one of the identified pastoral items at Kings Cross is within an area of proposed impacts. The item in question is remains of a stock fence (KCSU7/H2). Potential exists for a total loss of heritage values at this site, which is assessed having little contributory significance. Potential impacts to the other three pastoral items will involve only minor alterations to landscape setting.</p> <p>The overall impacts to pastoral items at Kings Cross would be minor. These impacts could be further mitigated through archival recording of the pastoral features.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts at Kings Cross are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The only proposed direct heritage impacts at Kings Cross are to a stock fence of little contributory significance. All of the other identified heritage items at Kings Cross are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.</p>

Kings Cross – SMA Items: KCSU7/H4, KCSU7/H5, KCSU7/H6 & KCSU7/H7 – a former SMA camp site (KCSU7/H7) and three SMA stone quarries.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>All of the SMA items at Kings Cross are outside the proposed footprint and will not be directly impacted by the project. The three quarries KCSU7/H4, KCSU7/H5, and KCSU7/H6 are assessed as not being of heritage significance in their own rights. They are of contributory significance only. Nevertheless, impacts to these items will involve minor alterations to landscape setting only. The former SMA camp KCSU7/H7 is the only SMA item assessed to be of local significance in its own right; this item has identified research potential and is of moderate contributory significance to the broader SMA landscape. There will be no direct impacts to this item; the heritage impacts at this site will be minor and will not impact the identified research potential.</p> <p>It is also noted that the proposed impacts are primarily restricted to the existing corridor of Kings Cross Road, and as such the impacts on the setting of nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>The identified SMA items at Kings Cross are outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the landscape setting of KCSU7/H4, KCSU7/H5, and KCSU7/H6 (quarries) and the SMA camp KCSU7/H7. Given that these items will not be directly impacted and given that the primary heritage significance is the research potential at KCSU7/H7, the overall heritage impacts to SMA items at Kings Cross will be minimal.</p> <p>These impacts could be further mitigated through archival recording of the SMA features. Furthermore, at features where impacts are avoided and/or within 20 m of the EIS boundary a buffer zone of at least 10 m will be established and fenced as a no-go area.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts at Kings Cross are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The only proposed direct heritage impacts at Kings Cross are to a stock fence of little contributory significance. All of the other identified heritage items at Kings Cross are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.</p>
Kings Cross – Miscellaneous Items: KCSU7/H3: concrete post support.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>The concrete post support (KCSU7/H3) is outside the proposed footprint and will not be directly impacted by the project. This item is not of heritage significance in its own right. It is of negligible contributory significance to the broader cultural landscape.</p> <p>It is also noted that the proposed impacts are primarily restricted to the existing corridor of Kings Cross Road,</p>

	and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The concrete post support (KCSU7/H3) is within 20 m of the EIS boundary. There will be minor alterations to the landscape setting of this item. Given that this item will not be directly impacted and given that is of negligible contributory significance, the overall heritage impacts to the broader cultural landscape of Kings Cross will be negligible. Nevertheless, at features where impacts are avoided and/or within 20 m of the EIS boundary a buffer zone of at least 10 m will be established and fenced as a no-go area.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Kings Cross are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The only proposed direct heritage impacts at Kings Cross are to a stock fence of little contributory significance. All of the other identified heritage items at Kings Cross are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.
Summary SOHI for Kings Cross	
<p>The proposed impacts at Kings Cross would result in direct (physical) impacts to one of the nine identified heritage items. The item where direct impacts are proposed is a feature of contributory significance only: KCSU7/H2 (stock fence remains - little contributory significance). The remaining eight items are all outside proposed impact areas and will not be directly impacted. The indirect heritage impacts at these items would be minor changes to overall landscape setting. These impacts would have minimal heritage impact on the identified items.</p> <p>The overall heritage impacts at Kings Cross will be very minor in the context of the survey area and negligible in the context of the broader cultural landscape of the Snowy Mountains. These impacts can also be further mitigated through a program of archival recording together with additional archival research. The results of any such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.</p>	

9.5.5 Link Road: Statements of Heritage Impact.

Table 107 Statements of heritage impact for the Link Road survey area.

Link Road – Pastoral Items: LSU5/H1: an old stock fence.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The stock fence at Link Road is outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at LSU5/H1. This feature has been assessed as not meeting the heritage significance criteria at either a local or state level. The item is of little to moderate contributory significance to the broader pastoral landscape. Additional pastoral features may also exist either side of Link Road, outside the survey area. However, the presence and/or extent of such features is unknown.

	It is also noted that the proposed impacts are primarily restricted to the existing corridor of Link Road, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified pastoral item at Link Road is outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the landscape setting of LSU5/H1. Given that this item will not be directly impacted and is an item of little to moderate contributory significance only, the overall heritage impacts to pastoral items at Link Road will be negligible. These impacts could be further mitigated through archival recording of the fence remains at LSU5/H1.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Link Road are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The only proposed direct heritage impacts at Link Road are to a culvert and pole of little contributory significance, and a former track of little to moderate contributory significance. All of the other identified heritage items at Link Road are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.
Link Road – Mining Items: LSU3/H1, NC9, NC18, NC19, NC24 and NC93: an area of heavily worked mining, tailing mounds, boiler stacks, mining equipment and a costean.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	All of the identified mining items at Link Road are outside the proposed footprint and will not be directly impacted by the project. There will only be minor alterations to the broader landscape setting of the mine workings (LSU3/H1 and NC24), tailing mounds (NC9), boiler stacks (NC18), costean (NC19) and mining equipment (NC93). Those indirect impacts will not affect the identified local heritage significance against criteria e, f and g, nor the potential local significance against criteria a and b. The overall heritage impacts on mining items will be minimal. It is also noted that the proposed impacts are primarily restricted to the existing corridor of Link Road, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified mining items at Link Road are outside the proposed EIS boundary. Nevertheless, there will be very minor alterations to the landscape setting of LSU3/H1 (mine workings), NC9 (tailings mound), NC18 (boiler stacks), NC19 (costean), NC24 (mine workings) and NC93 (mining equipment). Given that these items will not be directly impacted and given that their significance against criteria e, f and g (and potential significance against criteria a and b) will not be impacted, the overall heritage impacts to mining items at Link Road will be minimal.

	These impacts could be further mitigated through archival recording of the mining features.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Link Road are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The only proposed direct heritage impacts at Link Road are to a culvert and pole of little contributory significance, and a former track of little to moderate contributory significance. All of the other identified heritage items at Link Road are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.
Link Road – Items relating to transport: LSU4/H1, LSU5/H2, NC1, NC3, NC4, NC8, NC16, NC20, NC21, NC22 & NC23: old roads, paths and tracks, culverts and bridges.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Nine of the 11 items relating to transport at Link Road are outside the proposed footprint and will not be directly impacted by the project. There will only be minor alterations to the broader landscape setting of the portions of roads and tracks (LSU4/H1, NC1, NC3, NC4, NC8 and NC16), ford/creek crossing (NC21) and two bridges (NC22 and NC23). Those indirect impacts will not affect the identified local heritage significance against criteria e, f and g, contributory local significance against criterion a, nor the potential local significance against criterion b. The overall heritage impacts on items relating to transport will be minimal. It is also noted that the proposed impacts are primarily restricted to the existing corridor of Link Road, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Two of the identified transport related items at Link Road are within the EIS Boundary. Direct physical impacts are anticipated at LSU5/H2 (culvert) and NC20 (track associated with the ford at NC21). The culvert at LSU5/H2 is of little contributory significance and the track at NC20 is of little to moderate contributory significance. The proposed impacts would potentially see the loss of two items of relatively limited contributory significance. i.e. the overall impacts to the broader landscape of transport related items would be very low. These impacts could be further mitigated through archival recording of the transport related items along Link Road. Furthermore, at features where impacts are avoided and/or within 20 m of the EIS boundary a buffer zone of at least 10 m will be established and fenced as a no-go area.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Link Road are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.

	The only proposed direct heritage impacts at Link Road are to a culvert and pole of little contributory significance, and a former track of little to moderate contributory significance. All of the other identified heritage items at Link Road are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.
Link Road – Miscellaneous Items: NC5, NC6, NC7, NC10, NC11, NC12, NC13, NC14, NC15, NC17, NC26, LSU5/H3, LSU5/H4 & LSU5/H5: posts, a telegraph pole, modern memorial and old depot/laydown area.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Thirteen (13) of the 14 miscellaneous items at Link Road are outside the proposed footprint and will not be directly impacted by the project. There will only be minor alterations to the broader landscape setting of the remnant poles (NC5, NC6, NC7, NC10, NC11, NC12, NC13, NC14, NC15, and LSU5/H5), telegraph pole (NC26), memorial plaque (LSU5/H3) and the laydown area (LSU5/H4). These items have contributory significance only, and the proposed changes to their landscape setting will have negligible impact on that contributory significance. It is also noted that the proposed impacts are primarily restricted to the existing corridor of Link Road, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	One of the identified miscellaneous items at Link Road is within the EIS Boundary. Direct physical impacts are anticipated at NC17 (pole remains). The pole remains are in poor condition, they do not have heritage significance in their own right and are of little contributory value. Furthermore, given that the other nine identified pole remains associated with NC17 will not be directly impacted, the overall heritage impacts will be negligible.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Link Road are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The only proposed direct heritage impacts at Link Road are to a culvert and pole of little contributory significance, and a former track of little to moderate contributory significance. All of the other identified heritage items at Link Road are outside areas of proposed impacts and will not be subject to any direct impacts. The proposed heritage impacts are already minimal in nature.
Summary SOHI for Link Road	
The proposed impacts at Link Road would result in direct (physical) impacts to three of the thirty-two identified heritage items. The items where direct impacts are proposed comprise a remnant pole of little contributory significance only (NC17), remains of a road/track of little to moderate contributory significance (NC20), and a culvert of little contributory significance (LSU5/H2). The remaining 29 items are all outside proposed impact areas and will not be directly impacted. The indirect heritage impacts at these items would be minor	

changes to overall landscape setting. These impacts would have minimal heritage impact on the identified items.

The overall heritage impacts at Link Road will be very minor in the context of the survey area and negligible in the context of the broader cultural landscape of the Snowy Mountains. These impacts can also be further mitigated through a program of archival recording together with additional archival research. The results of any such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.6 Gooandra Fire Trail: Statements of Heritage Impact.

Table 108 Statements of heritage impact for the Gooandra Fire Trail survey area.

Gooandra Fire Trail – Pastoral Items: GSU1/H1, GSU1/H2 (stock yards), GSU2/H1, GSU6/H2, GSU15/H3, GSU15/H4, GSU19/H1 & GSU22/H2: remains of fences and stock yards.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	All eight of the identified pastoral items at Gooandra Fire Trail are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the seven identified fence remains (GSU1/H1, GSU2/H1, GSU6/H2, GSU15/H3, GSU15/H4, GSU19/H1 and GSU22/H2) which are all of little contributory significance. Nor are any impacts proposed at the stock yards and associated hut site (GSU1/H2) which is of high contributory significance. Additional pastoral features may also exist either side of the Gooandra Fire Trail survey area. However, the presence and/or extent of such features is unknown. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	All of the identified pastoral items at Gooandra Fire Trail are outside the proposed EIS boundary. Nevertheless, there will be very minor alterations to the landscape setting of GSU1/H1, GSU1/H2 (stock yards), GSU2/H1, GSU6/H2, GSU15/H3, GSU15/H4, GSU19/H1 & GSU22/H2. Given that all of the fence remains do not meet the heritage criteria in their own right and are of contributory significance only against criteria c, e and g, the proposed impacts on landscape setting will result in a negligible overall loss of heritage values at these sites. Similarly, at the stock yards (GSU1/H2), this item's heritage significance primarily relates to research potential, so the proposed changes to landscape setting will not result in a loss of values against criterion e. The overall heritage impacts to pastoral items at Gooandra Fire Trail would be minimal. These impacts could be further mitigated through archival recording of the pastoral features. The results of those investigations would also contribute to a broader pastoral landscape interpretation plan for the project area.

	Any features situated within 20 m of the EIS boundary will have a buffer zone of at least 10 m established and fenced as a no-go area.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. None of the identified pastoral heritage items at Gooandra Fire Trail will be subject to direct impacts. The proposed heritage impacts are already minimal in nature.
Gooandra Fire Trail – Mining Items: GSU4/H2, GSU4/H3, GSU4/H4, GSU4/H5, GSU4/H6, GSU5/H2, GSU6/H1, GSU7/H1, GSU7/H3, GSU7/H5, GSU7/H6, GSU7/H7, GSU7/H8, GSU20/H1, GSU22/H1, GSU22/H4, GSU22/H5 and GSU6M: mining features such as water races, costeans, channels, tailings mounds and broader landscapes such as GSU6M (Six Mile Diggings) and the Tantangara Diggings.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Fifteen (15) of the 18 identified mining items at Gooandra Fire Trail are outside the proposed footprint and will not be directly impacted by the project. The mining items GSU4/H2 (water race/channel), GSU4/H3 (diggings/ponds), GSU4/H4 (mine workings), GSU4/H5 (mining pits/costeans), GSU4/H6 (ponds), GSU5/H2 (mining pits/costeans), GSU6/H1 (mine workings), GSU7/H1 (possible hut remains/stone feature), GSU7/H3 (water race), GSU7/H5 (mining pit/costean), GSU7/H7 (tailings mounds), GSU20/H1 (mine workings and road), GSU22/H1 (water race), GSU22/H4 (tailings mound) and GSU22/H5 (Tantangara diggings) are outside the proposed footprint and will not be directly impacted by the project. These items are assessed as being locally significant against criteria c, e, f and g. Most of the items are of moderate contributory significance, although the mine workings at GSU4/H4 and GSU6/H1, GSU7/H1 and GSU20/H1 are of moderate to high contributory significance and the Tantangara diggings (GSU22/H5) are of high to exceptional contributory significance. Overall, impacts will be avoided at examples of all the feature types, thus resulting in the conservation of representative examples of all the mining features identified along Gooandra Fire Trail. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Three of the 18 identified mining items at Gooandra Fire Trail are within the proposed footprint. Direct physical impacts are anticipated at GSU7/H6 (mining pit of moderate contributory significance), GSU7/H8 (water race of moderate contributory significance) and GSU6M (the Six Mile Diggings – high to exceptional contributory significance). However, given that works are primarily proposed along the margins of the existing Gooandra Fire Trail, and given that the items of moderate and high

	<p>to exceptional contributory significance are features that extend beyond the corridor of proposed impacts, the physical impacts to fabric will not necessarily be comprehensive. Nevertheless, potential exists for a significant loss of heritage values across these three sites. Potential impacts to the mining items GSU4/H2 (water race/channel), GSU4/H3 (diggings/ponds), GSU4/H4 (mine workings), GSU4/H5 (mining pits/costeans), GSU4/H6 (ponds), GSU5/H2 (mining pits/costeans), GSU6/H1 (mine workings), GSU7/H1 (possible hut remains/stone feature), GSU7/H3 (water race), GSU7/H5 (mining pit/costean), GSU7/H7 (tailings mounds), GSU20/H1 (mine workings and road), GSU22/H1 (water race), GSU22/H4 (tailings mound) and GSU22/H5 (Tantangara diggings) will involve only minor alterations to landscape setting.</p> <p>The overall impacts to mining items at Gooandra Fire Trail would potentially be high, particularly any impacts at the Six Mile Diggings (GSU6M).</p> <p>These impacts could be mitigated through archival recording of all the identified mining features. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. Where impacts cannot be avoided mitigation would include further archival research into the mine workings, and test/salvage excavation within areas of proposed impacts (e.g. sections through water races and mine workings), and incorporation of the results of the above mitigation works into a broader mining interpretation plan for the project area.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.
Gooandra Fire Trail – Items relating to transport: GSU1/H3, GSU5/H1, GSU7/H2, GSU7/H4, GSU9/H1, GSU15/H1, GSU15/H2, GSU15/H5, GSU16/H1, GSU21/H2: old tracks/roads.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Six of the ten identified transport related items at Gooandra Fire Trail are outside the proposed footprint and will not be directly impacted by the project. The following tracks/roads are outside the proposed footprint and will not be directly impacted by the project: GSU5/H1, GSU7/H2, GSU7/H4, GSU9/H1, GSU15/H2, and GSU16/H1. These comprise four items of little to moderate contributory significance and two items of moderate contributory significance. Overall, impacts will be avoided at examples of all the feature types, thus resulting in the conservation of representative examples

	<p>of all the mining features identified along Gooandra Fire Trail.</p> <p>It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Four of the ten identified transport related items at Gooandra Fire Trail are within the proposed footprint. Direct physical impacts are anticipated at two portions of tracks of little to moderate contributory significance (GSU1/H3, GSU15/H1), and two sections of track of moderate contributory significance (GSU15/H5 and GSU21/H2). None of these four items have heritage significance in their own right. Furthermore, given that works are only proposed along the margins of the existing Gooandra Fire Trail, and given that the items where impacts are proposed are largely features that extend beyond the corridor of proposed impacts, the physical impacts to fabric will not necessarily be comprehensive. Overall, potential exists for a moderate loss of heritage values across the transport related items at Gooandra Fire Trail.</p> <p>These impacts could be mitigated through archival recording of all the identified transport related features. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. Where impacts cannot be avoided mitigation would include further archival research into the transport routes, and possible test/salvage excavation within areas of proposed impacts (e.g. sections through roads to inform age/construction), and incorporation of the results of the above mitigation works into a broader transport interpretation plan for the project area.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts at Gooandra Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.</p>
Gooandra Fire Trail – Miscellaneous Items: GSU3/H1, GSU4/H1, GSU21/H1 and GSU22/H3: areas of scalped earth of unknown purpose and metal debris.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>All of the identified miscellaneous items at Gooandra Fire Trail are outside the proposed footprint and will not be directly impacted by the project. The areas of scalped earth and items of metal debris at GSU3/H1, GSU4/H1, GSU21/H1 and GSU22/H3 are assessed as not being of heritage significance in their own right and are of negligible contributory significance. Nevertheless, impacts to these items will involve relatively minor alterations to landscape setting only.</p>

	It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified miscellaneous items at Gooandra Fire Trail are outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the landscape setting of the areas of scalped earth and items of metal debris at GSU3/H1, GSU4/H1, GSU21/H1 and GSU22/H3. Given that these items are all of negligible contributory significance and will not be directly impacted, the overall heritage impacts to miscellaneous items at Gooandra Fire Trail will be negligible.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Gooandra Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. None of the identified miscellaneous heritage items at Gooandra Fire Trail will be subject to direct impacts. The proposed heritage impacts are already negligible in nature.
Summary SOHI for Gooandra Fire Trail	
<p>The proposed impacts at Gooandra Hill would result in direct (physical) impacts to seven of the 40 identified heritage items. There will be no direct impacts at 15 of the identified mining items, six of the transport related items, or any of the miscellaneous or pastoral items. The indirect heritage impacts at these 33 sites would be minor to negligible changes to overall landscape setting. These landscape changes would have minimal heritage impact on the identified items.</p> <p>The items where direct impacts are proposed comprise two portions of tracks of little to moderate contributory significance (GSU1/H3, GSU15/H1), two sections of track of moderate contributory significance (GSU15/H5 and GSU21/H2), a mining pit of moderate contributory significance (GSU7/H6), water race of moderate contributory significance (GSU7/H8) and the Six Mile Diggings (GSU6M), which is an item of high to exceptional contributory significance. The most substantial heritage impacts would be on the mining items. However, given the nature of these sites (items that extend beyond the proposed footprint), the physical impacts to fabric will not necessarily be comprehensive.</p> <p>Furthermore, the majority of mining features will not be directly impacted. As such, a representative set of all the identified mining features along Gooandra Fire Trail will be conserved.</p> <p>The overall heritage impacts at Gooandra Fire Trail will potentially be moderate to high (particularly if impacts cannot be avoided at the Six Mile Diggings). Within the context of the broader cultural landscape of the Snowy Mountains, the impacts along Gooandra Fire Trail would result in an overall negligible level of impacts to the pastoral landscape and miscellaneous items, low level of impacts to the landscape of transport related items, and potential for moderate impacts to the broader mining landscape (NB this is largely dependent upon whether impacts can be avoided at the Six Mile Diggings). These impacts can be mitigated through a program of archival recording together with additional archival research. The results of any such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.</p>	

9.5.7 Nungar Creek Fire Trail: Statements of Heritage Impact.

Table 109 Statements of heritage impact for the Nungar Hill Fire Trail survey area.

