

**PEMBROKE**

**Olive Downs Coking Coal Project**  
Draft Environmental Impact Statement

**Appendix N**  
**Non-Indigenous**  
**Cultural Heritage**  
**Assessment**

# Olive Downs Coking Coal Project

Non-Indigenous Cultural Heritage

Technical Report

Pembroke Olive Downs Pty Ltd

May 2018



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## Glossary of Terms

Term	Abbreviation	Definition
Australian Heritage Council	AHC	Council established under the AHC Act.
<i>Australian Heritage Council Act 2003</i>	AHC Act	Provides for the establishment of the Australian Heritage Council.
Commonwealth Heritage List	CHL	Register of places significant to the Commonwealth, under the EPBC Act.
Converge Heritage + Community	Converge	Cultural heritage consultants engaged for the heritage assessment – authors of this technical report.
Department of Environment and Heritage Protection	DEHP	State department for the management of environment and heritage.
Department of the Environment and Energy	DEE	Federal department for the management of environment and heritage.
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	EPBC Act	Federal legislation of the management of environment and heritage.
Ground Integrity	GI	Criteria used in archaeological assessments to indicate level of ground disturbance.
Global Positioning System	GPS	Electronic device using satellites to determine location.
Ground Surface Visibility	GSV	Scale used in archaeological assessments to measure visibility of ground surface.
Integrated Development Assessment System	IDAS	State development assessment for applications lodged under SPA.
Local Heritage Register	LHR	Register of local heritage places, managed under QHA, SPA and local planning schemes.
Non-Indigenous Cultural Heritage	NICH	Historic heritage or post contact elements.
<i>Queensland Heritage Act 1992</i>	QHA	State Act for the protection of cultural heritage.
Queensland Heritage Council	QHC	Council established under the QHA.
Queensland Heritage Register	QHR	State register of heritage places, under the QHA.
Register of the National Estate	RNE	Former register of nationally significant heritage places. Now a non-statutory archive.
<i>Sustainable Planning Act 2009</i>	SPA	Legislation for planning/development in Queensland.
Terms of Reference	-	Terms used to guide the Project.
United Nations Educational, Scientific and Cultural Organization	UNESCO	Specialised agency of the UN.
World Heritage List	WHL	Register of places of outstanding universal value.

# 1 Introduction

Converge Heritage + Community (Converge) were engaged by Pembroke Olive Downs Pty Ltd (Pembroke), to undertake an assessment of Non-Indigenous Cultural Heritage (NICH) matters for the Olive Downs Project (the Project). This report presents the results of the NICH assessment relating to the Project. The Project area is located approximately 40 kilometres (km) south-east of Moranbah, Queensland. Refer to Figure 1 for the general location of the Project area. Refer to Section 5 for more plans and details about the Project development.

## 1.1 Purpose of the Study

This report presents the results of the NICH assessment and includes:

- A summary of the history and environment of the areas impacted by the proposed Project.
- The results of the NICH field assessment.
- The nature of the NICH significance of places and areas affected by the proposed Project and the potential impacts of the Project in relation to this significance.
- Specific recommendations for the management and protection of potential NICH sites and areas.

This assessment and its recommendations address the Project Terms of Reference and are intended to guide the management of NICH matters.

## 1.2 Nature of Project

The Project is an open cut coal mine within two mining domains, Olive Downs South and Willunga. In addition to the mine, the Project will include rail links, a water pipeline, Electricity Transmission Line (ETL) and access roads. Section 5 contains more information about the Project.

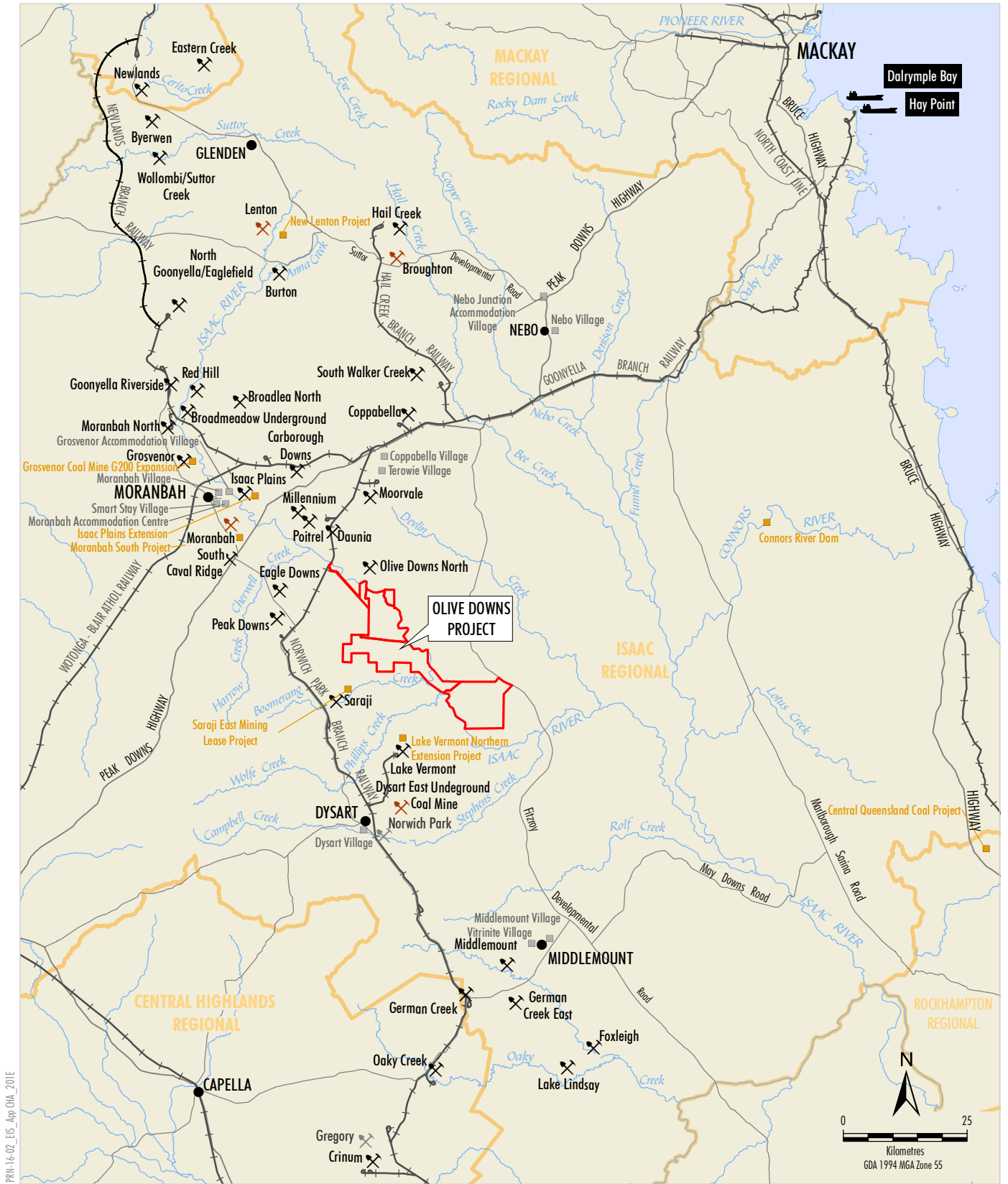
Pembroke proposes to develop the Olive Downs Project (the Project), a metallurgical coal mine and associated infrastructure within the Bowen Basin, located approximately 40 km south-east of Moranbah, Queensland (Figure 1). The Project provides an opportunity to develop an open cut metallurgical coal resource within the Bowen Basin mining precinct that can deliver up to 20 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal.

The Project comprises the Olive Downs South and Willunga domains and associated linear infrastructure corridors, including a rail spur connecting to the Norwich Park Branch Railway, a water pipeline connecting to the Eungella pipeline network, an electricity transmission line (ETL) and access roads (Figure 2). The coal resource would be mined by conventional open cut mining methods, with product coal to be transported by rail to the Dalrymple Bay Coal Terminal. Up to 20 Mtpa of run-of-mine coal would be extracted over the anticipated Project operational life of approximately 79 years.

## 1.3 Methodology

The following methodology was employed to meet the Project Terms of Reference for NICH (see Section 1.8), as well as following best practice and the legislative framework (see Section 1.7).