Nungar Creek Fire Trail – Pastoral Items: NSU3/H1, NSU3/H2 and NSU4/H1: an unnamed hut site (with no material evidence) remains of fences.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>The pastoral items at Nungar Creek Fire Trail are outside the proposed footprint and will not be directly impacted by the project. The possible hut site and the remains of stock fences at NSU3/H1, NSU3/H2 and NSU4/H1 are assessed as not being of heritage significance in their own right. Nevertheless, impacts to these items will involve minor alterations to landscape setting only. While the possible hut site at NSU3/H1 is assessed to have potential local research significance against criterion e, minor alterations to the landscape setting of this item are unlikely to affect any potential research significance.</p> <p>It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>The identified pastoral items at Nungar Creek Fire Trail are outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the landscape setting of possible hut site (NSU3/H1 – moderate local contributory significance) and the remains of stock fences at, NSU3/H2 and NSU4/H1 (both of little local contributory significance). Given that these items will not be directly impacted and given that they are of little to moderate local contributory significance (i.e. do not have heritage significance in their own right), the overall heritage impacts to pastoral items at Nungar Creek Fire Trail will be minimal.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts at Nungar Creek Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. None of the identified heritage items at Nungar Creek Fire Trail will be subject to direct impacts. The proposed heritage impacts are already minimal in nature.</p>
Summary SOHI for Nungar Creek Fire Trail	
<p>The proposed impacts at Nungar Creek Fire Trail would result in no direct (physical) impacts to the three identified heritage items. All three of the identified items are outside proposed impact areas and will not be directly impacted. The indirect heritage impacts at these items would be minor changes to overall landscape setting. These impacts would have minimal heritage impact on the identified items.</p> <p>The overall heritage impacts at Nungar Creek Fire Trail will be minimal in the context of the survey area and negligible in the context of the broader cultural landscape of the Snowy Mountains. These impacts can also be further mitigated through a program of archival recording together with additional archival research. The results of any such additional</p>	

recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.8 Tantangara Dam Fire Trail: Statement of Heritage Impact.

Table 110 Statements of heritage impact for the Tantangara Dam Fire Trail survey area.

Tantangara Dam Fire Trail – Pastoral Items: TFTSU3/H1 and TFTSU4/H2: remains of stock fences.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The pastoral items at Tantangara Fire Trail are outside the proposed footprint and will not be directly impacted by the project. The remains of stock fences at TFTSU3/H1 and TFTSU4/H2 are assessed as not being of heritage significance in their own right and are of little local contributory significance against criteria c, e and g. Nevertheless, impacts to these items will involve minor alterations to landscape setting only. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified pastoral items at Tantangara Fire Trail are outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the landscape setting of the stock fences at TFTSU3/H1 and TFTSU4/H2. Given that these items will not be directly impacted and given that they are of little local contributory significance, the overall heritage impacts to mining items at Tantangara Fire Trail will be negligible.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. None of the identified heritage items at Tantangara Fire Trail will be subject to direct impacts. The proposed heritage impacts are already negligible in nature.
Tantangara Dam Fire Trail – Mining Items: TFTSU4/H1: Two costeans.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The mining item at Tantangara dam Fire Trail is outside the proposed footprint and will not be directly impacted by the project. The costeans at TFTSU4/H1 are assessed as not being of heritage significance in their own right and are of little to moderate local contributory significance against criteria c and e. Nevertheless, impacts to this item will involve minor alterations to landscape setting only. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on	The identified mining item at Tantangara Dam Fire Trail are outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the

heritage significance, including measures to minimise impacts	landscape setting of the costeans at TFTSU4/H1. Given that this item will not be directly impacted and given that it does not have heritage significance in its own right (little to moderate contributory significance only) the overall heritage impacts to mining items at Tantangara Dam Fire Trail will be minimal.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Dam Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. None of the identified heritage items at Tantangara Fire Trail will be subject to direct impacts. The proposed heritage impacts are already negligible in nature.
Tantangara Dam Fire Trail – Miscellaneous Items: TFTSU3/H2: metal debris.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	The miscellaneous item at Tantangara Dam Fire Trail is outside the proposed footprint and will not be directly impacted by the project. The metal debris at TFTSU3/H2 is assessed as not being of heritage significance in its own right and is of negligible contributory significance. Nevertheless, impacts to this item will involve minor alterations to landscape setting only. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified miscellaneous item at Tantangara Fire Trail is outside the proposed EIS boundary. Nevertheless, there will be minor alterations to the landscape setting of the metal debris at TFTSU3/H2. Given that this item will not be directly impacted and given that the item is of negligible contributory significance the overall heritage impacts to miscellaneous items at Tantangara Dam Fire Trail will be negligible.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Dam Fire Trail are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. None of the identified heritage items at Tantangara Fire Trail will be subject to direct impacts. The proposed heritage impacts are already negligible in nature.
Summary SOHI for Tantangara Dam Fire Trail	
<p>The proposed impacts at Tantangara Dam Fire Trail would result in no direct (physical) impacts to the four identified heritage items. All four of the identified items are outside proposed impact areas and will not be directly impacted. The indirect heritage impacts at these items would be minor changes to overall landscape setting. These impacts would have minimal heritage impact on the identified items.</p> <p>The overall heritage impacts at Tantangara Dam Fire Trail will be very minimal in the context of the survey area and negligible in the context of the broader cultural landscape of the Snowy Mountains. These impacts can also be further mitigated through a program of</p>	

archival recording together with additional archival research. The results of any such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.9 Tantangara Dam: Statements of Heritage Impact.

Table 111 Statements of heritage impact for the Tantangara Dam survey area.

Tantangara Dam – Pastoral Items: E2, E3, E6, E9, E19, TSU14/H3, TSU15/H2, TSU14/H1 (Sanko Smiths Hut) and TSU15/H1 (hut platform): old sections of stock fences and two hut sites.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Three of the nine pastoral items at Tantangara Dam are outside the proposed footprint and will not be directly impacted by the project. The remains of stock fences at E3, E6, E19 are assessed as not being of heritage significance in their own right and are of little local contributory significance against criteria c, e and g. Nevertheless, impacts to these items will involve minor alterations to landscape setting only.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Six of the nine pastoral items identified at Tantangara Dam are within the proposed footprint. Direct physical impacts are anticipated at the fence remains E2, E9, TSU14/H3 and TSU15/H2, and two hut sites TSU14/H1 and TSU15/H1. Potential exists for a total loss of heritage values across these sites. The sites comprise three items of negligible contributory significance (E2, E9 and TSU14/H3), one item of little to moderate contributory significance (TSU15/H2) and two items of moderate to high contributory significance TSU14/H1 and TSU15/H1, that also have local significance in their own right against criterion e.</p> <p>The overall impacts to pastoral items identified at Tantangara Dam would be high and would potentially see the loss of two items of local significance and four items of local contributory significance.</p> <p>These impacts could be mitigated through archival recording of all the identified pastoral features. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. Where impacts cannot be avoided mitigation would include further archival research into the pastoral items, and test/salvage excavation at TSU14/H1 and TSU15/H1. The results of the above mitigation works would be incorporated into a broader pastoral interpretation plan for the project area.</p> <p>At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have	Proposed impacts at Tantangara Dam include construction of the headrace tunnel and intake structure, and establishment of a temporary construction

been considered and/or discounted	<p>compound, accommodation camp and other temporary ancillary items. The works proposed at Tantangara Dam are key components of the Snowy 2.0 project. Furthermore, the nature of the topography at Tantangara Dam is such that there are limited options for conducting the proposed works. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Tantangara Dam.</p>
Tantangara Dam – SMA Items: E4, E5, E11, E13, E18 (twentieth century artefacts, buried machinery, wire rope, survey marker and trig station), Tantangara Dam Airstrip (under water), Tantangara Dam Survey Camp (underwater), Tantangara Intake Structure (in use), Tantangara Dam House (removed), Tantangara Dam (in use), Weather Station (in use), and Quarry.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Four of the 12 SMA items identified at Tantangara Dam are outside the proposed footprint and will not be directly impacted by the project. The buried machinery at E5, the trig station at E18, the Tantangara Dam Survey Camp and the Tantangara Dam House site will not be directly impacted by the proposed works. Furthermore, it is noted that the Tantangara Dam Survey Camp and the Tantangara Airstrip are already flooded by Tantangara Dam, so there will actually be no changes to the status of these sites, and while the Tantangara Dam itself is partially within the proposed EIS boundary, the overall changes to this item will be negligible.</p> <p>There will be minor changes to the landscape setting of the buried machinery at E5, the trig station at E18 and the Tantangara Dam House. These landscape changes will have minimal impacts on the contributory significance of these three items against criterion c and will not result in any decrease of their heritage values against the other heritage criteria.</p> <p>It is also noted that the proposed impacts at Tantangara Dam are an implementation of aspects of the original plans for the Snowy Mountains Scheme. As such, they will result in implementation of additional levels of technical achievement that will potentially increase the heritage significance of the Snowy Mountains Scheme against criterion c.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Eight of the twelve identified SMA items at Tantangara Dam are within the proposed footprint. The eight items within the EIS boundary are the artefact scatter and any associated archaeological deposits at E4 (little to moderate contributory significance), the steel drums and wire rope at E11 (little contributory significance), the survey marker at E13 (moderate contributory significance) Tantangara Dam Airstrip (flooded item –</p>

	<p>negligible contributory significance), Tantangara Intake Structure (moderate contributory significance), Tantangara Dam (high contributory significance), Weather Station (moderate contributory significance) and the Quarry (moderate to high contributory significance). However, as noted above, the proposal will see no changes to the status of the Tantangara Dam Airstrip, and any changes to the currently operational items of the Tantangara Dam, Tantangara Intake Structure, and the Weather Station will be in keeping with original plans for the Snow Mountains Scheme. As such, the primary heritage impacts to SMA items at Tantangara Dam will be in relation to E4, E11, E13 and the Quarry. Direct and potentially high-level impacts to fabric/relics and setting are anticipated at these items. Potential exists for a total loss of heritage values at one item of little contributory significance (E11), one item of little to moderate contributory significance (E4), one item of moderate contributory significance (E13) and one item of moderate to high contributory significance (Quarry). The overall impacts to SMA items identified at Tantangara Dam would be moderate, high and would potentially see the loss of two items of local significance and four items of local contributory significance. These impacts could be mitigated through archival recording of all the identified SMA features. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. Where impacts cannot be avoided mitigation would also include test/salvage excavation at E4. The results of the above mitigation works would be incorporated into a broader SMA interpretation plan for the project area. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts at Tantangara Dam include construction of the headrace tunnel and intake structure, and establishment of a temporary construction compound, accommodation camp and other temporary ancillary items. The works proposed at Tantangara Dam are key components of the Snowy 2.0 project. Furthermore, the nature of the topography at Tantangara Dam is such that there are limited options for conducting the proposed works. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible. In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Tantangara Dam.</p>

Tantangara Dam – Mining Items: E7, E8, E10, E12, E15, E16, E17 and E21: mine shaft and costeans.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Five of the eight mining items identified at Tantangara Dam are outside the proposed footprint and will not be directly impacted by the project. The mine shaft at E7 and the costeans at E8, E15, E16, and E17 are outside the EIS boundary and will have minor alterations to their landscape setting only. The mine shaft and four costeans are items of contributory significance only. The proposed changes to their landscape setting will have negligible impact on their contributory significance against criteria a, e and g.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Three of the eight mining items identified at Tantangara Dam are within the proposed footprint. Direct physical impacts are anticipated at the following three costeans: E10, E12 and E21. All three items are of little contributory significance and do not have heritage significance in their own right. The overall impacts to mining items identified at Tantangara Dam would be low and would potentially see the loss of three items of local contributory significance. These impacts could be mitigated through archival recording of all the identified mining features and further research into associated mine records. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. The results of the above mitigation works would be incorporated into a broader mining interpretation plan for the project area. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Dam include construction of the headrace tunnel and intake structure, and establishment of a temporary construction compound, accommodation camp and other temporary ancillary items. The works proposed at Tantangara Dam are key components of the Snowy 2.0 project. Furthermore, the nature of the topography at Tantangara Dam is such that there are limited options for conducting the proposed works. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Tantangara Dam.
Tantangara Dam –Items relating to Transport: TSU14/H2: section of old road.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	While the section of old road at TSU14/H2 is within the proposed footprint, the item is not of heritage significance in its own right. Furthermore, any impacts

	to transport related items will be more broadly mitigated through archival recording and development of an interpretation plan for the broader landscape of transport and communications in the Snowy Mountains.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	The identified item relating to transport at Tantangara Dam is within the proposed footprint. Direct physical impacts are anticipated at the remains of the former track TSU14/H2. Potential exists for a total loss of heritage values at this site, which is all of little to moderate contributory significance. Given that the impacted item does not meet the heritage criteria in its own right, the overall heritage impacts would be minimal. These impacts could be further mitigated through archival recording of the identified track features.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Dam include construction of the headrace tunnel and intake structure, and establishment of a temporary construction compound, accommodation camp and other temporary ancillary items. The works proposed at Tantangara Dam are key components of the Snowy 2.0 project. Furthermore, the nature of the topography at Tantangara Dam is such that there are limited options for conducting the proposed works. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Tantangara Dam.
Tantangara Dam – Miscellaneous Items: E1 and E14: dug out pond/drainage line and stacked rocks.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	One of the two miscellaneous items at Tantangara Dam is outside the proposed footprint and will not be directly impacted by the project. The rock stack of unknown function at E14 is assessed as not being of heritage significance in its own right and is of little contributory significance. Nevertheless, impacts to this item will involve minor alterations to landscape setting only.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	One of the two identified miscellaneous items at Tantangara Dam is within the proposed footprint. Direct physical impacts are anticipated at the dugout pond at E1. Potential exists for a total loss of heritage values at this site, which is of little contributory significance. Given that the impacted item does not meet the heritage criteria in its own right, the overall heritage impacts would be minimal. These impacts could be further mitigated through archival recording of the item.
Evidence of how and why sympathetic solutions have	Proposed impacts at Tantangara Dam include construction of the headrace tunnel and intake structure,

<p>been considered and/or discounted</p>	<p>and establishment of a temporary construction compound, accommodation camp and other temporary ancillary items. The works proposed at Tantangara Dam are key components of the Snowy 2.0 project. Furthermore, the nature of the topography at Tantangara Dam is such that there are limited options for conducting the proposed works. This is further complicated by the fact that the project has multiple environmental constraints (e.g. habitat), which means that options for avoiding cultural heritage items are not always feasible</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Tantangara Dam.</p>
<p>Summary SOHI for Tantangara Dam</p>	
<p>The proposed impacts at Tantangara Dam would result in direct (physical) impacts to 18 of the 32 identified heritage items. Fifteen (15) of the items where impacts are proposed comprise items of contributory significance only: E2, E9 and TSU14/H3 (fence remains - negligible contributory significance); TSU15/H2 (fence remains – little to moderate contributory significance); E10, E12 and E21 (costeans – little contributory significance); TSU14/H2 (old track - little to moderate contributory significance); E1 (dugout pond – little contributory significance); E4 (artefacts and any associated archaeological deposits – little to moderate contributory significance); E11 (wire rope and steel drums – little contributory significance); E13 (survey marker – moderate contributory significance); Tantangara Intake Structure (moderate contributory significance); Weather Station (moderate contributory significance); and the Quarry (moderate to high contributory significance).</p> <p>The three items of local significance that will be directly impacted are the two hut sites TSU14/H1 and TSU15/H1 (local significance against criterion e – moderate to high contributory significance), and Tantangara Dam (local significance against criteria c and g – high contributory significance). Nevertheless, it is noted that the impacts to the Tantangara Dam, Tantangara Intake Structure and the Weather Station will be in keeping with original plans for the Snow Mountains Scheme, and as such are consistent with their heritage values.</p> <p>Impacts will be avoided and/or will not result in changes to the 14 other remaining items, which comprise three pastoral items of little contributory significance (E3, E6 and E9 – remains of fences); two SMA items of negligible contributory significance (Tantangara Dam Airstrip and Survey Camp); one SMA item of little contributory significance (E5 – buried machinery), one SMA item of moderate contributory significance (trig station at E18); one SMA item of little to moderate contributory significance (Tantangara Dam House); one mining item of moderate contributory significance (E7 – mine shaft); three four mining items of little contributory significance (E8, E15, E16, and E17 – costeans); and one miscellaneous item of little contributory significance (E14 - rock stack).</p> <p>The overall heritage impacts at Tantangara Dam will be moderate, particularly with regard to impacts at pastoral items and SMA items, and the overall impacts to the broader cultural landscape of the Snowy Mountains will be low. These impacts can also be mitigated through a program of archival recording together with additional archival research and targeted excavation within areas of proposed impacts (The results of such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.</p>	

9.5.10 Tantangara Road: Statements of Heritage Impact.

Table 112 Statements of heritage impact for the Tantangara Road survey area.