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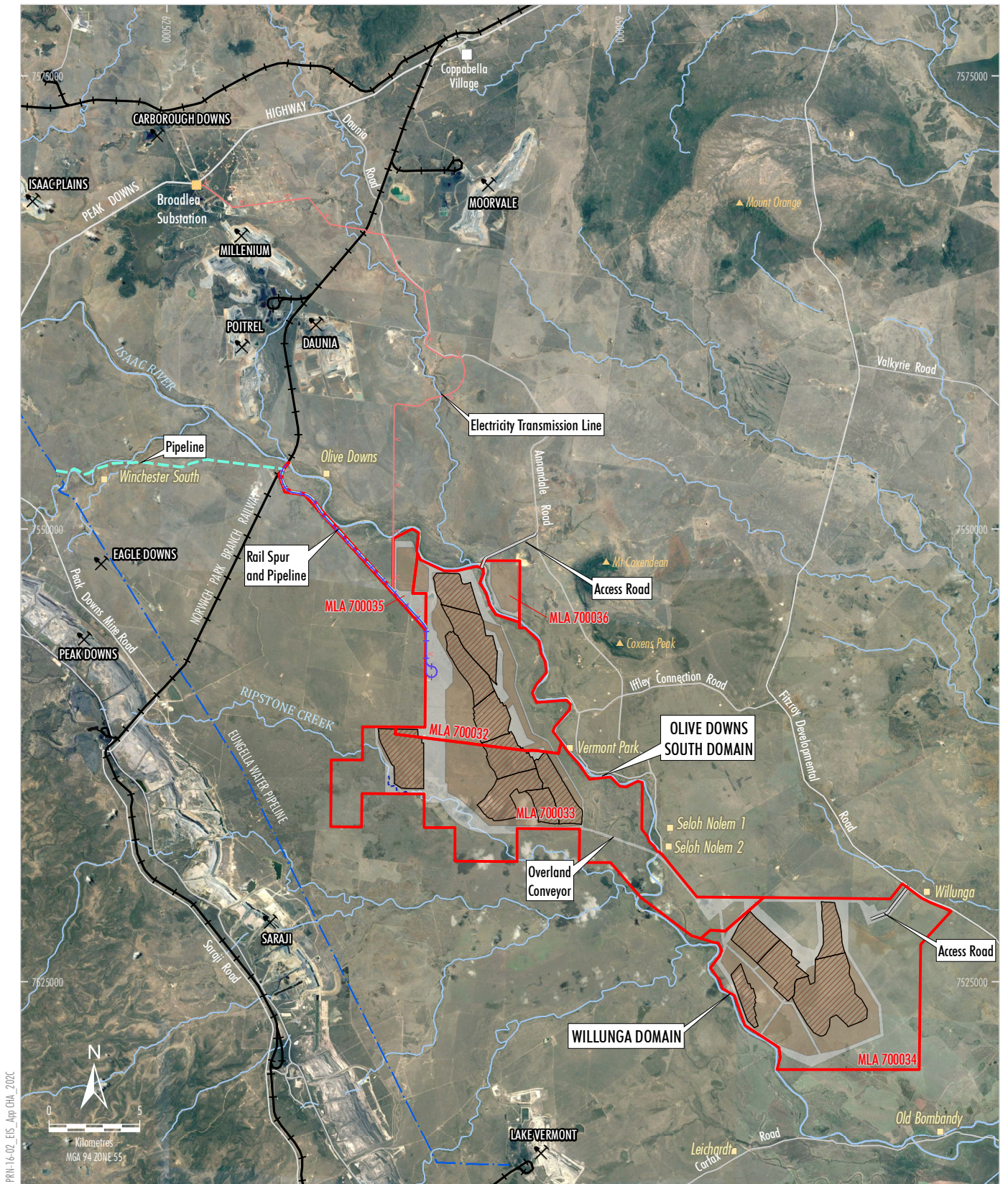
Source: Geoscience Australia - Topographical Data 250K (2006); Department of Natural Resources and Mines (2016)



- LEGEND**
- Mining Lease Application Boundary
  - Local Government Area
  - Major Road
  - ++ Railway
  - Port
  - Approved/Operating Coal Mine
  - Proposed Coal Mine
  - Under Care and Maintenance
  - Workforce Accommodation Facility
  - Coordinated, Major and Other Relevant Project

**PEMBROKE**  
OLIVE DOWNS COKING COAL PROJECT  
Regional Location

**Figure 1**



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- LEGEND**
- Mining Lease Application Boundary
  - Approved/Operating Coal Mine
  - Dwelling
  - Eungella Pipeline Network
  - Railway
  - Proposed Access Road
  - Proposed Electricity Transmission Line
  - Proposed Rail
  - Proposed Water Pipeline
  - Proposed Creek Diversion
  - Open Cut Pit Extent
  - Out-of-Pit and In-Pit Waste Rock Emplacement
  - Infrastructure Area

Source: Geoscience Australia - Topographical Data 250K (2006)  
 Department of Natural Resources and Mines (2016)  
 Orthophotography: Google Image (2016)



**OLIVE DOWNS COKING COAL PROJECT**  
 Project General Arrangement

**Figure 2**

### 1.3.1 Desktop Assessment

A desktop assessment was undertaken to determine the existence, extent and probable levels of significance of any places likely to be located within the Project area. This assessment comprised searches of statutory and non-statutory registers and databases, and a review of existing published and unpublished reports, surveys and assessments of the Project area and its immediate surroundings. The results of this desktop assessment were used to develop a targeted field survey of the Project area, and informed the assessment provided in this report. Refer to Section 3.

### 1.3.2 Field Surveys

The survey methodology adopted for the assessments incorporated a vehicle and pedestrian survey undertaken by Converge consultants across the Project area on 26<sup>th</sup> – 27<sup>th</sup> June 2017; and again, on 28<sup>th</sup> November 2017.

### 1.3.3 Field Sampling Strategy

Sampling strategies (where to look) can be 'purposive', where specific areas are targeted, or 'probabilistic', where decisions are made to survey without any prior knowledge or predictive model of what heritage resources might exist in the landscape to be surveyed. Cultural heritage survey strategies generally involve transects across the Project area chosen at random (probabilistic) to avoid possible bias in the results, or transects within areas (purposive) known to potentially contain places of historic significance, that are earmarked for development or that contain places identified in previous research or surveys.

The surveys for this report generally relied on a purposive sampling strategy. Historical and contextual research combined with the results of previous surveys enabled an initial assessment of those areas known to be of historical interest. Identified NICH sites and areas were recorded regarding site title, location, site integrity, ground surface visibility, condition and relevant comments including type of site and type of artefacts located at the site.

All assessment data was recorded in field notebooks and locations of any items or places of NICH significance were captured via a hand held global positioning system (GPS) receiver, accurate to ±5 metres using datum WGS 84/UTM 55 S. This information was then used to create maps identifying the location of sites and features noted during the assessment. Where access was not possible the general location of the site in relation to the nearest road access was identified by GPS. Areas of interest were photographed using a digital camera.

### 1.3.4 Site Integrity Criteria

An assessment of site integrity provides an indicator of the intactness and integrity of the site. Levels of site integrity were determined using a percentage range between 0-100% where 0% indicates all site integrity is gone, and 100% represents excellent preservation of the original context. Therefore: **Zero - 0%; Poor - 1-25%; Moderate - 26-50 %; Fair - 51-75 %; Good - 76-85%; Excellent - 86-100%.**

### 1.3.5 Ground Surface Visibility Criteria

Assessments of ground surface visibility (GSV) provide an indication of how much of the ground surface can be seen. GSV is most commonly inhibited by vegetation but other inhibitors may include concrete, gravel and bitumen. Levels of GSV were determined using a percentage scale in that 0% represents zero visibility and 100% represents maximum visibility (bare ground). Therefore: **Zero - 0%; Poor - 1-25%; Moderate - 26-50 %; Fair - 51-75 %; Good - 76-85%; Excellent - 86-100%**. The better the visibility, the more potential there is for locating historical/archaeological material.

### 1.3.6 Heritage Significance Criteria

Determining the significance of a heritage place, item or site requires research to enable an understanding of its value or level of importance. Assessments of heritage significance for this assessment were based on an understanding of the Project area's history, together with the physical analysis (field survey) and an appreciation of the comparative level of rarity or representativeness that the site possesses. In Queensland, heritage practitioners rely on two key documents to undertake significance assessments: *The Burra Charter of Australia International Council on Monuments and Sites (The Burra Charter)* (Australia ICOMOS 2013) and the *Queensland Heritage Act 1992* (QHA).

The QHA outlines the following criteria for assessing cultural significance of heritage places. Under Section 35 (1) of the QHA, a place may be entered in the register if it satisfies one or more of the following criteria:

- A. If the place is important in demonstrating the evolution or pattern of Queensland's history.
- B. If the place demonstrates rare, uncommon or endangered aspects of Queensland's cultural heritage.
- C. If the place has potential to yield information that will contribute to an understanding of Queensland's history.
- D. If the place is important in demonstrating the principal characteristics of a particular class of cultural places.
- E. If the place is important because of its aesthetic significance.
- F. If the place is important in demonstrating a high degree of creative or technical achievement at a particular period.
- G. If the place has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
- H. If the place has a special association with the life or work of a particular person, group or organisation of importance in Queensland's history.

The criteria used for assessing places of local heritage significance under the *Belyando Shire Council Plan 2006* mirrors the criteria developed under the QHA, except that a site's significance relates to the shire or locality rather than the state (Section 1.7.4 provides details). Once a site has been assessed using the above-listed QHA criteria, the following thresholds (Table 1) of relative significance are applied to determine the level (i.e. local, state or national) at which the site or element is considered significant.

Table 1: Relative Significance Criteria (Converge 2017)

Definition	Threshold
Element of outstanding/ exceptional significance or heritage value - embodies national or state heritage significance in its own right and makes an irreplaceable contribution to the significance/heritage value of the place as a whole.	Likely to fulfil national heritage entry criteria.
Element of high significance or heritage value - embodies state heritage significance in its own right and makes an irreplaceable contribution to the significance/heritage value of the place as a whole.	Likely to fulfil state heritage entry criteria.
Element of moderate significance or heritage value - embodies state or local heritage values in its own right and makes an irreplaceable contribution to values of the place as a whole.	Likely to fulfil state and/or local heritage entry criteria
Element of some significance or heritage value - embodies local heritage values in its own right and makes a significant contribution to the significance/heritage value of the place as a whole.	Likely to fulfil local heritage entry criteria
Element is neutral, with little or no heritage value.	Unlikely to fulfil local heritage entry criteria. May contribute to other elements of heritage value.
Intrusive element which detracts, or has the potential to detract, from the significance of the place.	Does not have heritage value. Does not contribute to other elements of heritage value.

Section 4 presents the results of the significance assessment of the Project area. The results from the significance assessment informed the impact assessment (Section 5), recommendations and management strategies for management of identified and potential NICH in the Project area (refer to Section 6).

#### 1.4 Constraints to the Survey

Constraints to the survey are as follows:

- This was not a systematic survey of the entire Project area, but rather two targeted surveys based on historical and contextual research and the results of previous surveys to broadly locate areas of historical interest.
- Only existing tracks were used to traverse the Project area.
- Within the Olive Downs South Domain a small section in the north-west of the Project area was not accessed (on the Wynette property). No sites identified during the desktop assessment were located in this area.
- GSV was poor across the Project area.

Notwithstanding, the survey effort is considered to be sufficient for the purposes of this assessment.

#### 1.5 Dates and Duration of the Work

Converge was engaged to undertake the assessment in May 2017. Field work was undertaken on the 26<sup>th</sup> and 27<sup>th</sup> June 2017 and again on 28<sup>th</sup> November 2017.

## 1.6 Personnel

Simon Gall (Director, Senior Archaeologist) Project managed the NICH assessment and provided strategic advice. Samantha Winnubst (Cultural Heritage Consultant) prepared the contextual background of the Project area. Dr Phillip Habgood (Senior Archaeologist) and Simon Gall undertook the field assessment. The report was prepared by Samantha Winnubst and Dr Natalie Franklin (Senior Archaeologist).

## 1.7 Heritage Framework

Several national, state and local Acts and regulations are relevant to this NICH assessment. Knowledge of the heritage framework is essential when assessing sites, places or items of NICH significance. Searches of relevant statutory heritage registers associated with national, state and local legislation were undertaken for this study (refer to Section 2.1 for the results). Places included on these registers possess an established level of significance. However, the absence of a place on these registers does not demonstrate that it is not significant, as the registers are not comprehensive. Values can also change and evolve and places may become significant as a result.

### 1.7.1 World Heritage List

An on-line search of the World Heritage List (WHL) was conducted to identify places and sites of NICH significance located within the Project area. The WHL is compiled by United Nations Educational, Scientific and Cultural Organisation (UNESCO) and is an inventory of places considered to have outstanding universal value.

### 1.7.2 National Legislation

#### *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the key national heritage legislation and is administered by the Commonwealth Environment and Energy (DEE). This Act provides a number of statutory and legislative controls for heritage places. Places of national heritage value and those owned or managed by the Commonwealth are located on the National Heritage List (NHL) and Commonwealth Heritage List (CHL) respectively.

#### *Australian Heritage Council Act 2003*

The *Australian Heritage Council Act 2003* (AHC Act) provides for the establishment of the Australian Heritage Council (AHC), which is the principal advisory group to the Australian Government on heritage issues. The AHC Act is also responsible for the assessment and nomination of places to the NHL and CHL.

#### *Protection of Moveable Cultural Heritage Act 1986*

The *Protection of Moveable Cultural Heritage Act 1986* regulates the export of Australia's significant cultural heritage objects. The Act does not restrict normal and legitimate trade in cultural property and does not affect an individual's right to own or sell within Australia.

### 1.7.3 State Legislation

Places of State heritage significance in Queensland are managed under the QHA. The Act provides for the establishment of the Queensland Heritage Council (QHC) and the Queensland Heritage Register (QHR), which lists places of cultural heritage significance to Queensland and regulates development of registered places. Under the provisions of the Act, any development of a place listed on the QHR must be carried out in accordance with the Act. A place may be entered in the register if it satisfies one or more of the assessment criteria under Section 35 (1) of this Act.

The Act also applies to potential archaeological places:

- Under Part 9 'Discovery and protection of archaeological artefacts and underwater cultural heritage artefacts'; Section 88 – 90.
- Section 89 requires a person to advise the Chief Executive Officer of the Department of Environment and Heritage Protection (EHP) of an archaeological artefact that is an important source of information about an aspect of Queensland's history. This advice must be given as soon as practicable after the person discovers the item.
- Section 90 stipulates that it is an offence to interfere with an archaeological artefact once notice has been given of the artefact to the Chief Executive Officer.

### 1.7.4 Local Legislation

Local heritage places are managed under Part 11 of the QHA, local planning schemes and the *Sustainable Planning Act 2009* (SPA). It is mandatory for local government to have a Local Heritage Register (LHR). The QHA provides a process for establishing and nominating places to a LHR. Specific criteria must be met to nominate a place to the LHR and these include:

- Enough information to identify the location and boundaries of the place.
- A statement about the cultural heritage significance of the place.

Following nomination to the LHR the Integrated Development Assessment System (IDAS) Code (contained in the *Queensland Heritage Regulation 2003*) and any relevant planning scheme provisions apply. The Project area is located within the local government area of Isaac Regional Council (IRC). The relevant planning scheme for the Project area is the *Belyando Planning Scheme*. Places of local heritage significance are listed in Division 7: 'Places and Items of Cultural Heritage' of the planning scheme.

### 1.7.5 Non-Statutory Framework

There are other sources for heritage places or historic sites than statutory registers. Places included in these sources are not afforded legislative protection. Nonetheless, places identified during searches of these sources contribute to a better understanding of the Project area and often identify places that have been overlooked for entry on statutory heritage registers. This is particularly important when considering the provisions of the QHA with regard to archaeological places.

#### Register of the National Estate – Archive

The AHC manages the Register of the National Estate - Archive (RNE). The RNE was frozen in 2007 and from February 2012 ceased to exist as a statutory register. The RNE remains an archive of information for more than 13,000 places across Australia, many of which are of local and state significance, and is therefore considered in this report.

### Queensland National Trust

The register of the Queensland National Trust (QNT) was searched for the Project. The QNT is the Queensland branch of the National Trust of Australia, which is a community based, non-government organisation that maintains a non-statutory register of heritage places.

The listing of a place on the QNT register, known as ‘classification’, has no legal force; however, it is widely recognised as an authoritative statement of the cultural significance of a place.

#### 1.7.6 Guidelines and Charters

This section provides details of the relevant guidelines and charters that are applicable to heritage practice in Australia. These key documents include *The Burra Charter* (Australia ICOMOS 2013), the Australian Historic Themes Framework and the QHC *Using the criteria: a methodology guidelines*, and are often used to assist practitioners in determining the heritage value of a place.

#### The Burra Charter

The *Burra Charter* (Australia ICOMOS 2013) is the leading guideline for heritage practitioners and provides guidance for the conservation and management of significant places. It defines cultural significance as “aesthetic, historic, scientific or social value for past, present and future generations” and goes on to state “cultural significance is embodied in the *place* itself, its *fabric, setting, use, associations, meanings, records, related places* and *related objects*” (Australia ICOMOS 2013). It outlines a specific methodology/ process for assessing sites.

#### Queensland Heritage Council Using the criteria: a methodology guidelines

QHC Heritage Council provides guidelines to assist in assessing which level of cultural heritage significance is applicable to a site (QHC 2006). These guidelines provide the following definitions:

*A place is of local cultural heritage significance if its heritage values are of a purely localised nature and do not contribute significantly to our understanding of the wider pattern and evolution of Queensland’s history and heritage...*

*A place is of state cultural heritage significance if its heritage values contribute to our understanding of the wider pattern and evolution of Queensland’s history and heritage. This includes places that contribute significantly to our understanding of the regional pattern and development of Queensland.*



### Archaeological Research Potential

The heritage significance of archaeological relics within the Project area was considered according to their potential ability to contribute to our understanding of the culture and history of the nation, state and local area, and the site itself. On the whole, more intact deposits and archaeological resources that can be used to address important research questions, or which can reveal information about little known aspects of history, will have the highest heritage significance. This is a matter that has been considered in an influential paper by Bickford and Sullivan (1984). They note that archaeological significance has long been accepted elsewhere in the world as being linked directly to scientific research value:

*A site or resource is said to be scientifically significant when its further study may be expected to help answer questions. That is scientific significance is defined as research potential.*

This is a concept that has been extended by Bickford and Sullivan (1984) in the context of Australian archaeology and refined to the following three questions which can be used as a guide for assessing the significance of an archaeological site or resource within a relative framework:

- Can the site contribute knowledge which no other resource can?
- Can the site contribute knowledge which no other site can?
- Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

## **1.8 Terms of Reference**

The Terms of Reference with regard to NICH matters for the Project are provided below (from Section 11.124 of the Terms of Reference).

*For non-Indigenous historical heritage, undertake a study of, and describe, the known and potential historical cultural and landscape heritage values of the area potentially affected by the Project. Any such study should be conducted by an appropriately qualified cultural heritage practitioner. If Heritage Act requirements are triggered, provide strategies to mitigate and manage any negative impacts on non-Indigenous cultural heritage values and enhance any positive impacts.*

*The non-Indigenous historical heritage impact assessment should also separately confirm if any known family grave sites would be impacted by the Project works and provide strategies to mitigate and manage any negative impacts on the historical family grave sites and enhance any positive impacts. Any discoveries of important archaeological artefacts must be reported to the Department of Environment and Heritage Protection (EHP) in accordance with the requirements of the Queensland Heritage Act 1992.*

Aboriginal Cultural Heritage is outside the scope of this report.