Tantangara Road – Pastoral Items: E29, E30, E36, E39, E47, E48 and E53: old sections of stock fences.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	While all of the identified sections of stock fences are within the proposed footprint, none of these items are of heritage significance in their own right. Furthermore, any impacts to pastoral items will be more broadly mitigated through archival recording and development of an interpretation plan for the broader landscape of pastoralism in the Snowy Mountains. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	All seven of the pastoral items at Tantangara Road are inside the proposed footprint. Direct physical impacts are anticipated at E29, E30, E36, E39, E47, E48 and E53. These items comprise old sections of stock fences that are all assessed as not meeting the heritage criteria in their own right. Items E29, E30, E36, E47 and E48 are of little contributory significance against criteria c, e and g. Item E53 is of little to moderate contributory significance against the same criteria. The overall heritage impacts at pastoral items identified at Tantangara Road would be low to moderate and would potentially see the loss of seven items of local contributory significance. These impacts could be mitigated through archival recording and further historical research. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. The results of the above mitigation works would be incorporated into a broader pastoralism interpretation plan for the project area. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Road are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.
Tantangara Road – SMA Items: E31, E37, E38, E40, E41, E42, E43, E44, E45, E55 and E56: quarries, SMA roads, Tantangara Works Centre and Gang Gang Creek Camp.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Four of the 11 SMA items identified at Tantangara Road are outside the proposed footprint. No direct physical impacts are proposed at the hard rock quarry (E31 – high contributory significance), the mechanically levelled area at Tantangara Works Centre (E37 – moderate contributory significance), the section of a former SMA road (E55 – moderate contributory significance) and the Gang Gang Creek Camp (moderate to high contributory

	<p>significance). There will be minor alteration to the landscape setting of these items which will have negligible impact on their respective heritage significance.</p> <p>It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Seven of the 11 SMA items identified at Tantangara Road are inside the proposed EIS boundary. Direct physical impacts are anticipated at E38 (mechanically levelled area at Tantangara Works Centre), E40 (excavated rectilinear pit with wooden reinforcing at Tantangara Works Centre), E41, E44 and E46 (Sections of old SMA roads), E42 and E43 (terraces and platforms at Tantangara Works Centre) and E45 (stone quarry). Items E38, E40, E41, E44 and E46 are all assessed as being of moderate contributory significance. Item E43 is assessed to be of moderate to high contributory significance and item E45 is of high contributory significance. Items E38, E40, E41, E42, E43, and E44 also comprise a complex of features at the Tantangara Works Centre that are assessed as being of local significance against criteria e and g.</p> <p>The overall heritage impacts at SMA items identified at Tantangara Road would be high and would potentially see the loss of seven items of local contributory significance, including five that have local heritage significance in their own right against criteria e and g. These impacts could be mitigated through archival recording and further historical research. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. The results of the above mitigation works would be incorporated into a broader SMA interpretation plan for the project area.</p> <p>At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts at Tantangara Road are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.</p>
Tantangara Road – Mining Items: E50 and E52: areas of worked ground.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>One of the two mining items at Tantangara Road is outside the proposed footprint and will not be directly impacted by the project. The area of worked ground at E52 is assessed as not being of heritage significance in its own right and is of little to moderate local contributory significance against criteria c, e and g. Nevertheless, impacts to this item will involve minor alterations to landscape setting only.</p>

	It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	One of the two mining items at Tantangara Road is inside the proposed footprint. Direct physical impacts are anticipated at E50. The area of worked ground at E50 is of little to moderate contributory significance and does not have heritage significance in its own right. The overall impacts to mining items identified at Tantangara Road would be low and would potentially see the loss of one items of local contributory significance. These impacts could be mitigated through archival recording of all the identified mining features and further research into associated mine records. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. The results of the above mitigation works would be incorporated into a broader mining interpretation plan for the project area. At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Road are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.
Tantangara Road – Items related to Transport: E22, E23, E24, E25, E26, E27, E28, E32, E33, E34, E35, E49 and E54: vestige remnants of various roads, including old SMA roads and stone culverts.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	One of the 13 transport related items at Tantangara Road is outside the proposed footprint and will not be directly impacted by the project. The former track alignment at E54 is assessed as not being of heritage significance in its own right and is of moderate local contributory significance against criteria a, c, e and g. Nevertheless, impacts to this item will involve minor alterations to landscape setting only. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	Twelve (12) of the 13 transport related items at Tantangara Road are inside the proposed footprint. Direct physical impacts are anticipated at E22, E23, E24, E25, E26, E27, E28, E32, E33, E34, E35 and E49. These items comprise vestige remnants of various roads, including old SMA roads and stone culverts that are all assessed as not meeting the heritage criteria in their own right. The items are all of moderate contributory significance. The overall impacts to transport related items identified at Tantangara Road would be moderate and would

	<p>potentially see the loss of 12 items of local contributory significance.</p> <p>These impacts could be mitigated through archival recording of all the identified transport related features and further research into transport routes. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. The results of the above mitigation works would be incorporated into a broader transport and communications interpretation plan for the project area.</p> <p>At features where impacts are avoided, a buffer zone of at least 10m will be established and fenced as a no-go area. This will also apply to any items within 20m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Road are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.
Tantangara Road – Miscellaneous Items: E51: minor earth works of unknown function and age.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	While the identified minor earth works at E51 is within the proposed footprint, this item is assessed as not being of heritage significance in its own right; it is of negligible contributory significance. It is also noted that the proposed impacts are primarily restricted to existing road corridors, and as such the impacts on the setting of all nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>The miscellaneous item at Tantangara Road is inside the proposed footprint. Direct physical impacts are anticipated at E51. The minor earthworks of unknown age and function at E51 is of negligible contributory significance and does not have heritage significance in its own right.</p> <p>The overall impacts to miscellaneous items identified at Tantangara Road would be negligible and would potentially see the loss of one item of negligible local contributory significance.</p> <p>These impacts could be further mitigated through archival recording of the item. Avoidance and/or excavation at this feature is not warranted.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	Proposed impacts at Tantangara Road are primarily constrained to the margins of existing roads. The road alignments dictate the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed.
Summary SOHI for Tantangara Road	
<p>The proposed impacts at Tantangara Road would result in direct (physical) impacts to 28 of the 34 identified heritage items. Most of those items are of contributory significance only. They comprise an area of minor earth works of negligible contributory significance (E51); remains of old fences of little contributory significance (E29, E30, E36, E39, E47, E48); one fence of little to moderate contributory significance (E53); one area of worked ground of little to moderate contributory significance (E50); a section of a SMA road that is of</p>	

moderate contributory significance (E46); and 12 transport related items of moderate contributory significance (E22, E23, E24, E25, E26, E27, E28, E32, E33, E34, E35 and E49). Direct physical impacts are also anticipated at items E38, E40, E41, E42, E43, and E44, which comprise a complex of features at the Tantangara Works Centre that are assessed as being of local significance against criteria e and g; and at E45, a quarry of local significance against criterion g.

Impacts will be avoided to the six other remaining items, which comprise two SMA items of moderate contributory significance (E37 and E55), one SMA item of moderate to high contributory significance (E56), one SMA item of high contributory significance (E31), one mining item of little to moderate contributory significance (E52), and one transport related item of moderate contributory significance (E54).

The overall heritage impacts at Tantangara Road will be moderate to high, particularly with regard to impacts at transport related items and SMA items. The overall impacts to the broader cultural landscape of the Snowy Mountains will be low. These impacts can also be mitigated through a program of archival recording together with additional archival research and targeted excavation within areas of proposed impacts (The results of such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.11 Nungar Creek Trail: Statements of Heritage Impact.

Table 113 Statements of heritage impact for the Nungar Creek Trail survey area.

Nungar Creek Trail – Pastoral Items: NCTSU2/H1, NCTSU2/H2, NCTSU9/H1, NCTSU16/H2 and NCTSU23/H7: Boggy Plain Hut Complex and old fences.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>Four of the five pastoral items at Nungar Creek Trail are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the Boggy Plain Hut Complex (NCTSU2/H1) and the three of the fences (NCTSU2/H2, NCTSU16/H2 and NCTSU23/H7). These features include one item of moderate to high contributory significance (NCTSU2/H1), and three items of little to moderate contributory significance (NCTSU2/H2, NCTSU16/H2 and NCTSU23/H7).</p> <p>Additional pastoral features may also exist either side of the Nungar Creek Trail, outside the survey area. However, the presence and/or extent of such features is unknown.</p> <p>It is also noted that the proposed impacts are primarily restricted to the existing corridor of Nungar Creek Trail, and as such the impacts on the setting of nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Only one of the identified pastoral items at Nungar Creek trail is within an area of proposed impacts. The item in question is a stock fence (NCTSU9/H1). Potential exists for a total loss of heritage values at this site, which is assessed having little contributory significance.</p> <p>Potential impacts to the other four pastoral items will involve only minor alterations to landscape setting.</p> <p>The overall impacts to pastoral items at Nungar Creek Trail would be minor. These impacts could be further mitigated through archival recording of those features.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go</p>

	area. This will also apply to any items within 20 m of the EIS boundary.
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts along the Nungar Creek Trail survey area are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The impact area at NCTSU9/H1 is the only broad area of proposed impacts beyond the existing road corridor. The location of this area is constrained by topography and access requirements to nearby work sites. Nevertheless, the only heritage impacts in this area are to a stock fence of little to moderate contributory significance. Six of the identified heritage items along the Nungar Creek Trail survey area are outside areas of proposed impacts and will not be subject to any direct impacts. This includes the Boggy Plain Hut complex, which is the only item of moderate to high contributory significance identified within the survey area, and the only item assessed as having moderate to high research potential.</p> <p>Overall, the impact area proposed at Nungar Creek Trail is highly constrained by the existing road alignment. However, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Nungar Creek Trail.</p>
Nungar Creek Trail – Mining Items: NCTSU23/H1, NCTSU23/H2, NCTSU23/H3, NCTSU23/H5, NCTSU23/H6 and NCTSU24/H1: sections of water races, a costean, and areas of heavily worked/mined gully (sluicing) and areas of multi-phased surface workings.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>One of mining items at Nungar Creek Trail is outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the costean (NCTSU23/H3), which is an item of little to moderate contributory significance.</p> <p>Additional mining features may also exist either side of the Nungar Creek Trail, outside the survey area. However, the presence and/or extent of such features is unknown.</p> <p>It is also noted that the proposed impacts are primarily restricted to the existing corridor of Nungar Creek Trail, and as such the impacts on the setting of nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Six of the mining items at Nungar Creek Trail are within the proposed footprint. Direct physical impacts are anticipated at two water races (NCTSU23/H1 and NCTSU23/H2) and three areas of mine workings (NCTSU23/H5, NCTSU23/H6 and NCTSU24/H1).</p> <p>However, given that works are only proposed along the margins of the existing Nungar Creek Trail, and given that the items where impacts are proposed are largely features that extend beyond the corridor of proposed impacts, the physical impacts to fabric will not</p>

	<p>necessarily be comprehensive. Potential exists for a significant loss of heritage values across these sites, which are all of moderate contributory significance. Potential impacts to the costean (NCTSU23/H3) will involve only minor alterations to landscape setting. The overall impacts to mining items at Nungar Creek Trail would be high.</p> <p>These impacts could be mitigated through archival recording of all the identified mining features. Additional mitigation measures would include avoidance/limiting of impacts to items where feasible. Where impacts cannot be avoided mitigation would include further archival research into the mine workings, and test/salvage excavation within areas of proposed impacts (e.g. sections through water races and mine workings), and incorporation of the results of the above mitigation works into a broader mining interpretation plan for the project area.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts along the Nungar Creek Trail survey area are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The impact area at NCTSU9/H1 is the only broad area of proposed impacts beyond the existing road corridor. The location of this area is constrained by topography and access requirements to nearby work sites. Nevertheless, the only heritage impacts in this area are to a stock fence of little to moderate contributory significance. Six of the identified heritage items along the Nungar Creek Trail survey area are outside areas of proposed impacts and will not be subject to any direct impacts. This includes the Boggy Plain Hut complex, which is the only item of moderate to high contributory significance identified within the survey area, and the only item assessed as having moderate to high research potential.</p> <p>Overall, the impact area proposed at Nungar Creek Trail is highly constrained by the existing road alignment. However, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Nungar Creek Trail.</p>
Nungar Creek Trail – Items relating to transport: NCTSU16/H1, NCTSU22/H1 and NCTSU23/H4: vestige remnants of the old Kiandra – Tantangara track dated to the mid-1800s	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>While all of the identified portions of the former old Kiandra – Tantangara Track are within the proposed EIS boundary, it is noted that the majority of this former</p>

	<p>historical route is outside the project boundary. Direct impacts are only proposed at minor portions of the former track, that have already been subject to prior disturbance.</p> <p>It is also noted that the proposed impacts are primarily restricted to the existing corridor of Nungar Creek Trail, and as such the impacts on the setting of nearby features will be minimal.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>The three items relating to transport at Nungar Creek Trail are within the proposed footprint. Direct physical impacts are anticipated at the former portions of the Old Kiandra – Tantangara Track (NCTSU16/H1, NCTSU22/H1 and NCTSU23/H4) Potential exists for a total loss of heritage values across these sites, which are all of little to moderate contributory significance. Given that substantial portions of the Old Kiandra – Tantangara Track exist outside the project area, the overall impacts to that track will be minor. These impacts could be mitigated through archival recording of all the identified track features.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts along the Nungar Creek Trail survey area are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The impact area at NCTSU9/H1 is the only broad area of proposed impacts beyond the existing road corridor. The location of this area is constrained by topography and access requirements to nearby work sites. Nevertheless, the only heritage impacts in this area are to a stock fence of little to moderate contributory significance. Six of the identified heritage items along the Nungar Creek Trail survey area are outside areas of proposed impacts and will not be subject to any direct impacts. This includes the Boggy Plain Hut complex, which is the only item of moderate to high contributory significance identified within the survey area, and the only item assessed as having moderate to high research potential. The majority of the former Old Kiandra – Tantangara Track is outside the area of proposed impacts.</p> <p>Overall, the impact area proposed at Nungar Creek Trail is highly constrained by the existing road alignment. However, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Nungar Creek Trail.</p>
Nungar Creek Trail – Miscellaneous Items: NCTSU4/H1 and NCTSU24/H2: an excavated depression and a post, both of unknown function and age.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>One of the miscellaneous items at Nungar Creek Trail is outside the proposed EIS boundary. No direct impacts are proposed at the excavated depression (NCTSU4/H1).</p>

	It is also noted that the proposed impacts are primarily restricted to the existing corridor of Nungar Creek Trail, and as such the impacts on the setting of nearby features will be minimal.
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>One of the miscellaneous items at Nungar Creek Trail is within the proposed footprint (NCTS24/H2). Direct physical impacts are anticipated at this item of negligible contributory significance. This item is not assessed as meeting the heritage criteria in its own right.</p> <p>The proposed impacts would potentially see the loss of one item that is of very limited contributory significance, i.e. the overall impacts to the broader cultural landscape of the Snowy Mountains would be negligible. Avoidance of this features is not warranted.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>Proposed impacts along the Nungar Creek Trail survey area are primarily constrained to the margins of the existing road. The alignment of that road dictates the corridor of proposed impacts. Any changes to the road alignment would result in increased impacts to areas of National Park that are less disturbed. The impact area at NCTS9/H1 is the only broad area of proposed impacts beyond the existing road corridor. The location of this area is constrained by topography and access requirements to nearby work sites. Nevertheless, the only heritage impacts in this area are to a stock fence of little to moderate contributory significance. Six of the identified heritage items along the Nungar Creek Trail survey area are outside areas of proposed impacts and will not be subject to any direct impacts. This includes the Boggy Plain Hut complex, which is the only item of moderate to high contributory significance identified within the survey area, and the only item assessed as having moderate to high research potential.</p> <p>Overall, the impact area proposed at Nungar Creek Trail is highly constrained by the existing road alignment. However, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Nungar Creek Trail.</p>
Summary SOHI for Nungar Creek Trail	
<p>The proposed impacts at Nungar Creek would result in direct (physical) impacts to ten of the 16 identified heritage items. Five of the items where impacts are proposed comprise items of contributory significance only: NCTS9/H1 (stock fence - little to moderate contributory significance); NCTS16/H1, NCTS22/H1 and NCTS23/H4 (portions of the Old Kiandra – Tantangara Track – little to moderate contributory significance) and NCTS24/H2 (post of unknown origin/function – negligible contributory significance). The most substantial heritage impact would be on the five mining items: NCTS23/H1 and NCTS23/H2 (water races – moderate contributory significance) and NCTS23/H5, NCTS23/H6 and NCTS24/H1 (mine workings – moderate contributory significance).</p>	

However, given the nature of these sites (items that extend beyond the proposed footprint), the physical impacts to fabric will not necessarily be comprehensive.