## 2 History and Context

This section provides the NICH desktop search results and a brief history of the Project area in the context of the broader development of Moranbah and surrounds. This section is not intended to be a complete history of the Moranbah area. It is based on a review of available primary and secondary sources and is intended to provide context for the identification and assessment of NICH sites, places and features within or nearby the Project area, and to properly assess their significance and the impact of any works on them.

### 2.1 Results of Heritage Searches

Table 2 presents the results of the NICH searches undertaken for the Project.

Table 2: Results of Heritage Searches.

Heritage Register or Database	Search Results
World Heritage List	No NICH sites on the WHL were identified in the Project area.
National Heritage List	No NICH sites on the NHL were identified in the Project area.
Commonwealth Heritage List	No NICH sites on the CHL were identified in the Project area.
Register of the National Estate	No NICH sites on the (former) RNE were identified in the Project area.
Queensland Heritage Register	No NICH sites on the QHR were identified in the Project area.
Local Heritage Register	No NICH local heritage sites were identified in the Project area.
Queensland National Trust Register	No NICH sites on the QNT register were identified in the Project area.

This assessment considers that, regardless of there being no heritage sites listed within the Project area, there may be unidentified NICH sites. These sites may include places of historical heritage, landscape and/or archaeological potential, which if found, may require further assessment under the provisions of the QHA. Such places may include burials or other evidence of historic land use in the Project area.

### 2.2 Previous Studies

The following studies (Table 3) were undertaken near Moranbah, near the current Project area, and were reviewed for the current assessment.

Table 3: Previous studies around Moranbah.

Consultant	Year	Project Title
Alfredson, G.	1990	Report on an archaeological survey of the North Goonyella Mining Lease.
	1991	Report on an archaeological inspection of the Moranbah North Coal Project Area for AGC Woodward-Clyde.
	1992	Report on a preliminary archaeological survey of a proposed dam site and access road for the North Goonyella Mine.
	1994a	Moranbah North Coal Mine: A cultural heritage assessment.
	1994b	A cultural heritage assessment of the Burton Coal Project.
	1995	A cultural heritage assessment of the section of the mine path between Suttor Creek Development Road and the Isaac River, part of the Teviot Dam and sections of the proposed haul road for Burton Coal Project.
ARCHAEO Cultural Heritage Services/Converge Heritage + Community	2005	Preliminary Cultural Heritage Assessment Goonyella Riverside Coalmine Expansion Project.
	2006a	Cultural Heritage Surveys of the proposed Goonyella Riverside Expansion Project: Portions of EPC 928, MDLA 307 and MDLA 358
	2006b	A Cultural Heritage Assessment of the Moranbah Ammonium Nitrate Project, Central Queensland.

Consultant	Year	Project Title
	2007	Cultural Heritage Surveys of the proposed Goonyella Riverside Expansion Project: Portions of ML1763, ML1764, ML1900, EPC928, EPC953, EPC554, MDLA307 and MDLA358.
	2008	Cultural Heritage Survey of the Ellensfield Project, Moranbah, Central Queensland.
	2012	Historic Cultural Heritage Assessment, Red Hill Project, Moranbah.
Brayshaw, H.	1976	Archaeological investigation of underground mining leases at Goonyella, Peak Downs, Norwich Park and Blackwater and their environs.
Hatte, E.	1996	An archaeological assessment of the proposed route of a water pipeline, Eungella to Moranbah, Central Queensland.
	1997	A Cultural heritage assessment of the North Bowen Basin Rail Link.
Resource Strategies	2017	Pembroke Olive Downs Project, Initial Advice Statement.  <b>This report did not identify any NICH issues for the Project area.</b>
URS	2012	Arrow Energy Bowen Gas Project, Non-Indigenous Cultural Heritage Technical Report.  <b>Note: this report identified a potential grave site, and cattle yard and homestead ruins near the proposed Project area, particularly around the Isaac River in the north of the current Project area.</b>

### 2.3 Historical Themes Overview

An understanding of historical themes is central to understanding the heritage significance of both landscapes and the built environment. It is also critical to determining whether a place should be included in a heritage register (using the criteria identified in the QHA). Applying the thematic framework developed by Blake (2005) in conjunction with Queensland EHP heritage staff, which drew upon the Australian Historic Theme framework developed by the Australian Heritage Commission (2001), the following themes are identified as relevant to the Project area (Table 4).

Table 4: Historic themes identified for the Project area.

Theme	Sub-theme	Description
2	2.0	Exploiting, utilising and transforming the land
	2.2	Exploiting natural resources
	2.3	Pastoral activities
6	6.0	Building settlements, towns, cities and dwellings
	6.1	Establishing settlements

### 2.4 Historic Summary

#### 2.4.1 European Exploration and Early Settlement

German explorer Ludwig Leichhardt was the first European to enter the northern Bowen Basin (Killin 1984: 1). Leichhardt spent January and February 1845 camped in and exploring the region that he later named Peak Downs and noted that it contained a number of well grassed luxuriant plains and scrubby sandstone ridges (Leichhardt 1964: 134). Leichhardt also noted the presence of coal after his party attempted to sink a waterhole, however this was not of prime concern, as he sought areas for pastoral use (Murray 1996: 13).

While passing through the area of modern Moranbah in February 1845, Leichhardt encountered a river that he named 'Isaac' in honour of his friend and supporter F. Isaacs from the Darling Downs (Leichhardt 1964: 149).

Encouraged by the reports of Leichhardt and other explorers, various figures took up pastoral leases in the area in the decade that followed. In 1854 Leichhardt's friend Jeremiah Rolfe squatted on a run he called 'Belyando Waters' until it later became a part of a legal pastoral division (Killin 1984: 3). Rolfe's unauthorised squatting was by no means unique as 'during the 1850s land acquisitions in inland central Queensland had been a free-for-all' (Murray 1996: 15).

After the Leichhardt District was officially opened for pastoral settlement in 1856, a number of other runs were taken up. The Archer brothers, also acquaintances of Leichhardt, took up 'Capella', 'Boree', 'Upper Crinum', 'Lower Crinum', and 'Laguna' (O'Donnell c.1989: 9). Oscar de Satge gained 'Wolfgang' in 1861 and John Muirhead established a 'massive sheep run at "Banchory"' in May 1860 (O'Donnell c.1989: 10). These holdings established a pattern of private pastoral leases that typified the region for the first 100 years of its settlement.

Early development was tempered by a tendency of some settlers to claim land purely for speculation with no intention to improve or make productive use of the land (Murray 1996: 15). This practice was eventually prohibited by Queensland colonial government legislation forcing settlers to 'occupy and work their properties' (Murray 1996: 15).

The encroachment of these settlers caused significant disruption to the existing patterns of life among the Aboriginal inhabitants of the area, and significant 'racial disharmony' followed (Killin 1984: 14). Contemporary records noted many massacres of pastoralists by Aboriginal groups in the region (O'Donnell c.1989: 11). Reports of European brutality toward Aboriginal people included several incidents associated with the notorious Lieutenant Fredrick Wheeler of the Native Mounted Police in the mid-1870s (Lack and Stafford 1965: 132-136). The unease caused by this racial tension meant that as late as 1895 station managers were choosing to live in 'fort like dwellings ... with slits for fighting blacks' (O'Donnell c.1989: 11).

Much of the area around what became the town of Moranbah was dedicated to pastoral activity during the 1860s and 1870s. Most land was available in leases granted for one to two years, but unfortunately records of these early leases remain sparse. Mr Andrew Scott is credited with taking up 'Moranbah' as a pastoral lease prior to 1880 (Belyando Shire Council 2006). After the 1880s, Scott's Moranbah was combined with other local leases to form 'Grosvenor Downs' station (Murray 1996: 16). However, 'Moranbah Holding' appears in the official records again in 1920, as grazing homestead for Mr H.R. Hart, and again in 1929 when Mr C.H. Clements acquired the station and renamed it simply 'Moranbah' (Belyando Shire Council 2006).

Although there was some early optimism about farming in the Moranbah district, sustainable agriculture proved difficult to establish. The Queensland State Farm at Gindie that ran from 1897-1932 failed to encourage widespread agriculture in the district (Killin 1984).

#### 2.4.2 Early Mining

Gold and copper were the first minerals to be extracted from the Bowen Basin mineral field in large quantities. Although the existence of coal had been known since Leichhardt's first explorations, the absence of reliable transport infrastructure retarded development of this resource. Since the first discovery of gold in 1861 (Killin 1984: 11), mining has substantially dictated the fortunes of the region alongside the pastoral industry, and many small towns and settlements appeared to capitalise on the mineral deposits.

Following the discovery of gold, the area experienced its first gold rush centred on the town of Clermont in August 1863 (Killin 1984: 11). Commensurate with the perception of quickly earned fortunes the town became renowned as 'an enterprising little township' remarkable only for its 'debauchery and bad language' (Bolton 1963: 28). The gold deposits were soon exhausted and by 1887 Queensland Mining Warden Edmund Morey concluded that the area was no more than a 'poor man's field' where 'washing-up' and 'fossicking' were the only remaining activities (Morey 1888).