Impacts will be avoided to the six other remaining items, which comprise one pastoral item of local moderate to high contributory significance (NCTSU2/H1 – Boggy Plain Hut complex), three pastoral items of little to moderate contributory significance (NCTSU2/H2, NCTSU16/H2 and NCTSU23/H7 – stock fences), one mining item of little to moderate contributory significance (NCTSU23/H3 – costean) and one miscellaneous item of negligible contributory significance (NCTSU4/H1 – amorphous depression).

The overall heritage impacts at Nungar Creek Trail will be low to moderate, and the overall impacts to the broader cultural landscape of the Snowy Mountains will be low. These impacts can also be mitigated through a program of archival recording together with additional archival research and targeted excavation within areas of proposed impacts (e.g. sections through water races and mine workings). The results of such additional recording and investigations would also be incorporated into broader interpretation plans for the project area.

9.5.12 Rock Forest: Statements of Heritage Impact.

Table 114 Statements of heritage impact for the Rock Forest survey area.

Rock Forest – Pastoral Items: CCSU1/H1; CCSU1/H2; CCSU1/H3; CCSU1/H4 and CCSU1/H5: amorphous ground disturbance areas, fences and horse drawn bucket scoop.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	Three of the pastoral items at Rock Forest are outside the proposed footprint and will not be directly impacted by the project. No direct physical impacts are proposed at the two pits/depressions (CCSU1/H1 and CCSU1/H2), and the stock fence (CCSU1/H3). These three features include two items of little contributory significance (CCSU1/H1 and CCSU1/H2), and one item of little to moderate contributory significance (CCSU1/H3).
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Two of the pastoral items at Rock Forest are within the proposed footprint. Direct physical impacts are anticipated at the rabbit mesh stock fence (CCSU1/H4) and the horse-drawn bucket scoop (CCSU1/H5). Potential exists for a total loss of heritage values across these sites, which are both assessed as being of little to moderate contributory significance. Neither of these items are assessed as meeting the heritage criteria in their own right.</p> <p>The overall impacts to pastoral items identified at Rock Forest would be low to moderate and would potentially see the loss of two items that are of limited contributory significance.</p> <p>Mitigation measures applicable to the Rock Forest pastoral items include archival recording of the complex prior to impacts, and relocation of the horse-drawn bucket scoop (CCSU1/H5). Archival recording would help ensure that the associations between different elements of the pastoral landscape are adequately documented. Relocation of the horse-drawn bucket scoop (CCSU1/H5) would ensure that the fabric of this item is not directly impacted, effectively serving to conserve the item, albeit in an altered context. Given that the impacts in this area would be temporary, options also exist for returning the horse-drawn bucket scoop (CCSU1/H5) to its original</p>

	<p>location following completion of construction activities at Rock Forest.</p> <p>There are no items identified at Rock Forest that warrant additional mitigation measures such as salvage excavation. Furthermore, the archaeological potential across the area of proposed impacts is minimal and does not warrant actions such as monitoring of vegetation/ground disturbance.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>The Rock Forest survey area is proposed for temporary use for logistics and staging during construction. Constraints surrounding the selection of such an area include suitable topography (i.e. relatively level ground) and direct access to the Snow Mountains Highway. All of the items within the proposed EIS boundary are situated on relatively level ground in proximity to the highway, which means that options for avoiding these sites is limited. Nevertheless, over half of the identified pastoral items at Rock Forest will be avoided.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Rock Forest.</p>
Rock Forest – Agricultural Items: CCSU9/H1: an old cultivation paddock.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>The cultivation paddock (CCSU9/H1) is situated over 500 m from the EIS boundary. This item is assessed to be of local significance and moderate contributory significance to the broader cultural landscape of the Rock Forest survey area. There will be no direct impacts to this item and any changes to the broader setting of this item will be temporary in nature.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Several items that are potentially associated with the cultivation paddock (CCSU9/H1) will be directly impacted by the project. These include pastoral items (CCSU1/H4 and CCSU1/H5), a mining costean (CCSU3/H1) and two miscellaneous items of negligible contributory significance (CCSU1/H6 and CCSU1/H7). Of these, the items of greatest relevance are the pastoral items, which form part of the broader landscape of farming at Rock Forest. Archival recording of the pastoral and agricultural items would help ensure that the associations between different elements of the landscape are adequately documented. Temporary relocation of the horse-drawn bucket scoop (CCSU1/H5) would also prevent direct impacts to the fabric of this item, thus helping maintain any associations between it and the cultivation paddock (CCSU9/H1).</p>
Evidence of how and why sympathetic solutions have	<p>The Rock Forest survey area is proposed for temporary use for logistics and staging during construction. Constraints surrounding the selection of such an area</p>

been considered and/or discounted	<p>include suitable topography (i.e. relatively level ground) and direct access to the Snow Mountains Highway. All of the items within the proposed EIS boundary are situated on relatively level ground in proximity to the highway, which means that options for avoiding these sites is limited. Nevertheless, half of the identified heritage items at Rock Forest will be avoided. This includes the cultivation paddock (CCSU9/H1), which is the only item at Rock Forest assessed to be of local heritage significance in its own right.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Rock Forest.</p>
Rock Forest – Mining Items: CCSU3/H1: a costean.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>The proposed impacts at Rock Forest include avoidance of the only item identified as having local heritage significance in its own right (CCSU9/H1 – cultivation paddock). Identified items that are directly impacted are all items of contributory significance only and comprise items of negligible through to little-moderate contributory significance – i.e. impacts are only proposed at items of limited contributory significance.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>The mining item (CCSU3/H1 - costean) at Rock Forest is within the proposed footprint. Direct physical impacts are anticipated at an item that is of contributory significance only. This item is not assessed as meeting the heritage criteria in its own right.</p> <p>The proposed impacts would potentially see the loss of an item that is of quite limited contributory significance. i.e. the overall impacts to the broader mining landscape of the Snowy Mountains would be negligible. Avoidance of this feature is not warranted.</p> <p>Archival recording of the costean could also be undertaken prior to impacts.</p> <p>The costean identified at Rock Forest does not warrant additional mitigation measures such as salvage excavation. Furthermore, the archaeological potential across the area of proposed impacts is minimal and does not warrant actions such as monitoring of vegetation/ground disturbance.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>The Rock Forest survey area is proposed for temporary use for logistics and staging during construction. Constraints surrounding the selection of such an area include suitable topography (i.e. relatively level ground) and direct access to the Snow Mountains Highway. All of the items within the proposed EIS boundary are situated on relatively level ground in proximity to the highway, which means that options for avoiding these sites is</p>

	<p>limited. Nevertheless, half of the identified heritage items at Rock Forest will be avoided. This includes the cultivation paddock (CCSU9/H1), which is the only item at Rock Forest assessed to be of local heritage significance in its own right.</p> <p>In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Rock Forest.</p>
Rock Forest – Miscellaneous Items: CCSU1/H6; CCSU1/H7 and CCSU8/H1: various collections of materials.	
Aspects of the proposal that respect or enhance the heritage significance of the item(s)	<p>The proposed impacts at Rock Forest include avoidance of the only item identified as having local heritage significance in its own right (CCSU9/H1 – cultivation paddock). Identified items that are directly impacted are all items of contributory significance only and comprise items of negligible through to little-moderate contributory significance – i.e. impacts are only proposed at items of limited contributory significance.</p> <p>Furthermore, one of the identified miscellaneous items (CCSU8/H1) will be avoided.</p>
Aspects of the proposal that could detrimentally impact on heritage significance, including measures to minimise impacts	<p>Two of the miscellaneous items at Rock Forest are within the proposed footprint (CCSU1/H6 and CCSU1/H7). Direct physical impacts are anticipated at these two items of negligible contributory significance. These items are assessed as not meeting the heritage criteria in their own right.</p> <p>The proposed impacts would potentially see the loss of two items that are of very limited contributory significance. i.e. the overall impacts to the broader cultural landscape of the Snowy Mountains would be negligible. Avoidance of these features is not warranted. Furthermore, the archaeological potential across the area of proposed impacts is minimal and does not warrant actions such as monitoring of vegetation/ground disturbance.</p> <p>At features where impacts are avoided, a buffer zone of at least 10 m will be established and fenced as a no-go area. This will also apply to any items within 20 m of the EIS boundary.</p>
Evidence of how and why sympathetic solutions have been considered and/or discounted	<p>The Rock Forest survey area is proposed for temporary use for logistics and staging during construction. Constraints surrounding the selection of such an area include suitable topography (i.e. relatively level ground) and direct access to the Snow Mountains Highway. All of the items within the proposed EIS boundary are situated on relatively level ground in proximity to the highway, which means that options for avoiding these sites is limited. Nevertheless, half of the identified heritage items at Rock Forest will be avoided. This includes the cultivation paddock (CCSU9/H1), which is the only item at Rock Forest assessed to be of local heritage significance in its own right.</p>

	In summary, all options for minimising impacts to cultural heritage have been evaluated, and the current works proposal is the preferred option in terms of achieving a balance between construction feasibility and minimal heritage impacts at Rock Forest.
Summary SOHI for Rock Forest	
<p>The proposed impacts at Rock Forest would result in direct (physical) impacts to five items of contributory significance only. These comprise two items of negligible contributory significance (CCSU1/H6 and CCSU1/H7), one item of little contributory significance (CCSU3/H1) and two items of little to moderate contributory significance CCSU1/H4 and CCSU1/H5), one of which can be temporarily relocated, thus avoiding direct physical impacts to its fabric.</p> <p>Impacts will be avoided to the five other remaining items, which comprise one item of local heritage significance (CCSU9/H1 – cultivation paddock), one item of little to moderate contributory significance (CCSU1/H3 – stock fence) two items of little contributory significance (CCSU1/H1 and CCSU1/H2 – pits/depressions) and one item of negligible contributory significance (CCSU8/H1 – machinery pieces).</p> <p>The overall heritage impacts at the Rock Forest will be low, and the overall impacts to the broader cultural landscape of the Snowy Mountains will be negligible. These impacts can also be mitigated through a program of archival recording and/or the temporary relocation of the horse-drawn bucket scoop (CCSU1/H5).</p> <p>It is further noted that the proposed impacts at Rock Forest are temporary in nature, so overall impacts to landscape setting will be minimal and non-permanent.</p>	

10. MANAGEMENT OF IMPACTS

10.1 OVERVIEW

The historical heritage items have been grouped by theme within each survey area. In Section 10.2 a summary overview of proposed impacts is provided for each survey area in which impacts would occur. This section aims to provide a clear indication of the impact mitigation required. For Lobs Hole Ravine it also clearly documents what has been done as part of Exploratory Works impact mitigation. The recommended measures are formulated on the assumption that items inside the EIS boundary will be impacted. In the event that items are avoided, the establishment of no-go zones and archival recording may be required.

10.2 MANAGEMENT OF IMPACTS

A summary overview of proposed impacts is provided for each survey area in the tables below.

Table 115 A summary of impact mitigation measures for Lobs Hole Ravine. The codes are: R (Recommended), EW (completed during early works) and NA (i.e. not recommended). Asterisk denotes item in Exploratory Works and hence currently subject to impact mitigation.

Lobs Hole – Ravine Township			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R20	Exceptional	Inside EIS boundary	R	NA	NA	NA	NA	R
R21*	Moderate	Within 20 m	EW	EW	EW	EW	EW	EW
R22*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R23*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R24*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R25*	High	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R26*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R27*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R28*	Moderate	Within 20 m	EW	EW	EW	EW	EW	EW
R29*	Little	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R30*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R39*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R59	Negligible	Within 20 m	R	NA	NA	NA	NA	NA
R60*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R61*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R121*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R122*	Little	Inside EIS boundary	EW	EW	EW	EW	EW	EW
Lobs Hole – Greater Ravine Township			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R31*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R41*	Little to Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R42*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R47*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R63*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW

R64	Moderate	Inside EIS boundary	R	R	R	NA	NA	R
R66*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R71*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R113*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
Lobs Hole – Struggle St			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R48	High	Inside EIS boundary	NA	R	R	R	R	R
R49	High to Exceptional	Within 20m	R	R	R	R	R	R
R50	High	Inside EIS boundary	NA	R	R	R	R	R
R56	Little to Moderate	Outside EIS boundary	R	R	R	R	NA	R
R57	Moderate to High	Inside EIS boundary	NA	R	R	NA	NA	R
R76	Little to Moderate	Inside EIS boundary	NA	R	R	R	R	R
R104	Little to Moderate	Outside EIS boundary	R	R	R	NA	NA	R
R105	Little to Moderate	Outside EIS boundary	R	R	R	NA	NA	R
R106	Moderate	Inside EIS boundary	NA	R	R	NA	NA	R
R107	High	Inside EIS boundary	NA	R	R	R	R	R
R108	Moderate	Inside EIS boundary	NA	R	R	NA	NA	R
R109	High	Inside EIS boundary	NA	R	R	R	R	R
R110	High	Inside EIS boundary	NA	R	R	R	R	R
R111	Moderate to High	Inside EIS boundary	NA	R	R	NA	NA	R
R115	Moderate	Inside EIS boundary	NA	R	R	R	R	R
R120	High	Within 20m	R	R	R	R	R	R
Lobs Hole – Pastoralism			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan

R1*	Moderate - High	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R3*	Little	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R4*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R15	Little	Within 20 m	R	NA	NA	NA	NA	NA
R18	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R35*	Little	Within 20 m	EW	EW	EW	EW	EW	EW
R43	Little	Outside EIS boundary	R	NA	NA	NA	NA	NA
R65	High	Outside EIS boundary	R	NA	NA	NA	NA	NA
R73	Little	Within 20 m	R	NA	NA	NA	NA	NA
R92*	Little-Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R93	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R97	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R100	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R103	Little-Moderate	Within 20 m	R	NA	NA	NA	NA	NA
R129	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Lobs Hole – Mining			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R2*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R5	Little - Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R9	Little - Moderate	Inside EIS boundary	NA	R	R	R	R	R
R10	Moderate	Inside EIS boundary	NA	R	R	R	R	R
R11	Moderate	Inside EIS boundary	NA	R	R	R	R	R
R12	Moderate	Inside EIS boundary	NA	R	R	R	R	R
R13	Little - Moderate	Inside EIS boundary	NA	R	R	R	R	R
R14	Moderate	Within 20 m	R	NA	NA	NA	NA	NA

R45*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R46*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R51	Moderate	Outside EIS boundary	R	NA	NA	NA	NA	NA
R62	Little - Moderate	Outside EIS boundary	R	NA	NA	NA	NA	NA
R67	Moderate	Outside EIS boundary	R	NA	NA	NA	NA	NA
R68	Little - Moderate	Outside EIS boundary	R	NA	NA	NA	NA	NA
R69	Moderate	Inside EIS boundary	R	NA	NA	NA	NA	NA
R72	Moderate	Inside EIS boundary	R	NA	NA	NA	NA	NA
R74	Little - Moderate	Inside EIS boundary	R	NA	NA	NA	NA	NA
R75	Little - Moderate	Within 20 m	R	NA	NA	NA	NA	NA
R81*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R90*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R91*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R96*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R99*	Little	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R112	Little- Moderate	Outside EIS boundary						
R114*	Little- Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R117	Negligible	Within 20 m	R	NA	NA	NA	NA	NA
Lobs Hole – Transport			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R53	Little - Moderate	Inside EIS boundary	R	NA	NA	NA	NA	NA
R84*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW

R85*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R86*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R94*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R95*	Little - Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R132	Little - Moderate	Inside EIS boundary	R	NA	NA	NA	NA	NA
Lobs Hole – Agriculture			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R80	Moderate	Within 20m	R	NA	NA	NA	NA	NA
Lobs Hole – SMA			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R36	Negligible	Outside EIS boundary	R	NA	NA	NA	NA	NA
R37	Little-Moderate	Outside EIS boundary	R	NA	NA	NA	NA	NA
R38	Little-Moderate	Outside EIS boundary	R	NA	NA	NA	NA	NA
R44	Little-Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R52	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R54*	Little to Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R77	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R79	Little	Outside EIS boundary	R	NA	NA	NA	NA	NA
R83	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R102	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R119	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Lobs Hole – Possible structure			Management and mitigation measures					

Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R6	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R17*	Moderate	Inside EIS boundary	NA	EW	EW	EW	EW	EW
R19	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R34*	Moderate	Inside EIS boundary	NA	EW	EW	EW	EW	EW
R40*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R101*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R116	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R128	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R133	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Lobs Hole – Miscellaneous			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R7	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R8	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R16	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R33*	Moderate	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R58	Negligible	Within 20 m	R	NA	NA	NA	NA	NA
R78*	Little	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R82	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R87	Negligible	Outside EIS boundary	R	NA	NA	NA	NA	NA
R88	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R98*	Little	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R130	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R131	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Lobs Hole – Cemetery			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R118	High to Exceptional	Inside EIS boundary	R	R	NA	NA	NA	R
Lobs Hole – Recreation			Management and mitigation measures					

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Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
R55*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW
R70	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
R89*	Negligible	Inside EIS boundary	EW	EW	EW	EW	EW	EW

Table 116 A summary of impact mitigation measures for Marica.

Marica – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
MSU1/H3	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
MSU1/H6	Little	Within 20 m	R	NA	NA	NA	NA	NA
MSU4/H1	Little	Inside EIS boundary	NA	NA	R	NA	NA	NA
MSU8/H1	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
Marica – Mining items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
MSU1/H1	Moderate	Outside EIS boundary	NA	R	R	NA	NA	NA
MSU1/H2	Little to Moderate	Outside EIS boundary	NA	R	R	NA	NA	NA
MSU1/H4	Moderate	Outside EIS boundary	NA	R	R	NA	NA	NA
MSU1/H5	Little to Moderate	Within 20 m	R	R	R	NA	NA	NA

Table 117 A summary of impact mitigation measures for Gooandra Hill.

Gooandra Hill – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GHSU1/H3	Negligible	Outside EIS boundary	NA	NA	NA	NA	NA	NA
Gooandra Hill – Mining items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GHSU1/H2	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
GHSU7/H1	Little to Moderate	Outside EIS boundary	NA	NA	NA	NA	NA	NA
Gooandra Hill – SMA items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GHSU1/H1	Moderate	Outside EIS boundary	NA	NA	NA	NA	NA	NA
Gooandra Hill – Transport related items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GHSU1/H4	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
Gooandra Hill – Miscellaneous items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GHSU12/H1	Negligible	Within 20 m	R	NA	NA	NA	NA	NA
GHSU13/H1	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA

Table 118 A summary of impact mitigation measures for Kings Cross Road.

Kings Cross Road – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
KCSU2/H1	Little to Moderate	Outside EIS boundary	NA	NA	NA	NA	NA	NA
KCSU5/H1	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
KCSU7/H1	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
KCSU7/H2	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Kings Cross Road – SMA items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
KCSU7/H4	Little	Within 20m	NA	NA	R	NA	NA	NA
KCSU7/H5	Moderate	Within 20m	NA	NA	R	NA	NA	NA
KCSU7/H6	Little to Moderate	Within 20m	NA	NA	R	NA	NA	NA
KCSU7/H7	Little to Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
Kings Cross Road – Miscellaneous items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
KCSU7/H3	Negligible	Within 20m	NA	NA	NA	NA	NA	NA

Table 119 A summary of impact mitigation measures for Link Road.

Link Road – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
LSU5/H1	Little to Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
Link Road – Mining items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
LSU3/H1	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC9	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC18	Little to Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC19	Little to Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC24	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC93	High	Outside EIS boundary	NA	NA	R	NA	NA	NA
Link Road – Transport			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
LSU4/H1	Moderate	Within 20m	NA	NA	R	NA	NA	NA
LSU5/H2	Little	Inside EIS boundary	NA	NA	R	NA	NA	NA
NC1	Little to Moderate	Within 20m	NA	NA	R	NA	NA	NA
NC3	Little to Moderate	Within 20m	NA	NA	R	NA	NA	NA
NC4	Little to Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC8	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC16	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA

NC20	Little to Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA
NC21	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC22	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
NC23	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
Link Road – Miscellaneous			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
NC5	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC6	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC7	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC10	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC11	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC12	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC13	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC14	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC15	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA
NC17	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
NC26	Little to Moderate	Outside EIS boundary	NA	NA	NA	NA	NA	NA
LSU5/H3	Negligible	Outside EIS boundary	NA	NA	NA	NA	NA	NA
LSU5/H4	Little to Moderate	Outside EIS boundary	NA	NA	NA	NA	NA	NA
LSU5/H5	Little	Outside EIS boundary	NA	NA	NA	NA	NA	NA

Table 120 A summary of impact mitigation measures for Gooandra Fire Trail.

Gooandra Fire Trail – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GSU1/H1	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU1/H2	High	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU2/H1	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU6/H2	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU15/H3	Little	Within 20m	R	NA	R	NA	NA	NA
GSU15/H4	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU19/H1	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU22/H2	Little	Within 20m	R	NA	R	NA	NA	NA
Gooandra Fire Trail – Mining items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GSU4/H2	Moderate	Within 20m	R	NA	R	NA	NA	NA
GSU4/H3	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU4/H4	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU4/H5	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU4/H6	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU5/H2	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU6/H1	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU7/H1	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU7/H3	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU7/H5	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU7/H6	Moderate	Inside EIS boundary	NA	NA	R	NA	R	NA
GSU7/H7	Moderate	Within 20m	R	NA	R	NA	NA	NA
GSU7/H8	Moderate	Inside EIS boundary	NA	NA	R	NA	R	NA

GSU20/H1	Moderate to High	Within 20m	R	NA	R	NA	NA	NA
GSU22/H1	Moderate	Within 20m	R	NA	R	NA	NA	NA
GSU22/H4	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU22/H5	High to Exceptional	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU6M	High to Exceptional	Inside EIS boundary	NA	NA	R	NA	R	NA
Gooandra Fire Trail – Transport			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GSU1/H3	Little to Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA
GSU5/H1	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU7/H2	Little to Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU7/H4	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
GSU9/H1	Little to Moderate	Within 20m	R	NA	R	NA	NA	NA
GSU15/H1	Little to Moderate	Inside EIS boundary	NA	R	R	NA	NA	NA
GSU15/H2	Little to Moderate	Within 20m	R	NA	R	NA	NA	NA
GSU15/H5	Little to Moderate	Inside EIS boundary	NA	R	R	NA	NA	NA
GSU16/H1	Little to Moderate	Within 20m	R	NA	R	NA	NA	NA
GSU21/H2	Moderate	Inside EIS boundary	NA	R	R	NA	NA	NA
Gooandra Fire Trail – Miscellaneous			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
GSU3/H1	Negligible	Within 20m	NA	NA	NA	NA	NA	NA
GSU4/H1	Negligible	Within 20m	NA	NA	NA	NA	NA	NA

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GSU21/H1	Negligible	Outside EIS boundary	NA	NA	NA	NA	NA	NA
GSU22/H3	Negligible	Outside EIS boundary	NA	NA	NA	NA	NA	NA

Table 121 A summary of impact mitigation measures for Nungar Creek Fire Trail.

Nungar Creek Fire Trail – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
NSU3/H1	Moderate	Outside EIS boundary	NA	R	R	NA	NA	NA
NSU3/H2	Little	Within 20m	NA	R	R	NA	NA	NA
NSU4/H1	Little	Within 20m	NA	R	R	NA	NA	NA

Table 122 A summary of impact mitigation measures for Tantangara Dam Fire Trail.

Tantangara Fire Trail – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
TFTSU3/H1	Little	Outside EIS boundary	NA	R	R	NA	NA	NA
TFTSU4/H2	Little	Outside EIS boundary	NA	R	R	NA	NA	NA
Tantangara Fire Trail – Miscellaneous items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
TFTSU3/H2	Negligible	Outside EIS boundary	NA	R	R	NA	NA	NA

Table 123 A summary of impact mitigation measures for Tantangara Dam.

Tantangara Dam – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E2	Negligible	Inside EIS boundary	NA	NA	R	NA	NA	NA
E3	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
E6	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
E9	Negligible	Inside EIS boundary	NA	NA	R	NA	NA	NA
E19	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
TSU14/H1	Moderate to High	Inside EIS boundary	NA	R	R	NA	R	R
TSU14/H3	Negligible	Inside EIS boundary	NA	NA	R	NA	NA	NA
TSU15/H1	Moderate	Inside EIS boundary	NA	R	R	NA	R	R
TSU15/H2	Little to Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA
Tantangara Dam – SMA items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E4	Little to Moderate	Inside EIS boundary	NA	NA	R	NA	R	NA
E5	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
E11	Little	Inside EIS boundary	NA	NA	R	NA	NA	NA
E13	Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA
E18	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
Tantangara Dam Airstrip	Negligible	Inside EIS boundary	NA	NA	R	NA	NA	NA
Tantangara Dam Survey Camp	Negligible	Outside EIS boundary	NA	NA	R	NA	NA	NA
Tantangara Intake Structure	Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA

Tantangara Dam House	Little to Moderate	Within 20m	R	NA	R	NA	NA	NA
Tantangara Dam	High	Inside EIS boundary	NA	NA	R	NA	NA	NA
Weather Station	Moderate	Inside EIS boundary	NA	NA	R	NA	R	NA
Quarry	Moderate to High	Inside EIS boundary	NA	NA	R	NA	NA	NA
Tantangara Dam – Mining			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E7	Moderate	Outside EIS boundary	NA	R	R	NA	NA	R
E8	Little	Outside EIS boundary	NA	R	R	NA	NA	R
E10	Little	Inside EIS boundary	NA	R	R	NA	NA	R
E12	Little	Inside EIS boundary	NA	R	R	NA	NA	R
E15	Little	Outside EIS boundary	R	R	R	NA	NA	R
E16	Little	Outside EIS boundary	NA	R	R	NA	NA	R
E17	Little	Outside EIS boundary	R	R	R	NA	NA	R
E21	Little	Inside EIS boundary	NA	R	R	NA	NA	R
Tantangara Dam – Transport			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
TSU14/H2	Little to Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA
Tantangara Dam – Miscellaneous			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E1	Little	Inside EIS boundary	NA	NA	R	NA	NA	NA
E14	Little	Within 20m	NA	NA	NA	NA	NA	NA

Table 124 A summary of impact mitigation measures for Tantangara Road.

Tantangara Road – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E29	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E30	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E36	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E39	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E47	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E48	Little	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E53	Little to Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Tantangara Road – SMA items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E31	High	Within 20m	NA	NA	NA	NA	NA	NA
E37	Moderate	Within 20m	NA	NA	NA	NA	NA	NA
E38	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E40	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E41	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E42	Moderate to High	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E43	Moderate to High	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E44	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E45	High	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E46	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E55	Moderate	Within 20m	NA	NA	NA	NA	NA	NA
E56	Moderate to High	Within 20m	NA	NA	NA	NA	NA	NA
Tantangara Road – Mining			Management and mitigation measures					

Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E50	Little to Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E52	Little to Moderate	Within 20m	NA	NA	NA	NA	NA	NA
Tantangara Road – Transport			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E22	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E23	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E24	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E25	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E26	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E27	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E28	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E32	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E33	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E34	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E35	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E49	Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
E54	Moderate	Within 20m	NA	NA	NA	NA	NA	NA
Tantangara Road – Miscellaneous			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
E51	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA

Table 125 A summary of impact mitigation measures for Nungar Creek Trail.

Nungar Creek Trail – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
NCTSU2/H1	Moderate to High	Outside EIS boundary	NA	NA	R	NA	NA	NA
NCTSU2/H2	Little to Moderate	Within 20m	R	NA	R	NA	NA	NA
NCTSU9/H1	Little	Inside EIS boundary	NA	NA	R	NA	NA	NA
NCTSU16/H2	Little - Moderate	Within 20m	R	NA	R	NA	NA	NA
NCTSU23/H7	Little - Moderate	Within 20m	R	NA	R	NA	NA	NA
Nungar Creek Trail – Mining items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
NCTSU23/H1	Moderate	Inside EIS boundary	NA	R	R	NA	R	R
NCTSU23/H2	Moderate	Inside EIS boundary	NA	R	R	NA	R	R
NCTSU23/H3	Little to Moderate	Within 20m	R	R	R	NA	NA	NA
NCTSU23/H5	Moderate	Inside EIS boundary	NA	R	R	NA	R	R
NCTSU23/H6	Moderate	Inside EIS boundary	NA	R	R	NA	R	R
NCTSU24/H1	Moderate	Inside EIS boundary	NA	R	R	NA	R	R
Nungar Creek Trail – Transport			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
NCTSU16/H1	Little to Moderate -	Inside EIS boundary	NA	NA	NA	NA	NA	NA
NCTSU22/H1	Little to Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
NCTSU23/H4	Little to Moderate	Inside EIS boundary	NA	NA	NA	NA	NA	NA
Nungar Creek Trail – Miscellaneous			Management and mitigation measures					

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Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
NCTSU4/H1	Negligible	Within 20m	R	NA	NA	NA	NA	NA
NCTSU24/H2	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA

Table 126 A summary of impact mitigation measures for Rock Forest.

Rock Forest – Pastoral items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
CCSU1/H1	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
CCSU1/H2	Little	Outside EIS boundary	NA	NA	R	NA	NA	NA
CCSU1/H3	Little - Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
CCSU1/H4	Little - Moderate	Inside EIS boundary	NA	NA	R	NA	NA	NA
CCSU1/H5	Little - Moderate	Inside EIS boundary	NA	NA	R	R	NA	NA
Rock Forest – Mining items			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
CCSU3/H1	Little	Inside EIS boundary	NA	NA	R	NA	NA	NA
Nungar Creek Trail – Agriculture			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
CCSU9/H1	Moderate	Outside EIS boundary	NA	NA	R	NA	NA	NA
Nungar Creek Trail – Miscellaneous			Management and mitigation measures					
Item	Contributory Significance	Expected Impacts	No-go fencing	Archival research	Archival recording	Salvage moveable heritage	Test/salvage excavation	Interpretation Plan
CCSU1/H6	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
CCSU1/H7	Negligible	Inside EIS boundary	NA	NA	NA	NA	NA	NA
CCSU8/H1	Negligible	Outside EIS boundary	NA	NA	NA	NA	NA	NA

11. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

11.1 OVERVIEW

The project is within the listed boundaries of two national heritage places:

- *Australian Alps National Parks and Reserves* (AANP) – Place ID 05891, and
- *The Snowy Mountains Scheme* (SMS) – Place ID 105919.

National heritage places are protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and are deemed matters of national environmental significance (MNES) under the EPBC Act. The project SEARs issued on 31 July 2019 stipulate requirements for heritage in Table 1 that relate to MNES. This chapter assesses the project impacts to MNES relating to the listed heritage values of the AANP and SMS. It also assesses the project impacts to the cultural values of the Kosciuszko National Park (KNP) which, although not registered on the national heritage list individually, is one of the 11 national parks and reserves that comprise the AANP.

11.2 OVERVIEW OF LISTINGS AND VALUES

11.2.1 Australian Alps National Parks and Reserves

The AANP is the mountainous bioregion that extends over NSW, ACT and Victoria. The project is wholly within the boundaries of the listed place, except for Rock Forest which directly borders part of the place's eastern boundary.

The AANP has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural and cultural history. The AANP is part of a unique Australian mountainous region. Human interaction with the region has been distinctive in its response to the challenges and opportunities presented by the unique environment (Commonwealth of Australia Gazette 7 Nov. 2008).

The key components of the AANP national environmental significance are presented below (Australian Heritage Database, n.d.):

- The natural landscapes of the AANP contain extremely restricted alpine and sub-alpine environments and flora and fauna species. It contains a suite of glacial and periglacial features and plateaus and peaks that are prominent and unparalleled in Australia. The AANP contains most of the continental peaks over 1,700 metres, all those over 1,900 metres and experiences extensive snow coverage on a seasonal basis.

- The AANP provides a vital refuge for alpine and sub-alpine flora and fauna species with a high level of richness and endemism across a wide range of taxa. During the late Quaternary and into the present, the high-altitude, cold climate environment has provided refuge for species in an increasingly arid environment. The AANP contains most of the contiguous montane to alpine environments in Australia and supports a rich and unique assemblage of cold-climate specialist species.
- The cold-climate, high-altitude history of the AANP is expressed in the assemblage of glacial deposits and features which are unique in low-latitude, low-altitude Australia. These include five alpine lakes, thirteen cirques and associated moraines, ice-grooved and polished pavements and erratic boulders. Periglacial features include block streams, permafrost and solifluction deposits. These contribute to our understanding of the nature of landscape response to climate during the ice ages of the late Quaternary and into the present.
- The Mt Howitt fish fossil site contains remarkable fossil diversity and preserves fish fossils across a range of life stages. The site contributes to the narrative about the evolution of fish across a number of marine and freshwater environments, and the development of features that enabled vertebrates to leave the water to exploit terrestrial environments for the first time. They have outstanding heritage value to the nation for their place in vertebrate evolution during the 'Age of Fish'.
- It is the only region in mainland Australia with seasonal snow cover and hence the Australian Alps strongly influence the hydrology of eastern Australia. The Alps contribute significant snow melt to the rivers of eastern Australia and the water retention properties of the bog and fen communities in the AANP play an integral role in regulating water flow to river systems.
- The AANP provides an outstanding example of the adaptability of the genus *Eucalyptus* which dominates the vegetation from the lowland to the alpine areas. Much of the highest land in Australia occurs in the AANP which demonstrates very large topographic variation which is reflected in the high diversity of *Eucalypts* along the altitudinal and climatic gradient.
- The AANP contains the Indigenous history of moth feasting which involved the adult insect – the Bogong moth – as the basis for past large-scale annual gatherings of different Aboriginal groups for ceremonies sets the gatherings in the AANP apart from other Aboriginal ceremonial gatherings and has captured the Australian imagination, making it exceptional in Australia.
- The AANP has outstanding heritage value for its association with historic transhumant grazing that commenced in the 1830s. The practice of using alpine high plains to graze stock during the summer months was a significant pastoral activity of the nineteenth and twentieth centuries and was continuously practiced for a period of over 150 years; making a considerable contribution to

the early pastoral industry of south-east Australia. Transhumant grazing created and sustained a distinctive way of life that is valued as an important part of Australia's pioneering history and culture. Evidence of transhumant grazing includes huts, the former grazing landscapes, stock yards and stock routes.