Copper soon replaced gold as the 'life-blood' of the Bowen Basin (O'Donnell c.1989: 24). The first discovery of copper was made by Jack Mollard in 1861 (O'Donnell c.1989: 55). Reflecting the future trend in mining operations in the region, Sydney entrepreneur John Manton formed the Peak Downs Copper Mining Company with £100,000 capital in 1862 (Killin 1984: 28). Although this was the largest copper mining concern in the area, copper was still largely mined by individuals.

In concert with the discovery of copper and gold there was a 'boom and bust' cycle in many of the Bowen Basin settlements. Small towns situated at or close to gold and copper fields relied heavily on minerals for their well-being. Often when the deposits were exhausted the town ended too. Copperfield, Birimgan, Blackridge, Douglas Creek, McDonald's Flat and Theresa Creek were all mining towns that once were large enough to have schools and other basic services, but which eventually were deserted (O'Donnell c.1989: 55, 61, 89-110).

#### 2.4.3 Coal Mining to 1968

From the time of Leichhardt's explorations there were 'tantalizing reports of coal' in the region (Whitmore 1991: 318). However, there was little incentive to extract these reserves as there was limited local demand and no reliable means of transporting coal to the coastal markets. With the extension of the railways into central Queensland before the end of the nineteenth century the 'impetus for extending coal mining' in the area grew (Whitmore 1985: 281).

Following the exhaustion of the gold fields, the town of Blair Athol began to produce coal in a limited capacity for the central railways (Killin 1984: 37). The lack of a local market and absence of a rail link made the mine uncompetitive (Whitmore 1985: 284-291). With the extension of the Northern (later Central) railway line to Clermont in 1884, a small market for local coal evolved. Although this development was not enough to generate large-scale production, the Chief Inspector of Mines, C.F.V. Jackson, estimated that there were 44,000,000 tonnes of coal in the Clermont coal fields (Jackson 1909: 46-49).

Up to this point, underground mining had been the dominant technique in the Bowen Basin, but this method proved dangerous, costly and inefficient. To competitively extract coal, John William Hetherington committed his Blair Athol Coal and Timber Company to experiment with open-cut mining methods in 1921 (Whitmore 1991: 381-384). Beset by a variety of technological, weather and transportation problems and coupled with a low world demand for coal this experiment in open-cut mining was ended suddenly in 1923 (Whitmore 1991: 384).

It was not until Blair Athol Opencut Collieries Limited that the open-cut method was successfully applied to the coal seams of the northern Bowen Basin. Assisted by technological developments Blair Athol Opencut Collieries began open-cut mining in 1937 (Killin 1984: 56). This decision was rewarded with increased demand caused by improved world markets and World War II. Following 1945 Blair Athol Coal and Timber also reverted to open-cut mining at their mines with some success (Killin 1984: 59).

However, the economic viability of coal from the region was beset by the same problems, distance from large markets and lack of reliable transportation. These traditional problems were exacerbated when Queensland Rail changed to diesel locomotives in 1952 (Killin 1984: 66). These developments forced Blair Athol Opencut Collieries and the Blair Athol Coal and Timber Company to merge and form Blair Athol Coal Pty. Ltd. in 1965 (Killin 1984: 67). Despite technological advances, coal from Blair Athol was not competitive on the international market, leading to large amounts of stockpiling (Martin & Hargraves 1993: 155).

#### 2.4.4 Developments from 1968 – 1990s

With the purchase of Blair Athol Coal by a joint venture of Conzinc Riotinto of Australia (CRA) and Clutha in 1968, the era of multi-national companies in the Bowen Basin began (Killin 1984: 67). In a move that was to have direct implications for the Belyando Shire the US multinational Utah Development Corporation (UDC) opened their first open-cut coal mine in Blackwater in 1968, 290 km south-east of current day Moranbah (Martin and Hargraves 1993: 158). These large multinationals brought the necessary capital to modernise mining, ready access to large domestic and international markets, and enough political influence to ensure the necessary infrastructure developments.

By 1990 Queensland had taken the mantle of Australia's largest coal producing state (Martin and Hargraves 1993: 163) and by 1997 two thirds of Queensland's \$10 billion production of coal came from the Bowen Basin (Anon 1997: 16).

#### 2.4.5 Development of Moranbah

Located 191 km west of Mackay, the township of Moranbah has developed as the main town near the Project area. The origin of the word Moranbah remains somewhat unclear. The earliest recorded use of the term was to describe Andrew Scott's run prior to the 1880s. By the 1920s the designation had changed to 'Morambah', but when the town name was gazetted in 1969 the original 'Moranbah' had returned (Murray 1996: 16).

Moranbah is built on part of the former pastoral run known as Grosvenor Downs. Grosvenor, Grosvenor North and Grosvenor East all appeared on the Queensland Surveyor's General Office Run Map for the Leichhardt District (Surveyor General's Office 1882). By 29 April 1885 the registered lessee of Grosvenor Downs was Alexander Boner McDonald (Grosvenor Downs Run File: Held by the Queensland State Archives service - File Number: LAN/AF 388). McDonald's holding began with the original Grosvenor runs, but he was able to consolidate a number of other runs into an enlarged Grosvenor Downs (Grosvenor Downs Run File: Held by the Queensland State Archives service - File Number: LAN/AF 388). By the time of McDonald's death in 1907, Grosvenor Downs included Winchester, Teviot Bank, Broadmeadow, Roseylie, Broadlee, Hermitage Forest and Harrow.

Records show that McDonald ran mainly cattle on his property. This was the preferred use for the property throughout the rest of the twentieth century even though it underwent several lessee changes. By 27 November 1953 Arthur David, Adrienne Kathleen, and John Mitchell Muirhead had taken up the pastoral lease on the property (Grosvenor Downs Run File: held by the Queensland State Archives service - File Number: LAN/AF 388).

Although there were reports of high grade coal in vast quantities in central Queensland (Chas. R. Hetherington and Co. Ltd. 1964), it was not until 1968, with the discovery of a large seam of coal at Goonyella near the Isaac River, that the town of Moranbah was built (Williams 1979: i). UDC took up the mining rights to the land with the forecast of approximately 400 employees. Subsequently, 1100 acres of the 'Moranbah' lease, were purchased and became crown land (Belyando Shire Council 2006). On 4<sup>th</sup> October 1969, the Queensland Government Gazette announced, 'notification of intention to assign a place name, Moranbah, in the Parish of Moranbah, County of Grosvenor, in the shire of Belyando' (Murray 1996: 16). This action was complete on 22 January 1970 when the land for both Moranbah and Goonyella was transferred from the Nebo Shire Council to the Belyando Shire Council (Nebo Shire Council 2005).

The town of Moranbah was purpose built as a support town for the Goonyella mine (Bertoldi 1978: 55). Ullman and Nolan Consulting Engineers of Mackay were contracted to design a town 30 km south of the proposed mine site (Kingston 1986: 1). The estimated cost of the town, between \$2,142,000 and \$2,242,000, was borne by UDC, with the Belyando Shire Council supplying some infrastructure (Kingston 1986: 1).

Although the town was planned with a 'community focus' (Bertoldi 1978: 57), Moranbah was beset by many early difficulties. For the early residents Moranbah was not a welcoming location to live. The town resembled a 'construction site' and many of the employees and their families had to live in one of the two short term caravan parks established as temporary housing (Murray 1996: 42). This housing shortage was a cause of some industrial disputes between UDC and the peak mining unions (Williams 1979: 114).

In addition to the lack of suitable accommodation the isolation of the town meant that most residents were transitory. Many public servants, police officers and teachers remained in Moranbah for the minimum required period and the Salvation Army reported that a number of miners' wives 'ran away' from their husbands due to the hardships of living in an isolated location (Murray 1996: 86).

The Belyando Shire Council and the UDC sought to reverse the trend that saw only 18% home ownership in Moranbah (Bertoldi 1978: 62). A 'home purchasing scheme' began in October 1977, allowing residents to buy their current rental home at a 20% discount off the market price (Bertoldi 1978: 67-68). This scheme was not an initial success, for as one local put it 'most people never really thought that mining would last' so there was no point in purchasing a house (Murray 1996: 88). Nonetheless, infrastructure and service improvements were made to the town and several essential and recreational services were added. By the mid-1970s the town boasted a shopping centre, a little athletics club, dentists, air charter service, Australian Rules football club, 14 bed Moranbah Hospital, race track and golf course (Murray 1996:82). With the growth in mining operations the town continued to develop and by the late 1990s Moranbah was 'a slow and easy-going place' with 'a shopping centre, hospital, library, banks, video rental stores, a travel agency, churches, and even a modest zoo' (Murray 1996: ix). By 1996 a small pensioner housing development, a high school and increased home ownership showed that some residents in the town had come to see Moranbah as home (Murray 1996).

## 2.4.6 Development of the Project Area

Searches of the Queensland State Archives (QSA) in relation to the Olive Downs Pastoral Run were undertaken to determine the potential for historical infrastructure within the current Project area. The results of the research are summarised below.

In the early 1900s, the Project area was part of the 'Islington Holding' and surrounding runs in the District of Leichardt (Figure 3). It was used for running cattle and was said to have had permanent water in the Isaac River. The character of the pastoral run was described as 'open downs, basalt formations, black and brown soil, first class pastoral country, with moderately timbered forest lands. The country is almost level throughout and carries a heavy body of herbage, vine and edible bush. The principal timber is Brigalow, Box, Bloodwood and Sandalwood' (QSA Item ID 437838).