- The AANP has outstanding heritage value for the scientific research that has taken place since the 1830s, demonstrated by the density and continuity of scientific endeavour. Research sites within the AANP include those relating to botanical surveys, soil conservation enclosures, karst research, fauna research, meteorology, fire ecology plots, arboreta and glacial research sites. Space tracking undertaken in the ACT with Honeysuckle Creek Tracking Station having played a significant role in the Apollo 11 moon landing mission.
- The AANP has outstanding heritage value for the longevity and diversity of its recreational use. Snow sports commenced in Kiandra in 1861 with the establishment of the Kiandra Snowshoe Club and expanded from an *ad hoc* activity by enthusiasts to a multi-million-dollar snow sport and tourism industry characterised by the groomed ski slopes, ski lift infrastructure and substantial village resorts. The chalets supported by government were major features of the expanding activity and were established in scenic locations in the early twentieth century when mountain retreats were highly regarded for good health. These include the Mount Buffalo Chalet, the Yarrangobilly Caves House Precinct, the Chalet at Charlottes Pass, and the former Hotel Kosciusko and Mount Franklin Chalets.
- Water harvesting in the AANP has outstanding heritage value to the nation for its contribution to the social and economic development of Australia. Water harvested from headwaters in the AANP contributes to the water needs of Canberra and Melbourne. The Snowy Mountains Hydro-electric Scheme and the Kiewa Valley Hydro-electric Scheme also contributes to the electricity needs of south-eastern Australia. Both schemes were major post-war reconstruction projects, encouraging migration to Australia and employing over 60,000 displaced persons from post war Europe. Evidence of water harvesting in the AANP for power and irrigation includes the major pondages along with the numerous tunnels, aqueducts, power stations, huts, roads and former settlements, town and work camp sites.
- The North-East Kosciuszko pastoral landscape demonstrates the use of mountain resources, namely the summer grasses and herbfields. As a relict landscape of past grazing leases, it conveys the principal characteristics of transhumance and permanent pastoralism in a remote environment, these being large areas of open grassy landscapes between timbered ridges and hills, stockman's huts, homestead complexes, stockyards and stock routes. The grasslands with swathes of pioneer shrubs include the Kiandra landscape, Boggy Plain, Nungar Plain, Gulf Plain, Wild Horse Plain, Tantangara Plain,

Dairymans Plain, Currango Plain, Long Plain, Cooleman Plain, Kellys Plain, Blanket Plain, Peppercorn and Pockets Saddle.

- The Australian Alps have a special association with the Australian community because of their unique landscapes, the possibility of experiencing remoteness and as the only opportunity for broad-scale snow recreation in Australia. The AANP is widely recognised by Australians as the 'high country' and many community groups have a special association with the AANP for social and cultural reasons.
- Mount Kosciuszko is an iconic feature for all Australians and visited by over 100,000 people each year. It was named by the explorer Paul Edmund Strzelecki after the Polish freedom fighter, General Tadeusz Kosciuszko, in appreciation of freedom and a free people, an association that is highly valued by Australia's Polish community.
- The pioneering history of the high country is valued as an important part of the construction of the Australian identity featuring in myths, legends and literature. The ballad of The Man from Snowy River epitomises horsemanship undertaken historically in the rugged landscape. The stories, legends and myths of the mountains and mountain lifestyles have been romanticised in books, films, songs, and television series and many such as the Elyne Mitchell's Silver Brumby novels are part of Australia's national identity.
- The mountain huts of the AANP constructed for grazing, mining and recreation are valued by communities as a physical expression of the cultural history of the region. They have special associations with many groups, such as mountain cattlemen, skiers and bushwalkers but particularly with huts associations that have been maintaining mountain huts and associated vernacular building skills for over 30 years.
- Baron Ferdinand von Mueller is highly recognised nationally and internationally for his contribution to Australian botany, particularly his extensive and thorough botanical collections of the Australian Alps undertaken in several botanical collecting trips on horseback, each of several weeks' or months' duration (Costin et al. 1979).
- Eugen von Guerard was a significant nineteenth century artist producing a prolific record of Australian landscapes. His 1863 painting the *North-east view from the northern top of Mount Kosciusko* is regarded as one of his finest artistically and is in Australia's national collection.
- Through his ballad *The Man from Snowy River*, Andrew Barton 'Banjo' Paterson captured the imagination of the Australian people, stimulating a passion for the High Country and the way of life associated with the mountains. His iconic ballad has had a lasting influence on Australians.

- The writer Elyne Mitchell and poet David Campbell lived near the mountains and their strong association with the place is expressed in much of their nationally important literary works.

11.2.2 Snowy Mountains Scheme

The Snowy Mountains Hydro-electric Scheme (Snowy Scheme) was established by the Commonwealth in July 1949. The first power project within the scheme commenced operation in 1955 and the works were largely completed by 1974. The Snowy Scheme was and remains one of the largest engineering and construction projects in the world. The scheme consists of a network of reservoirs, tunnels, pipes and power stations in the Snowy Mountains of New South Wales. It is the largest public works engineering scheme ever undertaken in Australia. It is nationally significant for its engineering success and as a symbol of Australian achievement (Commonwealth of Australia Gazette 14 October 2016).

In this section an overview is presented of what the key components of the national environmental significance of the Snowy Mountain Scheme is understood to be (Australian Heritage Database, n.d.). As this is a summary from the Australian Heritage Database, it is presented in point form:

- The Snowy Mountains Scheme is an unprecedented civil engineering project stimulated by the will of the post-World War II Commonwealth Government to build a strong Australian economy. The scheme is the most significant project to be undertaken as part of the Post-war Reconstruction program and has become an enduring symbol of Australia's identity as a multicultural, independent and resourceful country.
- The Snowy Mountains Scheme was a major impetus in the development of Australia's engineering expertise and industrial relations environment in the post-war period. The Snowy Mountains Scheme resulted in the development of innovative engineering technology and features that have been adopted as standard practices world-wide, such as the use of rock bolting to strengthen tunnel roofs.
- In the post-World War II period, Australia was asked by the United Nations to accept 100,000 displaced Europeans. The Snowy Mountains Scheme was central to this process with over 100,000 people employed from thirty different countries, including approximately 60,000 European Displaced Persons and migrants employed directly by the Snowy Mountains Authority.
- The vast workforce that was required to build the Snowy Mountains Scheme required new management practices and the mechanisms implemented by Sir William Hudson permanently changed the nature of industrial relations and workplace conditions in Australia.
- The Snowy Mountains Scheme was hailed as a model of multicultural co-operation and integration and provided the opportunity for thousands of migrants to start a new life after the impacts of the war. The majority of those

who came to build the Scheme stayed, becoming Australian citizens. The *New Australians*, with their energy and enterprise, would change Australia's social and cultural skyline forever.

- The Snowy Mountains Scheme is a symbol of Australian achievement and is significant to the nation as the most important single development project related to the Commonwealth's post-war reconstruction program and the effort to build a new and strong nation.
- The Snowy Mountains Scheme is a rare example of an engineering program of enormous complexity and scale. Apart from the sheer scale of the site, the Snowy Mountains Scheme also has rare engineering features, such as underground power stations, very large earth-filled dams, and two examples of pumped storage capacity, using off-peak power to top-up supply reservoirs, which are the only known examples of their type in Australia.
- The Snowy Mountains Scheme is an exemplar as a currently operating, intact hydro-electric scheme that is the largest and most complex example of such schemes in Australia. The Scheme is comprised of significant and well-maintained components such as dams, power stations, aqueducts and an extensive tunnel system.
- The Snowy Mountains Scheme retains all the characteristics of a complex hydro-electric and irrigation scheme with a very high degree of integrity. The technology and features that were used to construct the Snowy Mountains Scheme demonstrate the principal characteristics of a dual hydro-electric and irrigation scheme, with each component an excellent and representative example of its type.
- The Snowy Mountains Scheme is widely regarded as one of the engineering wonders of the world. The Snowy Mountains Scheme is a major engineering feat that is recognised for its technical excellence and innovation. Because many techniques, including some that were developed specifically for the Scheme had not been used in Australia before, the project had enormous impact on the development in Australia of surveying, hydrology, electrical and civil engineering and construction techniques.
- The Scheme is significant for the association with Sir William Hudson and Olav Olsen. Hudson, the 'Father of the Snowy', was Commissioner of the Snowy Mountains Authority from 1949-67 and was instrumental in the success of the Scheme as well as the introduction of revolutionary work practices in Australia.
- Olsen was originally on the Hydro-electric Sub-committee of the Commonwealth-States Technical Committee and was then employed as the Chief Investigating Engineer for the Snowy Mountain Authority. Olsen is credited for the design of many of the innovative practices in engineering that were developed during for the scheme, as well as the general conception of the Snowy Mountains Scheme as a dual irrigation and hydro-electric facility.

11.2.3 Kosciuszko National Park

Kosciuszko National Park is a special place. It contains the highest mountains on the Australian continent, unique glacial landscapes, and unusual assemblages of plants and animals, a number of which are found nowhere else. It also encompasses significant water catchments, the principal seasonally snow-covered region in Australia, and extensive tracts of forest and woodland in the most densely populated corner of the nation. Layers of cultural remains, histories and meanings are superimposed on all of this country (KNP PoM 2016).

The landscapes of KNP contain a rich legacy of previous human occupation, use and modification. Aboriginal people, European explorers and surveyors, graziers, prospectors, miners, timber workers, scientists, construction workers, soil conservationists and recreationists have all left tangible evidence of their presence. This includes stone artefact scatters, campsites and ceremonial grounds, town and mine sites, huts and fence lines, networks of roads and tracks, power stations, dams, tunnels, aqueducts and ski resort infrastructure. Their endeavours have also created a rich legacy of stories, memories, experiences and meanings, strands of which have been recorded in literature, paintings, photographs, songs and place names (KNP PoM 2016).

The cultural heritage of the park encompasses many places and themes. It contains a large number of heritage sites, structures and artefacts and intangible values, some of which are recognised and celebrated nationally, while others are significant to particular groups, communities, families or individuals.

The park is highly significant for descendants of Aboriginal people with traditional and historical links to the mountains. Scientific evidence indicates a long history of Aboriginal use and occupation and demonstrates successful adaptations to extreme environmental conditions.

The pastoral theme associated with the park represents a high country variation characterised by transhumance, unique within Australia to the Australian Alps and the Central Plateau of Tasmania. The collection of huts in the park probably comprises the largest group of different types and purposes of huts in any comparable area in Australia. Individually, and as a group in their landscape setting, they have considerable historic, social and aesthetic significance. The mining theme, as represented in the park, has national significance as part of a landmark period of Australian history. The complex of mine sites illustrates adaptations to mining practices and living conditions necessitated by working in places seasonally covered by snow. The water harvesting theme in the park spans more than a century and ranges from the various dams and race lines constructed for early mining operations to the Snowy Mountains Hydro-electric Scheme, the largest engineering project ever undertaken in Australia. Scientific research work conducted in the park encompasses pioneering research in anthropology, botany, ecology, geology,

geomorphology, hydrology and meteorology. The efforts that culminated in the creation of Kosciuszko National Park are of national significance in that they mark the rise of the conservation movement at a nationwide level. Government built infrastructure, such as Kosciuszko Road and the chalets at Charlotte Pass and Diggers Creek, and the Yarrangobilly Caves complex reflects an early phase in mountain tourism. Kiandra has special significance as the first place in Australia where recreational skiing was undertaken, and elements of the existing skifields and ski resorts reflect important social and recreational movements (KNP PoM 2016).

11.3 IMPACT ASSESSMENT

11.3.1 Impact Assessment Framework

The impact assessment undertaken for the National Heritage places that are MNES has been guided by the Commonwealth of Australia document *Matters of National Environmental Significance. Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 Australian Government Department of the Environment* (2013).

Once a heritage place is listed under the EPBC Act, special requirements come into force to ensure that the values of the place will be protected and conserved for future generations. Approval under the EPBC Act is required for any action occurring within, or outside, a National Heritage place that has, will have, or is likely to have a significant impact on the National Heritage values of the National Heritage place. A 'significant impact' is defined as an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. It is important to consider these factors when determining whether an action is likely to have a significant impact on MNES.

A significant impact is deemed to be 'likely' if a significant impact on the environment is a real or not remote chance or possibility. However, if there is scientific uncertainty about the impacts and potential impacts are serious or irreversible, the precautionary principle is applicable. The precautionary principle is that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage. Accordingly, a lack of scientific certainty about the potential impacts of an action will not itself justify a decision that the proposed action is not likely to have a significant impact on the environment.

An action is likely to have a significant impact on the National Heritage values of a National Heritage place if there is a real chance or possibility that it will cause:

- o one or more of the National Heritage values to be lost;
- o one or more of the National Heritage values to be degraded or damaged; or
- o one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

If an action will, or is likely to, have a significant impact on any MNES, the Commonwealth Minister for the Environment or the Minister's delegate will determine that it is a 'controlled action' and requires approval. To determine whether a proposed action will or is likely to be a controlled action, a Referral of Proposed Action is submitted to the Commonwealth Department of the Environment and Energy (DoEE) for assessment.

A Referral of Proposed Action was submitted to DEE on 21 October 2018 for the project. The referral nominated that the project had the potential to have a significant impact on the nominated National Heritage places although the level of impact was not determined at the time of lodgement. DoEE determined that the project is a controlled action on 5 December 2019 under the controlling provisions of: National Heritage places, listed threatened species, listed migratory species and Commonwealth action. The following impact assessment addresses impacts to the National Heritage places AANP and SMS.

11.3.2 Potential Sources of Impact

The project has several elements that will result in direct impacts within the AANP and SMS National Heritage listing boundaries. Details about the project design and elements are provided in Section 2 of this report. The following list provides an overview of the project elements that have potential to impact the National Heritage values of the AANP and SMS.

In general terms, the project components that have potential to impact National Heritage values comprise:

- o permanent infrastructure (eg access roads and tunnel portals);
- o temporary infrastructure (eg accommodation camps and construction compounds);
- o the project disturbance area (ie ground disturbance required for construction works);
- o excavated rock management (eg spoil placement and its location); and
- o rehabilitation strategies for areas disturbed during construction.

This section discusses each official value criterion and how the project may impact that value. Some values are listed under multiple criteria and therefore multiple responses to impacts and management are provided.

In this section the management or mitigation measures employed to minimise impacts to the official values, including any positive contributions to KNP are outlined. Depending on the extent of mitigation required, this may include a summary of the measures with a cross-reference to the relevant study or is wholly contained within the tables.

11.3.3 Impact Assessment AANP

The table below presents the impact assessment for the project on the AANP. The impact assessment has been guided by the criteria for significant impacts for National Heritage places set out in the MNES significant impact guidelines (Commonwealth of Australia 2013).

Table 127 Impact Assessment – *Australian Alps National Parks and Reserves.*

Item	Official values	Impact assessment and proposed management and mitigation
Criterion A Events Processes		
	<p>Glacial and Periglacial Features The assemblage of glacial deposits and features in the AANP includes five alpine lakes, thirteen cirques and associated moraines, ice-grooved and polished pavements and erratic boulders. Periglacial features, both fossil and modern, include block streams, permafrost and solifluction deposits. These features are the material expression of the cold-climate, high-altitude history of the AANP, unique in the low-latitude, low-altitude Australian continent. The glacial and periglacial features contribute uniquely to our understanding of the nature of landscape response to climate during the ice ages of the late Quaternary and into the present and therefore has outstanding heritage value to the nation for its importance in the pattern of Australia's natural history (Percival 1985; Galloway 1989; Yeates 2001a; ISC 2004; AALC 2006).</p>	<p>The proposed works will impact on five periglacial block streams through roadworks on Lobs Hole Ravine Road in the Ravine area of KNP. Block streams are linear deposits of boulders and cobbles, formed where periglacial conditions have promoted the frost-induced fracture of bedrock outcrops and subsequent en masse down-slope movement of the coarse rock debris under the influence of interstitial ice (Wilson 2007).</p> <p>The Cenozoic Geodiversity Assessment detailed the significance and potential for impacts to these features (Troedson 2019). This report found that the Ravine block streams have significance for their cultural value due to their potential use in geo-tourism and earth science education. They are part of the story of the ice age heritage of the park, a spectacular example of the effects of periglacial processes, and a prominent testament to late Quaternary climate change. Of additional interest are the visible ridges on the surface of Block Stream B which can be inferred to relate to ice age depositional processes. Intermittent views of the block streams can be obtained at various points on Lobs Hole Ravine Road.</p> <p>These block streams are bisected by the existing Lobs Hole Ravine Road and would be impacted further by the proposed road upgrades. A proposed 80 m wide road corridor has been identified as the maximum extent of impact to the Ravine boulder streams. The proposed works are expected to negatively impact the boulder streams through the permanent removal and covering of boulders by the proposed roadworks. The extent of periglacial block streams in this area was mapped as part of the Cenozoic Geodiversity Assessment which demonstrated that even with the maximum impact occurring a significant extent of</p>

Item	Official values	Impact assessment and proposed management and mitigation
		<p>boulder streams would remain present in the Ravine area. The Cenozoic Geodiversity Assessment also identified several additional sites where undocumented periglacial features are likely to occur in the northern section of KNP.</p> <p>To manage the potential impacts to the Ravine block streams several management measures are proposed and are detailed in Section 4.3 of the Cenozoic Geodiversity Report. Measures to be implemented to minimise impacts to the Ravine block streams include selection of construction methods that minimise the road footprint and the visual impacts of the works during detailed design as well as additional field mapping and regular monitoring of block streams during construction. In addition, measures have been identified to enhance the geotourism potential of the block streams by providing a nearby stopping bay and educational signage.</p> <p>It is expected that the Ravine block streams will be directly impacted by the proposed road works, but that they will maintain their potential to contribute to our understanding of the nature of landscape response to climate during the ice ages of the late Quaternary. The design of the works and implementation of proposed mitigation measures will ensure that the Ravine block streams maintain and enhance their values as spectacular landscape features that demonstrate glacial and periglacial processes and patterns in Australia's natural history. Therefore the proposed works will not diminish the geoheritage values of the Ravine block streams and with the implementation of the proposed mitigation measures wi Snowy 2.0 Main Works will impact on five periglacial block streams through roadworks on Lobs Hole Ravine Road in the Ravine area of KNP. Block streams are linear deposits of boulders and cobbles, formed where periglacial conditions have promoted the frost-induced fracture of bedrock outcrops and subsequent en</p>