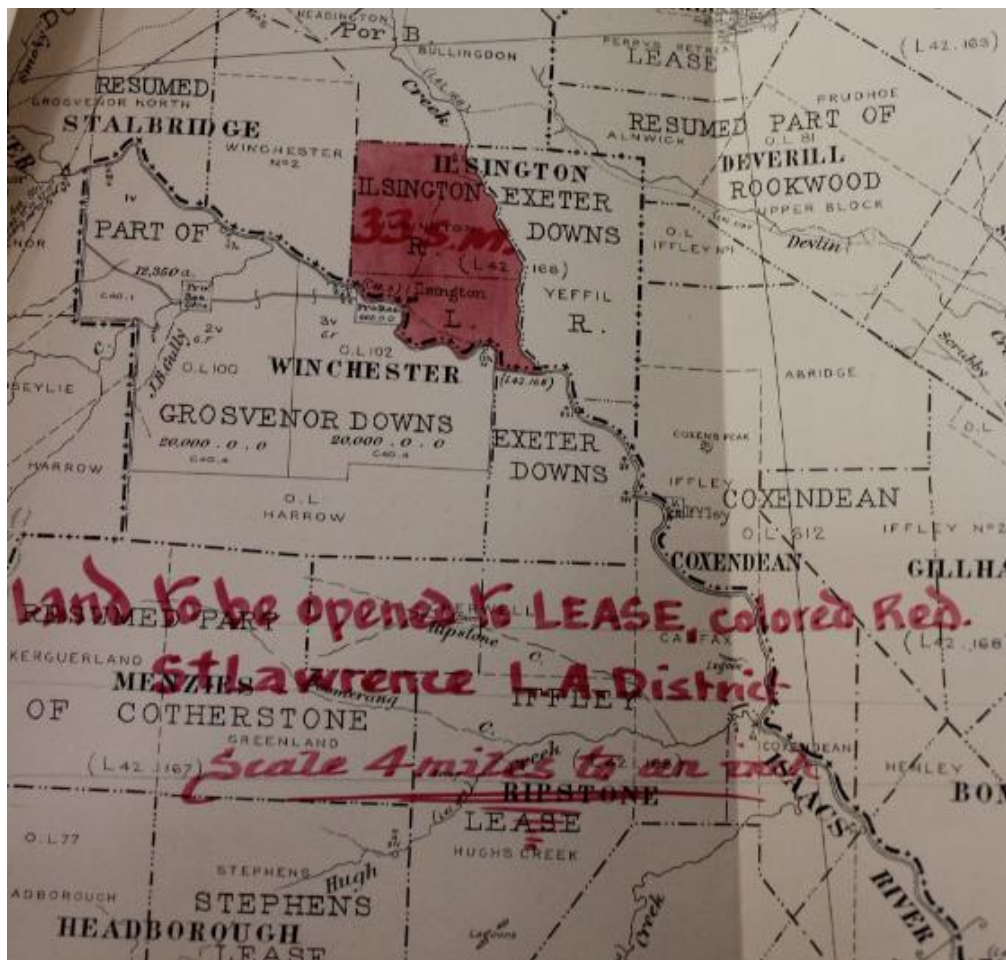


Figure 3: Islington Holding and surrounding runs in the Project area in 1907 (QSA Item ID 437838).





Figure 4: Olive Downs Holding and surrounding stations in the 1940s (QSA, Item ID 1110488).

The Islington run was later consolidated and became known as 'Olive Downs' by the 1940s (Figure 4). It was used for pastoral purposes until the early 1970s. Improvements on the property are described in the QSA run files as tanks, dams, a homestead and outbuilding (likely outside the Project area), access tracks, sand spears (bores), a mill, stockyards and a dip (Figure 5).

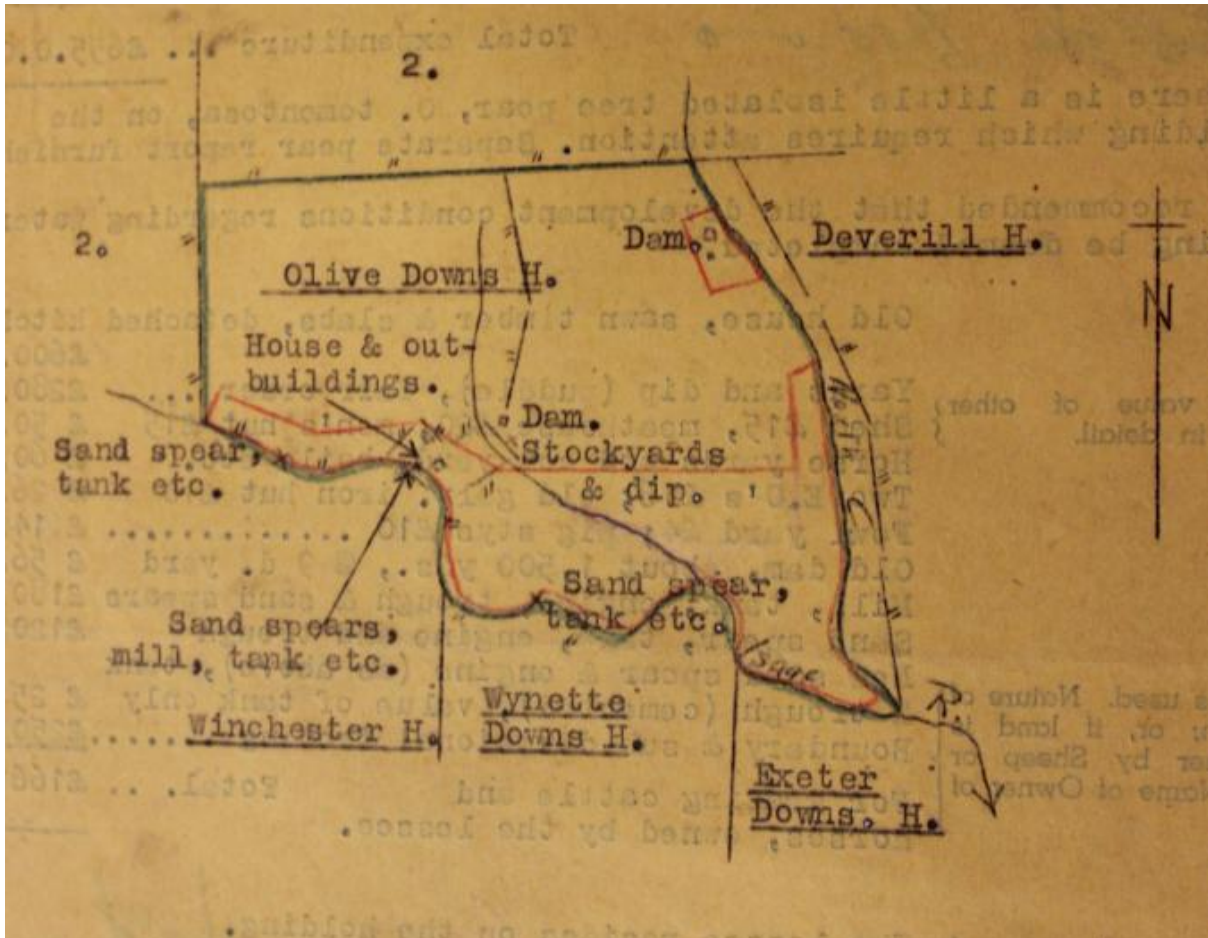


Figure 5: Improvements at Olive Downs in the 1940s (QSA Item ID 1110488).

### 3 Cultural Heritage Survey

This section provides an overview of the methodology, constraints and overall results of the field surveys. Fieldwork undertaken by Converge is based on widely understood and accepted forms of assessment that occur in a series of clearly defined steps including sampling, surveying, site evaluation, recording, impact assessment, and management recommendations.

Using the results of the historical research, heritage searches and from previous knowledge of the Project area, it was determined that a comprehensive field assessment was not required. A brief assessment was undertaken on 26<sup>th</sup> – 27<sup>th</sup> June 2017. A second assessment was undertaken on the 28<sup>th</sup> November 2017.

Archaeologically, the potential for significant finds to exist depends on the likelihood for significant material to be present, combined with an assessment of the GI and GSV (refer to Section 1.3, Methodology for the criteria relating to GI and GSV).

#### 3.1 Main Types of Land Zones in Project Area

The Project area predominantly comprised cleared grazing land (Figures 6 - 7) with patches of regrowth (Figures 10 - 11) and some remnant vegetation. Woodland areas are dominated by Eucalypt dry woodlands and Eucalypt open forests.

The Isaac River runs along the western boundary of Willunga Domain (Willunga) and along the eastern boundary of Olive Downs South Domain (Figures 8 - 9) with Ripstone Creek crossing its southwest corner. These waterways retain narrow riparian corridors.

There were sections of Gilgai within both Domains (Figures 13 - 14) and significant freshwater wetlands within the Willunga Domain (Figures 12). Table 5 outlines the major landforms and vegetation across the Project area (see also Pembroke Olive Downs Project Initial Advice Statement).

Table 5: Main type of landform across the Project area.


Land Zone	Indicative Images
Cleared grazing land - pasture	

Figure 6: Cleared grazing land, pasture.

Land Zone	Indicative Images
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Figure 7: Cleared grazing land.

Riparian corridor along the Isaac River



Figure 8: Riparian corridor along Isaac River.



Figure 9: Isaac River.

Land Zone

Indicative Images

Regrowth woodland



Figure 10: Regrowth woodland.