Item	Official values	Impact assessment and proposed management and mitigation
		<p>masse down-slope movement of the coarse rock debris under the influence of interstitial ice (Wilson 2007).</p> <p>The Cenozoic geodiversity assessment detailed the significance and potential for impacts to these features (Appendix O.2). This report found that the Ravine block streams have significance for their cultural value due to their potential use in geo-tourism and earth science education. They are part of the story of the ice age heritage of the park, a spectacular example of the effects of periglacial processes, and a prominent testament to late Quaternary climate change. Of additional interest are the visible ridges on the surface of Block Stream B which can be inferred to relate to ice age depositional processes. Intermittent views of the block streams can be obtained at various points on Lobs Hole Ravine Road.</p> <p>These block streams are bisected by the existing Lobs Hole Ravine Road and would be impacted further by project road upgrades. A proposed 80 m wide road corridor has been identified as the maximum extent of impact to the Ravine boulder streams. Snowy 2.0 Main Works are expected to negatively impact the boulder streams through the permanent removal and covering of boulders by the proposed roadworks. The extent of periglacial block streams in this area was mapped as part of the Cenozoic geodiversity assessment which demonstrated that even with the maximum impact occurring a significant extent of boulder streams would remain present in the Ravine area. The Cenozoic geodiversity assessment also identified several additional sites where undocumented periglacial features are likely to occur in the northern section of KNP.</p> <p>To manage the potential impacts to the Ravine block streams several management measures are proposed and are detailed in Section 4.3 of the Cenozoic geodiversity assessment. Measures</p>

Item	Official values	Impact assessment and proposed management and mitigation
		<p>to be implemented to minimise impacts to the Ravine block streams include selection of construction methods that minimise the road footprint and the visual impacts of the works during detailed design as well as additional field mapping and regular monitoring of block streams during construction. In addition, measures have been identified to enhance the geo-tourism potential of the block streams by providing a nearby stopping bay and educational signage.</p> <p>It is expected that the Ravine block streams will be directly impacted by project road works, but that they will maintain their potential to contribute to our understanding of the nature of landscape response to climate during the ice ages of the late Quaternary. The design of the project road works, and implementation of proposed mitigation measures will ensure that the Ravine block streams maintain and enhance their values as spectacular landscape features that demonstrate glacial and periglacial processes and patterns in Australia's natural history. Therefore, Snowy 2.0 Main Works will not diminish the geoheritage values of the Ravine block streams and with the implementation of the proposed mitigation measures will enhance their geodiversity and geo-tourism potential.</p>
	<p>Fossils The Mt Howitt fish fossil site demonstrates remarkable fossil species diversity and preserves fish fossils across a wide range of life stages from larvae to mature fish, over tens of millions of years. The site contributes an important narrative about the evolution of fish across a number of different marine and freshwater environments, and the development of features that enabled vertebrates to leave the water to exploit terrestrial environments for the first time. Fossils revealed at the site have outstanding heritage value to the nation for their place in vertebrate</p>	<p><i>Not applicable – relates Mt. Howitt fish fossil site which will not be affected by the project.</i></p>

Item	Official values	Impact assessment and proposed management and mitigation
	evolution during the so-called 'Age of Fish' (Vickers-Rich and Rich 1993; Cook ed. 2007).	
	<p>Karst</p> <p>The Yarrangobilly karst area contains an outstanding collection of surface karst features including gorges, arches, blind valleys, springs and pinnacle fields. It also contains several hundred caves including six show caves with many intricate cave decorations, open for public viewing (ISC 2004). Yarrangobilly has yielded valuable information on the long-term dynamics of landscape formation. The thick flowstone sequences in Jersey Cave span half a million years and provide the longest continuous fire history record from a single site in Australia (DEH 2006b). Yarrangobilly has outstanding value to the nation for its features and karst processes evident in the limestone karst landscape.</p>	<p>The potential for impacts to Karst features in the Snowy 2.0 Main Works project area were addressed in the Paleozoic geodiversity report (Appendix O.1). The report found that no features of the Yarrangobilly karst area will be impacted by the project. No direct construction impacts will occur as all construction works are remote from the Yarrangobilly karst area.</p> <p>The Paleozoic geodiversity report also identified that of particular importance to karst sites is the preservation of the existing hydrology regime. As documented in the Snowy 2.0 Main Works water assessment (Appendix J) it is considered highly unlikely that the proposed tunnelling and excavation works would result in any hydrology impacts in the Yarrangobilly karst area.</p> <p>Therefore, the project is not expected to impact on karst features of the Yarrangobilly Karst area or their value to the nation for its features and karst processes evident in the limestone karst landscape.</p>
	<p>Biological Heritage</p> <p>The Alps are one of eleven sites recognised in Australia by the IUCN as a major world centre of plant diversity. During the late Quaternary and into the present, the high-altitude, cold-climate environment has provided refuge for species in an increasingly arid climate. Containing most of the contiguous montane to alpine environments in Australia, the AANP supports a rich and unique assemblage of cold-climate specialist species that have evolved unique physiological characteristics, enabling them to survive in an environment subject to extreme climate variation. Outstandingly rich flora taxa in the</p>	<p>The relevant species listed under the biological heritage values which were recorded within and adjacent to project area include Alpine She-oak Sink, Mauve Burr-daisy (<i>Calotis glandulosa</i>), Max Mueller's Burr-daisy (<i>Calotis pubescens</i>), <i>Prasophyllum innubum</i>, Kiandra Leek Orchid (<i>Prasophyllum retroflexum</i>), <i>Pterostylis alpina</i> and Slender Greenhood (<i>Pterostylis foliata</i>).</p> <p>Additionally, extensive surveys have resulted in an increased knowledge of the critically endangered Smokey Mouse. The species was only previously recorded three times within KNP. Following remote surveys, the species is now known from 70 locations within KNP. These surveys have significantly expanded the species known distribution within KNP.</p>

Item	Official values	Impact assessment and proposed management and mitigation
	<p>AANP include the daisies (Asteraceae), willow-herbs (Onagraceae), starworts and cushion-plants (Caryophyllaceae), southern heaths (Epacris), bottlebrushes (Callistemon), orchids (Pterostylis, Prasophyllum and Dipodium) and pimeleas (Thymaelaeaceae). Cold-climate adapted and endemic fauna species include the mountain pygmy-possum (Burramys parvus), the alpine she-oak skink (Cyclodomorphus praealtus), Snowy Mountains rock skink (Egernia guthega), Baw Baw frog (Philoria frosti), southern corroboree frog (Pseudophryne corroboree), and the northern corroboree frog (P. pengilleyi). Species of a great many invertebrate taxa are endemic to the Alps. These include stoneflies, caddisflies, mayflies, grasshoppers, and earthworms. Many display cold-climate adaptations, such as the mountain grasshopper (Acripeza reticulata), mountain spotted grasshopper (Monistria concinna) and alpine thermocolour grasshopper (Kosciuscola tristis). The Bogong moth undertakes regular migration in Australia and an essential part of its lifecycle occurs within the AANP. The AANP is a vital refuge for alpine and sub-alpine flora and fauna species, with a high level of richness and endemism across a wide range of taxa, and therefore has outstanding value to the nation for encompassing a significant and unique component of Australia's biological heritage (Nankin 1983; Costin 1989; Strahan 1995; Good 1995; Boden and Given 1995; WWF and IUCN 1995; Cogger 1996; Crabb 2003 Good 2003; ISC 2004; DSE 2005; AALC 2005; DEC 2006; McDougall & Walsh 2007, ANHAT 2007).</p>	<p>Providing further information around associated vegetation communities and altitudinal preference.</p> <p>For further detailed assessment on threatened flora and fauna within the KNP, please refer to the biodiversity assessment development report (Appendix M.1).</p> <p>Mitigations for project-related impacts include credit species offsets which will apply to affected species, weed protocols to ensure no introduced species will result from the project, and the prevention of the spread of existing exotic species.</p>
	<p>Moth Feasting The use of an adult insect – the Bogong moth – as the basis for past large-scale annual gatherings of different</p>	<p>The areas associated with moth feasting are relatively place specific and refer to travel routes, ceremonial places and rock tors that host bogong moths. The Kiandra Plateau would have</p>

Item	Official values	Impact assessment and proposed management and mitigation
	<p>Aboriginal groups for ceremonies sets the gatherings in the AANP apart from other Aboriginal ceremonial gatherings and has captured the Australian imagination, making it exceptional in Australia (White 2006). Therefore, the AANP has outstanding heritage value to the nation because of the importance of Aboriginal social gatherings based on moth feasting in the course, or pattern, of Australia's cultural history</p>	<p>been traversed by people making their way between important localities such as the Bogong Mountains to the north and Jagungal in the south that were associated with moth feasting and ceremonies (Knight 2009). Moth feasting localities such as rocky tors are, however, generally absent from the project area. The exception is a large rock shelter site at Tantangara which is near to but nevertheless outside the project footprint. Impacts to the Kiandra Plateau in which travel would have occurred will include road access (most of which currently exists) and the installation of communication cabling within existing road corridors. Such impacts to the landscape can be considered minor and certainly visually insignificant. Impacts would not occur to known moth feasting locales or areas associated with moth feasting ritual activity. Therefore, no moth feasting places, or areas associated with moth feasting will be impacted as a result of the proposed action. The proposed action will not cause a significant impact to the National Heritage values of moth feasting in the AANP.</p>
	<p>Transhumant Grazing The AANP has outstanding heritage value for its association with historic transhumant grazing that commenced in the 1830s. The practice of using alpine high plains to graze stock during the summer months was a significant pastoral activity of the nineteenth and twentieth centuries and was continuously practised for a period of over 150 years; making a considerable contribution to the early pastoral industry of south east Australia. Transhumant grazing created and sustained a distinctive way of life that is valued as an important part of Australia's pioneering history and culture. Evidence of transhumant grazing includes huts, the former grazing landscapes, stock yards, and stock routes.</p>	<p>All areas in which impacts would occur, including Talbingo, Lobs Hole, Marica, the Plateau and Tantangara were used in the past for transhumant grazing. The evidence of transhumant grazing including huts, stock yards and stock routes occur within the general area of the disturbance area, however, the primary evidence is old stock fences lines, many of which occur within the project footprint. No huts or stock yards occur within the disturbance area. The impact assessment as presented in Section 9 of this report has determined that impacts to stock fences range from negligible or little in most instances, to moderate in a few. In order to minimize impacts to the official value of transhumant grazing, management and mitigation measures have been proposed as set out in Section 10. These include measures such as minimizing impacts as much as possible, the</p>

Item	Official values	Impact assessment and proposed management and mitigation
		establishment of no-go zones, archival research and archival recording. The proposed action will not cause a significant impact to the National Heritage values of transhumant grazing in the AANP.
	Scientific Research The AANP has outstanding heritage value for the scientific research that has taken place since the 1830s, demonstrated by the density and continuity of scientific endeavour. Research sites within the AANP include those relating to botanical surveys, soil conservation enclosures, karst research, fauna research, meteorology, fire ecology plots, arboreta and glacial research sites. Space tracking undertaken in the ACT with Honeysuckle Creek Tracking Station having played a significant role in the Apollo 11 moon landing mission.	The additional scientific research that has been completed for the Snowy 2.0 project (Exploratory Works and Main Works) will constitute a positive impact which will be built upon subsequent to project approval. This includes significant ecological findings (eg endangered Smoky Mouse and bogs and fens), additional investigation into geodiversity and its public accessibility and interpretation, and increased evidence of Aboriginal and historical occupation of the KNP.
	Water Harvesting Water harvesting in the AANP has outstanding heritage value to the nation for its contribution to the social and economic development of Australia. Water harvested from headwaters in the AANP contributes to the water needs of Canberra and Melbourne. The Snowy Mountains Hydro-electric Scheme and the Kiewa Valley Hydro-electric Scheme also contributes to the electricity needs of south-eastern Australia. Both schemes were major post-war reconstruction projects, encouraging migration to Australia and employing over 60,000 displaced persons from post war Europe. Evidence of water harvesting in the AANP for power and irrigation includes the major pondages along with the numerous tunnels, aqueducts, power stations, huts, roads and former settlements, town and work camp sites.	The project is based on a water recycling system and accordingly, any potential net loss in the water harvesting scheme is considered negligible. The proposed impacts would have a neutral impact on the water harvesting values of the AANP. In regard to the use of water for the production of electricity, the project rationale is to significantly increase the electricity generating capacity of the Snowy scheme. The proposed action will not cause a significant impact to the National Heritage values of water harvesting in the AANP.
	Recreation	Potential impacts to recreational values of KNP are documented in TRC Tourism (2019, Appendix Y). The listed

Item	Official values	Impact assessment and proposed management and mitigation
	The AANP has outstanding heritage value for the longevity and diversity of its recreational use. Snow sports commenced in Kiandra in 1861 with the establishment of the Kiandra Snowshoe Club and expanded from an ad hoc activity by enthusiasts to a multi-million dollar snow sport and tourism industry characterised by the groomed ski slopes, ski lift infrastructure and substantial village resorts. The chalets supported by government were major features of the expanding activity and were established in scenic locations in the early twentieth century when mountain retreats were highly regarded for good health. These include the Mount Buffalo Chalet, the Yarrangobilly Caves House Precinct, the Chalet at Charlottes Pass, and the former Hotel Kosciusko and Mount Franklin Chalets.	recreational sites contributing to the heritage values of AANP will not be impacted by Snowy 2.0 Main Works. The nearest snow sport centre is Selwyn Snowfields, a small ski field on the Kings Cross Road, off Link Road. No direct impacts to the use of this area is expected, however there will be indirect impacts associated with an increase of construction vehicles utilising the Snowy Mountains Highway and Link Road. Recreational uses potentially impacted by the project are limited to sites at Lobs Hole (remote camping, 4WD) and Tantangara (remote camping, fishing, 4WD, horse riding). At the end of construction, public access will be reinstated except where there is a risk to public safety (eg within reservoirs near operational intake structures). Snowy 2.0 Main Works will not impact the National Heritage values of recreation in the AANP.
Criterion B Rarity		
	Landscape and Topography The high altitudes of the plateaus and peaks in the AANP are prominent in a continent with an average elevation of only 330 metres above sea level. The AANP includes most of continental Australia's peaks over 1,700 metres and all of those over 1,900 metres. These high peaks and plateaus contain the vast majority of alpine and sub-alpine environments in Australia. The AANP experiences extensive snow coverage on a seasonal basis, and its glacial lakes are the only wetlands on the Australian mainland covered by ice sheets in winter. The high-altitude landscape of the AANP has outstanding heritage value to the nation for its topographic heights, uncommon alpine and sub-alpine ecosystems and glacial lakes. (AALC 2005; DEC 2006; Geoscience Australia 2007).	The landscape values of KNP have been assessed in Spackman Mossop Michaels (Appendix S) as relevant to Snowy 2.0 Main Works. The sensitivity of the existing landscape character to change is recognised as high due to its scenic quality, landforms and topography, alpine vegetation, and many other unique characteristics. While the assessment concludes that landscape character impacts are higher during construction, rehabilitation of disturbed areas is expected reduce these impacts during operation. Permanent structures to remain within KNP will be new elements in the landscape. However, these are largely within previously disturbed areas or are consistent with the presence of other infrastructure established during the existing Snowy Mountains Scheme and familiar to visitors of KNP (such as the existing reservoirs and buildings). A number of design

Item	Official values	Impact assessment and proposed management and mitigation
		measures have been recommended to minimise the visual and landscape impacts of Snowy 2.0 Main Works on KNP.
	<p>Glacial and Periglacial Features Continental Australia and its southern territorial islands have experienced periods of historic glaciation, with current snow and ice coverage limited to the highest peaks and altitudes. On mainland Australia, the AANP preserves a concentration of glacial and periglacial features without comparison from the ice ages of the late Quaternary Period. The Kosciuszko Plateau is unique in mainland Australia as the only place irrefutably exhibiting landforms shaped by Late Pleistocene glaciers during a series of glacier advances known as the Late Kosciuszko Glaciation. The active and fossil periglacial landforms of the AANP include blockstreams and solifluction features (solifluction is the gradual movement of waterlogged soil down a slope, especially where percolation is prevented by a frozen substrate). They are the most striking and extensive in mainland Australia and demonstrate the widespread effects of cold climate in the Quaternary, mild climate in the Holocene and the absence of intensive Pleistocene ice modification of the elevated landscape of the Victorian and ACT Alps. Therefore, the AANP has outstanding heritage value to the nation for containing uncommon glacial and periglacial features (Percival 1985; Yeates 2001; Barrows et al. 2001).</p>	<p>The potential impacts and management for glacial and periglacial features are addressed under Criterion A in this table. The project will have minimal effect on the rarity of these values because the Cenozoic Geodiversity Assessment identified that a significant extent of block streams would remain present in the Ravine area, despite there being impacts proposed to five periglacial block streams (Troedson 2019).</p> <p>The affected uncommon periglacial features will be showcased by providing a nearby stopping bay and educational signage at Lobs Hole Ravine Road. This has the potential to enhance the geotourism value of the periglacial features.</p>
	<p>Fossils The Mt Howitt fish fossil site is globally rare because it preserves a diverse array of fossil fish in uncommon detail at all stages of their lives. It is unique nationally in providing a snapshot of a complete freshwater vertebrate community from the past, and for yielding fossils from all stages of growth of a species, from tiny fish larvae to adult</p>	<p><i>Not applicable – relates Mt. Howitt fish fossil site which will not be affected by the project.</i></p>