Figure 11: Regrowth woodland.

Freshwater Wetland



Figure 12: Freshwater wetland.

Land Zone

Indicative Images

Gilgai country



Figure 13: Gilgai country.



Figure 14: Gilgai country.

### 3.2 Identified NICH in the Project Area

Fifteen potential NICH sites were identified during the cultural heritage surveys in the vicinity of the Project. The locations of these sites are itemised in Table 6 and identified in Figures 15 and 16. See site cards in Section 3.3.

Table 6: NICH sites identified in stage 1 Project area (WGS84/UTM Zone 55 K)

Site #	Site Name	Coordinates	Brief Description
1	Cattle Ramp	55 K 645520 7535225	Remains of an earthen cattle ramp measuring c. 5m across, 8m long and 1m high. Located in a flat area with box trees. Possibly originally dates to the 1940s, but given that it is a timber and earthen ramp, it may be earlier.
2	Cattle Yards	55 K 646201 7540316	Extensive cattle yards with different fencing types, "Black River Cattle Equipment Co." and "Breckon Clermont" branded metal plates. Probably used over a long period of time, most recently in the 1960s and later.
3	Graves	55 K 644130 7534850	Grave of Audrey Frances Banks (1925-2001) and Mary Frances Hile (1908-1998) in an enclosure measuring c. 5m x 5m and 1m in height. Plaque on a slab of igneous rock.
4	Water Infrastructure 1	55 K 646352 7538813	Water infrastructure: Concrete-lined corrugated iron water trough system; corrugated iron and PVC water tanks; pump shed adjacent to the Isaac River. Probably dates to the 1940s and later.
5	Water Infrastructure 2	55 K 643279 7545302	Water infrastructure: Concrete-lined metal water trough (not corrugated) embossed with "SOUTHERN CROSS"; corrugated iron water tank nearby, not concrete lined. Probably dates to the 1950s and later.
6	Steam Boilers	55 K 659780 7524719	2 large steel riveted steam boilers in a field. Probably date to the early 1900s.
7	Water Infrastructure - Pump 1	55 K 657949 7521841	Water pumps with a series of concrete bases, one piece embossed with "SOUTHERN CROSS". Probably date to the 1950s and later, but potentially used over a long period of time.
8	Water Infrastructure - Pump 2	55 K 659238 7519216	Metal windmill style water pump on a concrete base. Probably dates to the 1960s and later, but was potentially used over a long period of time.
9	Cattle Loading Ramp 2	55 K 642404 7548282	Outside area (north) Earthen cattle loading ramp measuring 25m long and 2m high. Comprises massive horizontal wooden logs, some 1m in diameter, and wooden uprights. Also has metal stairs in one corner. Located in a flat grassed area. Possibly originally dates to the 1940s, but given that it is a timber and earthen ramp and the size of the logs used, it may be earlier.
10	Fence Post 1	55 K 642884 7546476	Potentially outside area 3 square metal railway sleeper spikes on the scar of a tree, with wire lashed to the spikes. This fence post possibly dates to the late 19 <sup>th</sup> /early 20 <sup>th</sup> century.
11	Fence Post 2	55 K 643524 7545382	Burnt out tree stump with 3 metal railway sleeper spikes for attaching fencing wire. This fence post possibly dates to the late 19 <sup>th</sup> /early 20 <sup>th</sup> century.
12	Fence Post 3	55 K 644027 7545211	Box tree with elongated scar and 4 railway sleeper spikes within it. Incorporated into a "cockys gate". This fence post possibly dates to the late 19 <sup>th</sup> /early 20 <sup>th</sup> century.
13	Fence Post 4	55 K 644964 7544611	Outside Area (south)

Site #	Site Name	Coordinates	Brief Description
			Box tree with natural scar bearing 3 railway sleeper spikes. This fence post possibly dates to the late 19 <sup>th</sup> /early 20 <sup>th</sup> century.
14	Water Infrastructure 3	55 K 642954 7546275	Water infrastructure: a round galvanised iron tank, inflow pipes and a water trough. Inflow pipe of the water trough is embossed with "COMET" and "2 ½ H". Probably dates to the same time as the improvements that were made to Olive Downs in the 1940s.
15	Wire Tree	55 K 644768 7544762	Outside Area (south) Old tree with 3 strands of wire within its burls from an old fence, where the tree has grown around the wire of the fence line. This fence probably dates to the late 19 <sup>th</sup> /early 20 <sup>th</sup> century.

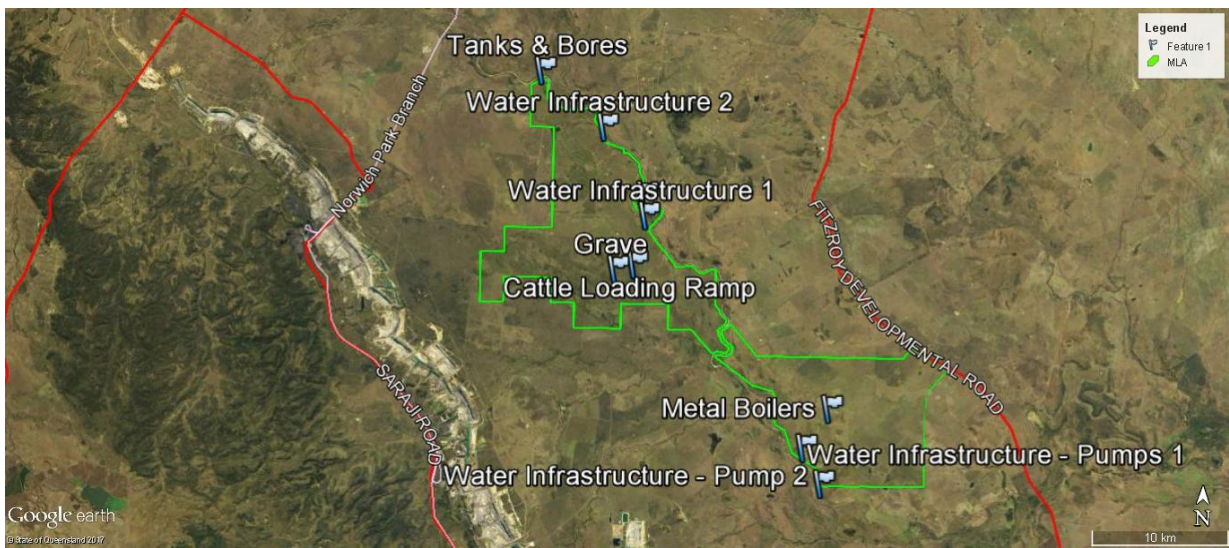


Figure 15: Location of sites in the Project area for initial survey (Base image Google Earth Pro 2017).

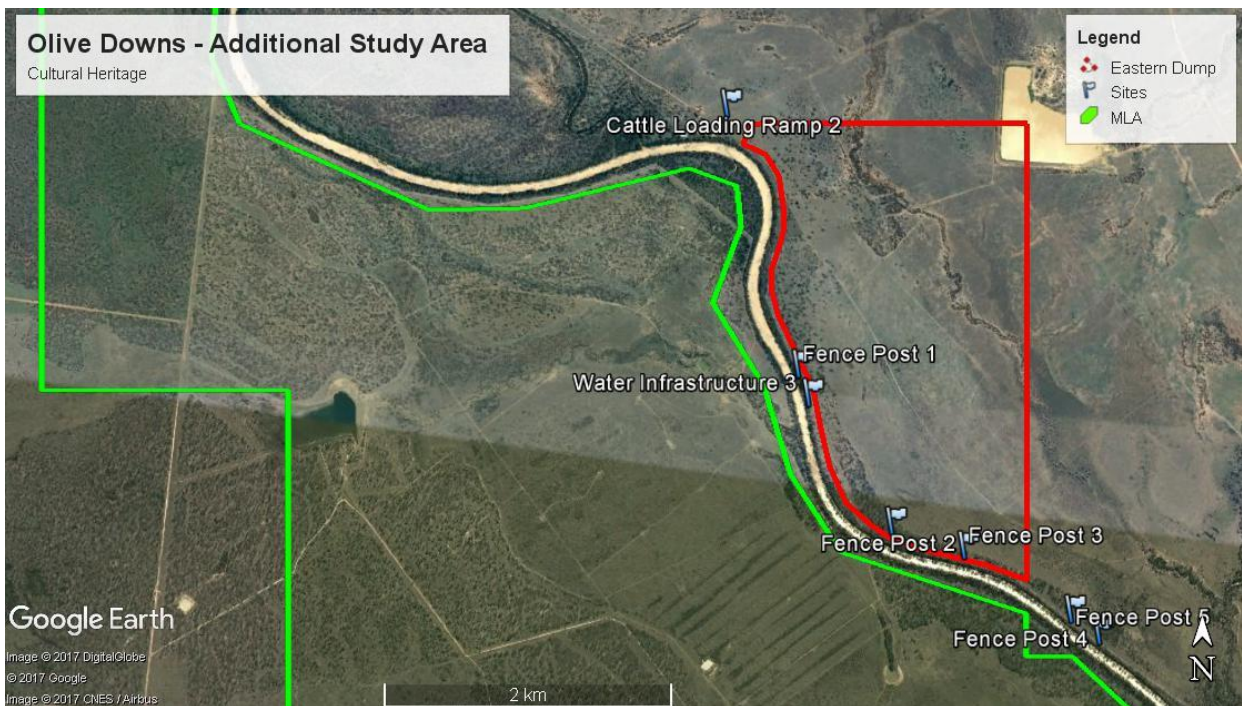



Figure 16: Location of sites in the Project area for second survey (Base image Google Earth Pro 2017).