Item	Official values	Impact assessment and proposed management and mitigation
	fish, and therefore has outstanding heritage value to the nation because of its preservation of an uncommon aspect of Australia's natural history (Long 2002; Cook ed. 2007).	
	<p>Alpine and Sub-alpine Ecosystems</p> <p>The AANP has outstanding heritage significance to the nation for possessing extremely uncommon aspects of Australia's natural history. Alpine and sub-alpine ecosystems are uncommon in the generally arid and warm climate of Australia. The distribution of cold-climate species on the mainland retreated to the higher altitudes of the Alps in the Late Pleistocene as conditions began to warm up. The AANP contains most of the alpine and sub-alpine ecosystems on mainland Australia, supporting flora and fauna species that have evolved to the harsh conditions of the high altitudes. Many of these species are endemic to the Alps and are found nowhere else in Australia. The bog and fen groundwater communities are supported by organic soils and contain exceptional water retention properties. These communities play an integral role in ecosystem function by regulating the slow release of water from saturated peatbeds to the surrounding alpine humus soils, streams and other alpine communities (Good 1995; AALC 2006b).</p>	<p>The BDAR completed for the project assessed the impacts to Alpine and sub-alpine peatlands, damp herbfields and fens which are referred to as 'Alpine Sphagnum Bogs and Associated Fens' (Appendix M.1). Direct impacts to these ecosystems have been largely avoided during the detailed design process by review and redesign of proposed infrastructure and comms line routes. Small areas where comms routes intersect with the ecosystems will be offset in accordance with the biodiversity offset framework outlined in Appendix M.1.</p> <p>As a result of the measures to avoid and minimise impacts, particularly removal of large sections of the project area across the plateau area, there has been a significant reduction in impacts to this community. Snowy 2.0 Main Works will result in a residual impact to 3.94 ha of the community, representing 0.04% of the national extent of the community. A further 17.51 ha is mapped within the groundwater drawdown area and may be subject to impacts arising from changes in hydrology. The scale and extent of these impacts are unknown and will be subject to ongoing monitoring.</p> <p>For further detailed assessment on threatened flora and fauna within the KNP, refer to the BDAR (Appendix M.1).</p>
	<p>Eucalypt Flora Community</p> <p>The AANP provides an outstanding example of the adaptability of a plant genus, the genus Eucalyptus, along a steep topographical transect. The eucalypts dominate the AANP vegetation from the lowlands to as high as the alpine region, where the snow gum (<i>E. pauciflora</i>) defines the treeline. Much of the highest land in Australia occurs within the AANP, which also demonstrates very large topographical variations, which in turn is reflected in the</p>	<p>A key focus of design for Snowy 2.0 Main Works has been to avoid and minimise impacts to biodiversity values, including Eucalypt flora communities. Eucalyptus species provided important habitat and food supply for a variety of threatened fauna species. Where viable, high condition vegetation has been avoided, utilising existing tracks and low condition vegetation where Eucalypts are not present. Areas where Eucalyptus communities were unable to be avoided will be offset in</p>

Item	Official values	Impact assessment and proposed management and mitigation
	high diversity of eucalypt species replacing each other along the altitudinal and climatic gradient (Costin 1988; Kirkpatrick 1994; ISC 2004; ANHAT 2007).	accordance with the biodiversity offset framework as discussed in the BDAR (Appendix M.1). For further detailed assessment on threatened flora and fauna within the KNP, please refer to the BDAR (Appendix M.1).
Criterion D Principal characteristics of a class of places		
	<p>North-East Kosciuszko Pastoral Landscape The landscape is outstanding for demonstrating the use of mountain resources, namely the summer grasses and herbfields. As a relict landscape of past grazing leases it conveys the principal characteristics of transhumance and permanent pastoralism in a remote environment, these being large areas of open grassy landscapes between timbered ridges and hills, stockman's huts, homestead complexes, stockyards and stock routes. The grasslands with swathes of pioneer shrubs include the Kiandra landscape, Boggy Plain, Nungar Plain, Gulf Plain, Wild Horse Plain, Tantangara Plain, Dairymans Plain, Currango Plain, Long Plain, Cooleman Plain, Kellys Plain, Blanket Plain, Peppercorn and Pockets Saddle (KHA 2008). Homestead buildings include Cooinbil and Old Currango and the modest homestead complexes of Currango and Coolamine with additional features including exotic plantings, sheds, barns, and workers' accommodation. Former stock routes, now fire trails, include the Port Philip Fire and Murrays Gap Fire Trails. Located in the former grazing leases are stockman's huts, Bill Jones Hut, Circuits Hut, Gavels Hut, Hains Hut, Hainsworth Hut, Millers Hut, Oldfields Hut, Pedens Hut, Pockets Hut, Townsends Lodge, Gavels Hut, Long Plain Hut, Gooandra Hut, Schofields Hut, and Witzes Hut (KHA 2008), which in their use and re-use of available materials</p>	<p>The areas in which impacts would occur in the Plateau and Tantangara areas are within the north-east Kosciuszko Pastoral Landscape. Specifically, minor impacts would occur within the Kiandra landscape, Boggy Plain, Nungar Plain, Tantangara Plain and Kellys Plain. The relic landscape is comprised of open grassy landscapes between the timbered ridges and hills and includes huts, homestead complexes stock yards and stock routes occur within the general area of the disturbance area, however, the primary evidence is old stock fences lines, many of which occur within the project footprint. No huts, homesteads or stock yards occur within the disturbance area. Furthermore, the impacts would occur as linear road access (existing roads/fire trails) or underground cabling within road corridors and can be considered to be minor in nature. The impact assessment as presented in Section 9 of this report has determined that impacts to stock fences range from negligible or little in most instances, to moderate in a few. In order to minimize impacts to the official value of the North-east Kosciuszko Pastoral Landscape, management and mitigation measures have been proposed as set out in Section 10. These include measures such minimizing impacts as much as possible, the establishment of no-go zones, archival research and archival recording.</p>

Item	Official values	Impact assessment and proposed management and mitigation
	typify a lifestyle and vernacular bush building technology using hand tools. The array of characteristics relate to over a century of alpine grazing.	The proposed action will not cause a significant impact to the National Heritage values of North-east Kosciuszko Pastoral Landscape in the AANP.
Criterion E Aesthetic characteristics		
	<p>Distinctive and valued landscapes</p> <p>The AANP is a powerful, spectacular and distinctive landscape highly valued by the Australian community. The mountain vistas, including distinctive range-upon-range panoramas, snow covered crests, slopes and valleys, alpine streams and rivers, natural and artificial lakes, the snow-clad eucalypts and the high plain grasslands, summer alpine wildflowers, forests and natural sounds evoke strong aesthetic responses. Much of the terrain of the AANP is highly valued for its remoteness, and naturalness, including views to and from the region that capture snow clad ranges and mountain silhouettes against clear skies as well as expansive views of natural landscapes from the high points of the Alps.</p> <p>The upper Snowy River and Snowy Gorge, Mount Buffalo, the Kosciuszko Main Range, Lake Tali Karng, Dandongdale Falls the peaks and ridges between and including Mt Cobbler, Mt Howitt and the Bluff, and other high peaks, ridgelines, granite outcrops and escarpments are examples of dramatic awe-inspiring landscapes.</p> <p>Recreational pursuits in these landscapes are enhanced by aesthetic appreciation of their wild and natural quality.</p> <p>Snow-covered eucalypts, huts in mountain settings and mountain landscapes are distinctive Australian images captured by numerous artists and photographers. The</p>	<p>The disturbance areas in which impacts would occur are not specifically recognized as a powerful, spectacular and distinctive landscapes. Many of the notable aesthetic values of the AANP such as mountain vistas, including distinctive range-upon-range panoramas would not be impacted by project.</p> <p>Minor, insignificant or temporary impacts would otherwise occur to aspects of the landscape including snow covered crests, slopes and valleys, alpine streams and rivers, natural and artificial lakes, the snow-clad eucalypts and high plain grasslands and summer alpine wildflowers would. Most of the high plain grasslands and valleys across Plateau will only have minor visual impacts through linear infrastructure.</p> <p>Most of the proposed permanent structures are within previously disturbed areas or are consistent with the presence of other infrastructure established during the existing Snowy Mountains Scheme and familiar to visitors of KNP (such as the existing reservoirs and buildings). Accordingly, such landscapes are not necessarily distinctive as natural and remote landscapes because human modification through damming and infrastructure is clearly visible in key project areas such as Talbingo and Tantangara reservoirs.</p> <p>Lobs Hole represents a cleared and remnant indicator of the previous Ravine Village and Lobs Hole Mining Complex. These</p>

Item	Official values	Impact assessment and proposed management and mitigation
	mountain landscapes have inspired poets, painters, writers, musicians and film makers.	historical land uses have resulted in a landscape that is not prized for its natural or remote landscape values.
Criterion G Social value		
	The Australian Alps have a special association with the Australian community because of their unique landscapes, the possibility of experiencing remoteness and as the only opportunity for broad-scale snow recreation in Australia. The AANP is widely recognised by Australians as the 'high country' and many community groups have a special association with the AANP for social and cultural reasons.	The social values of KNP have been assessed by TRC Tourism (Appendix Y) through a recreational user assessment, which has included responses to a survey of park users within the areas potentially impacted by Snowy 2.0 Main Works. Lobs Hole and Tantangara are recognised as camping destinations for those that want to experience the remoteness of the area, undertake water-based activities, or have a family connection to the area. While there will be impacts to recreational uses at Lobs Hole and Tantangara, it is proposed to rehabilitate these impacted areas to provide improved recreational facilities. There is opportunity to improve the social values of AANP by providing improved access and facilities at these locations. The rehabilitation and master planning of potential recreational facilities will be determined in consultation with NPWS, to ensure relevant KNP values are maintained.
Criterion H Significant people		
	Baron Ferdinand von Mueller is recognised for his contribution of Australian botany particularly his extensive and thorough botanical collections of the Australian Alps. Eugen von Guerard was a significant nineteenth century artist producing a prolific record of Australian landscapes. His 1863 painting the <i>North-east view from the northern top of Mount Kosciusko</i> is regarded as one of his finest artistically and is in Australia's national collection. Through his ballad <i>The Man from Snowy River</i> , Andrew Barton 'Banjo' Paterson captured the imagination of the	No areas in the disturbance are specifically associated with significant people. The proposed action will not cause a significant impact to the National Heritage values relating to significant people in the AANP.

Item	Official values	Impact assessment and proposed management and mitigation
	Australian people, stimulating a passion for the High Country and the way of life associated with the mountains. His iconic ballad has had a lasting influence on Australians. The writer Elyne Mitchell and poet David Campbell lived near the mountains and their strong association with the place is expressed in much of their nationally important literary works.	

11.3.4 Impact Assessment - Snowy Mountains Scheme

The table below presents the impact assessment for the project on the SMS. The impact assessment has been guided by the criteria for significant impacts for National Heritage places set out in the MNES significant impact guidelines (Commonwealth of Australia 2013).

Table 128 Impact Assessment – Snowy Mountains Scheme.

Item	Official values	Impact assessment and proposed management and mitigation
Criterion A Events Processes		
	The Snowy Mountains Scheme is an unprecedented civil engineering project stimulated by the will of the post-World War II Commonwealth Government to build a strong Australian economy. The Snowy Mountains Scheme was a major impetus in the development of Australia's engineering expertise and industrial relations environment in the post-war period. The Snowy Mountains Scheme employed people from thirty different countries, including approximately 60,000 European Displaced Persons and migrants. The Scheme was hailed as a model of multicultural co-operation and integration and provided the opportunity for thousands of migrants to start a new life after the impacts of the war. The vast workforce that was required to build the Snowy Mountains Scheme required new management practices and the mechanisms implemented by Sir William Hudson permanently changed the nature of industrial relations and workplace conditions in Australia.	The project will not cause an impact to the National Heritage values associated with the engineering expertise and industrial relations environment of the Snowy Mountains Scheme in the post-war period. The proposed action would not diminish the significance of the Snowy Mountains Scheme relating to the multicultural co-operation and integration provided to the thousands of migrants to start a new life after the impacts of the war.
Criterion B Rarity		
	The Snowy Mountains Scheme is a rare example of an engineering program of enormous complexity and scale.	In the original Snowy Scheme design, a tunnel and associated power station between Tantangara and Talbingo was proposed. It was never built, and it is this link between the two existing reservoirs that Snowy Hydro Limited (Snowy Hydro) now plan to construct as Snowy 2.0. Accordingly, the proposal would serve to complete the scheme and hence amplify the significance of the Snowy Mountains Scheme. The proposed action will not cause an impact to the rarity of the engineering program of enormous complexity and scale which is embodied in the Snowy Mountains Scheme.

Item	Official values	Impact assessment and proposed management and mitigation
Criterion D Principal Characteristic of class of places		
	The Snowy Mountains Scheme is an exemplar as a currently operating, intact hydro-electric scheme that is the largest and most complex example of such schemes in Australia. The Snowy Mountains Scheme retains all the characteristics of a complex hydro-electric and irrigation scheme with a very high degree of integrity.	The project will not cause an impact to the example of the Snowy Mountains Scheme as a currently operating, intact hydro-electric scheme that is the largest and most complex example of such schemes in Australia. The proposed action will not cause an impact to any aspect of the nature of the complex hydro-electric and irrigation scheme. As a component of the original design, Snowy 2.0 would serve to further develop the scale and complexity of the existing electric and irrigation scheme.
Criterion F Creative or technical achievement		
	The Snowy Mountains Scheme is widely regarded as one of the engineering wonders of the world. The Scheme is a major engineering feat that is recognised for its technical excellence and innovation.	The project will not cause an impact to the status of the Snowy Mountains Scheme as being one of the engineering wonders of the world. The proposed action will not cause an impact to the technical excellence and innovation as embodied in the Snowy Mountains Scheme. As a component of the original design, Snowy 2.0 would serve to further develop the engineering significance and technical excellence and innovation that the scheme is recognised for its.
Criterion G Social value		
	The Snowy Mountains Scheme is strongly symbolic for large parts of the Australian community and is held in special regard, especially by the thousands of former Snowy workers and their families who lived and worked there.	The project will not cause an impact to the symbology embodied in the Snowy Mountains Scheme to large parts of the Australian community, especially the thousands of former Snowy workers and their families who lived and worked there.
Criterion H Significant people		

Item	Official values	Impact assessment and proposed management and mitigation
	The Scheme is significant for the association with Sir William Hudson and Olav Olsen. Hudson, the 'Father of the Snowy', was Commissioner of the Snowy Mountains Authority from 1949 to 1967. Olsen was originally on the Hydro-electric Sub-committee of the Commonwealth-States Technical Committee and was subsequently employed as the Chief Investigating Engineer for the Snowy Mountain Authority.	The project will not cause an impact to the significance of the work of Sir William Hudson and Olav Olsen in relation to the Snowy Mountains Scheme.

11.2.5 Impact Assessment – Kosciusko National Park

Overall Snowy 2.0 Main Works will have a minor impact on AANP values through ground disturbance activities within the project disturbance footprint and permanent and temporary changes to natural and heritage landscape characteristics through constructed project elements. Landscape character impacts are higher during construction, but suitable rehabilitation of disturbed areas will reduce these impacts during operation. Snowy 2.0 Main Works will impact values of the AANP relating to geodiversity, ecology, cultural heritage, landscape character and recreation. However, proposed impacts are within a manageable framework that will be minimised and result in only limited loss of official values, which will be confined to the areas within the project disturbance footprint and vantage points overlooking the affected landscapes.

Positive impacts to the values of the ANNP includes the additional scientific research that has been completed for Snowy 2.0 Main Works and will be built upon subsequent to project approval. This includes significant ecological findings (eg critically endangered Smoky Mouse) and increased evidence of Aboriginal and historical occupation of the KNP. Furthermore, there will be enhanced recreational values through improved recreational access and facilities within the KNP, subject to ongoing consultation with NPWS.

The project is assessed to have a direct positive on the National Heritage values of the Snowy Scheme through further developing the civil engineering project stated in 1949 and is likely to reignite an interest in the scheme and its symbolism relating to a multicultural, independent and resourceful Australian identity. Overall the project represents an expansion of a major engineering achievement which is a key value of the Snowy Scheme.

12. CONCLUSIONS AND RECOMMENDATIONS

The recommendations are made on the basis of:

- A consideration of the relevant legislation (see Section 8 Statutory Information).
- The results of the investigation as documented in this report.
- Consideration of the type and need of the development proposed, and the nature of proposed impacts.

The following recommendations are made:

1. Specific management and mitigation measures are listed for each individual heritage item in Section 10. A series of management recommendations are presented. In some instances, no impact mitigation is required. For others a range of measures are recommended ranging from salvage of movable heritage to salvage excavation.
2. The location of the Ravine Cemetery and Washington Hotel at Lobs Hole Ravine should be clearly identified on any plans associated with the project. The boundaries of the Cemetery should be identified on the ground and the area should be marked as a no go zone so as to ensure that no inadvertent impacts occur in that area.
3. A Cultural Heritage Management Plan (CHMP) is required to be prepared to manage impacts, avoidance of impacts and impact mitigation to the historic heritage in the project area.
4. An unexpected finds protocol would need to be developed.
5. The CHMP would need to set out guidelines for the management of movable heritage located anywhere in or near the project areas, to ensure that it is not inadvertently impacted or removed.

A summary of the heritage management and mitigation measures for the Main Project is provided in the table below.

Table 129 Summary of impacts and mitigation measures.

Impacts/risks	Reference #	Measures
Loss of historic heritage	HER03	Salvage and/or archival recording of potential and known heritage items to be conducted in respect of certain items that warrant that level of impact mitigation.

Impacts/risks	Reference #	Measures
	HER04	<p>Specific management and mitigation measures are listed for each individual heritage item in this report and will be included in a cultural heritage management plan (CHMP). A series of management recommendations will be presented. In some instances, no impact mitigation is required. For others a range of measures are recommended ranging the establishment of no-zones to ensure the protection of items, salvage of movable heritage to salvage excavation and archival recording.</p> <p>Appropriate avoidance measures will be taken for Washington Hotel (site R20) and Ravine Cemetery (R118).</p> <p>A minimum 20 m project construction avoidance buffer will be applied to the Washington Hotel (site R20) structure.</p> <p>No ground disturbance will occur within the cadastral boundary of Ravine Cemetery. Some non-ground invasive vegetation clearance will be required at the western and northern boundaries of the cadastral boundary of Ravine Cemetery (refer to bush fire risk and hazard assessment, Appendix T).</p>

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