### 3.3 Site Inventory

Tables 7 – 21 provide information about the fifteen potential NICH sites within the vicinity of the Project that have been identified as being of interest for this assessment. Significance assessments for these sites are provided in Section 4.

Table 7: Site 1 - Cattle Ramp.

Site Card – Site 1: Cattle Ramp	
Location	Olive Downs South Domain: 55 K 645520 7535225 (Figure 17) Within Project disturbance area
Description	Remains of a cattle ramp, comprising two substantial horizontal logs lying on the ground and lashed by barbed wire between two trees, immediately adjacent to an earthen ramp. The ramp measures c. 5m across, 8m long and 1m high. There are two metal star pickets about half way along the ramp. Two trees at the back of the ramp. Located in a flat area with box trees. Possibly originally dates to the 1940s, but given that it is a timber and earthen ramp, it may be earlier.
Condition	Reasonable. Location appears to still be in use, ramp itself possibly still in use.
Images	

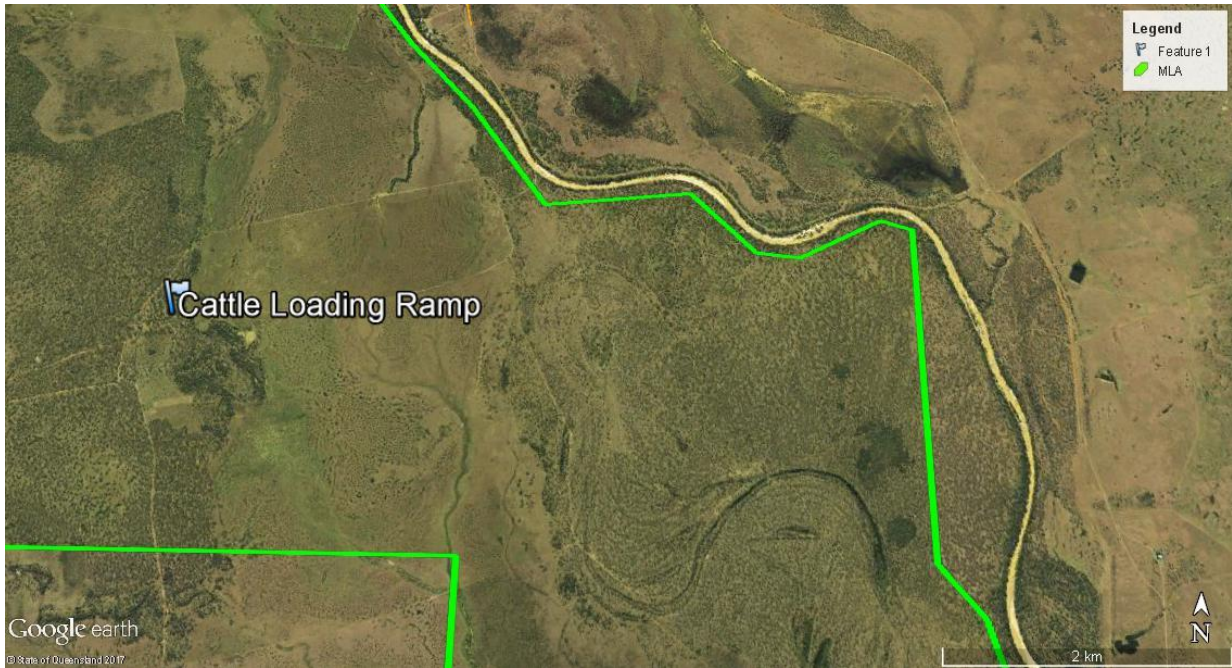


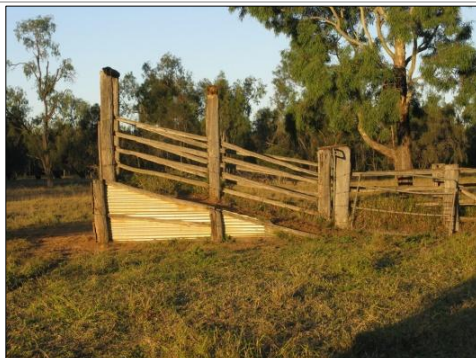
Figure 17: Location of Cattle Ramp in the Project area (base image Google Earth Pro 2017).

Table 8: Site 2 - Cattle Yards.

**Site Card – Site 2: Cattle Yards**

Location	Olive Downs South Domain: 55 K 646201 7540316 (Figure 18) Outside Project disturbance area
Description	<p>Extensive cattle yards with different fencing types (post and rail, metal rail, timber rails lashed with wire), pens and holding yards, metal and wire gates, a concrete drinking trough, loading ramps with uprights and horizontal rails, an earthen ramp and “Black River Cattle Equipment Co.” and “Breckon Clermont” branded metal plates for some of the holding pens. A central octagonal sorting yard to separate the cattle into different yards – this leads on to a ramp.</p> <p>The Black River Cattle Equipment Co. was established in the early 1960s at Black River, near Townsville, by Pat and Margaret Heferen from Moree, NSW. The company is a major manufacturer of portable cattle yards.</p> <p>Breckon Cattle Equipment is based in Clermont and has been designing, manufacturing and delivering cattle handling equipment since 1985. The company markets a range of manual, pneumatic and hydraulic equipment for use in bull depots, feedlots and live export depots.</p> <p>These cattle yards were therefore probably used over a long period of time, the most recent period dating to the 1960s and later.</p>
Condition	Mostly good. Still in use.

Images



Site Card – Site 2: Cattle Yards



Site Card – Site 2: Cattle Yards



Figure 18: Location of Cattle Yards in the Project area (base image Google Earth Pro 2017).

Table 9: Site 3 - Graves.

Site Card – Site 3: Graves	
Location	Olive Downs South Domain: 55 K 644130 7534850 (Figure 19) Within Project disturbance area
Description	Graves in an enclosure measuring c. 5m x 5m and 1m in height, with a metal fence. Plaque on a slab of igneous rock, with the following inscription (part only):  <p style="text-align: center;">“Audrey Frances Banks 1925-2001 Mary Frances Hile 1908-1998”</p> <p>There is nothing else around the grave to suggest why it was in this place. It is not near the river or a homestead as would be potentially indicated by old fences or exotic plantings.</p>
Condition	The tombstone itself is in excellent condition, but the fence has been damaged by cattle pushing against it. Thick reeds and grass cover surrounding the tombstone need to be removed.

Site Card – Site 3: Graves

Images





Figure 19: Location of the Grave in relation to Cattle Ramps (base image Google Earth Pro 2017).

Table 10: Site 4 - Water Infrastructure 1.

Site Card – Site 4: Water Infrastructure 1	
Location	Olive Downs South Domain: 55 K 646352 7538813 (Figure 20) Outside Project disturbance area
Description	In a flat grassed paddock next to the Isaac River, a series of examples of water infrastructure: Concrete-lined corrugated iron water trough system with wooden posts, c. 6 sets of posts, c. 1.4m wide and 15m long, the timber posts are c. 1m high and 10 centimetres (cm) in diameter; a large round concrete-lined corrugated iron water tank next to two modern PVC water tanks; pump shed of wooden posts with corrugated iron “walls” and concrete base with bolts still evident – c. 2.5m long and 2m high, to the south of and adjacent to the Isaac River.  Also, an old gate post c. 2.5m high, uprights 4m apart and c. 8-15cm in diameter, and an old fence post c. 1m high and 20cm in diameter, probably marks the old fence line from the pump and tank. Probably dates to the 1940s and later.
Condition	Evidence of repair to the corrugated iron water tank. Pump shed in poor condition. However, new tanks have been added, so this location is still in use.
Images	

Site Card – Site 4: Water Infrastructure 1



Site Card – Site 4: Water Infrastructure 1



Figure 20: Location of Water Infrastructure 1 in the Project area (base image Google Earth Pro 2017).

Table 11: Site 5 - Water Infrastructure 2.

Site Card – Site 5: Water Infrastructure 2

Location	Olive Downs South Domain: 55 K 643279 7545302 (Figure 21) Outside Project disturbance area
Description	In a flat grassed area, water infrastructure consisting of a metal water trough (not corrugated) with concrete lining, embossed on both ends “SOUTHERN CROSS”, and a corrugated iron water tank nearby. The trough is supported by wooden beams running along the sides and 5 timber upright posts. The posts are c. 1m high and c. 20cm in diameter. The water tank is not concrete lined (by contrast to Site 4), and has three corrugated iron sheets screwed together horizontally. The infrastructure probably dates to the 1950s and later. There is no evidence of a homestead nearby.  Southern Cross is an icon in the water supply and storage market in Australia, New Zealand and many international markets. Grown out of a company established in Toowoomba by Griffith Bros in 1871, the Southern Cross name was first introduced in 1903 with the establishment of one of the first metal windmills produced by the company. This launched “SOUTHERN CROSS” as one of the most recognisable names catering for the supply and



Site Card – Site 5: Water Infrastructure 2

storage of water for the agricultural, municipal, industrial, infrastructure, fire and mining industries.

Condition Poor. Not clear whether this infrastructure is still in use.

Images



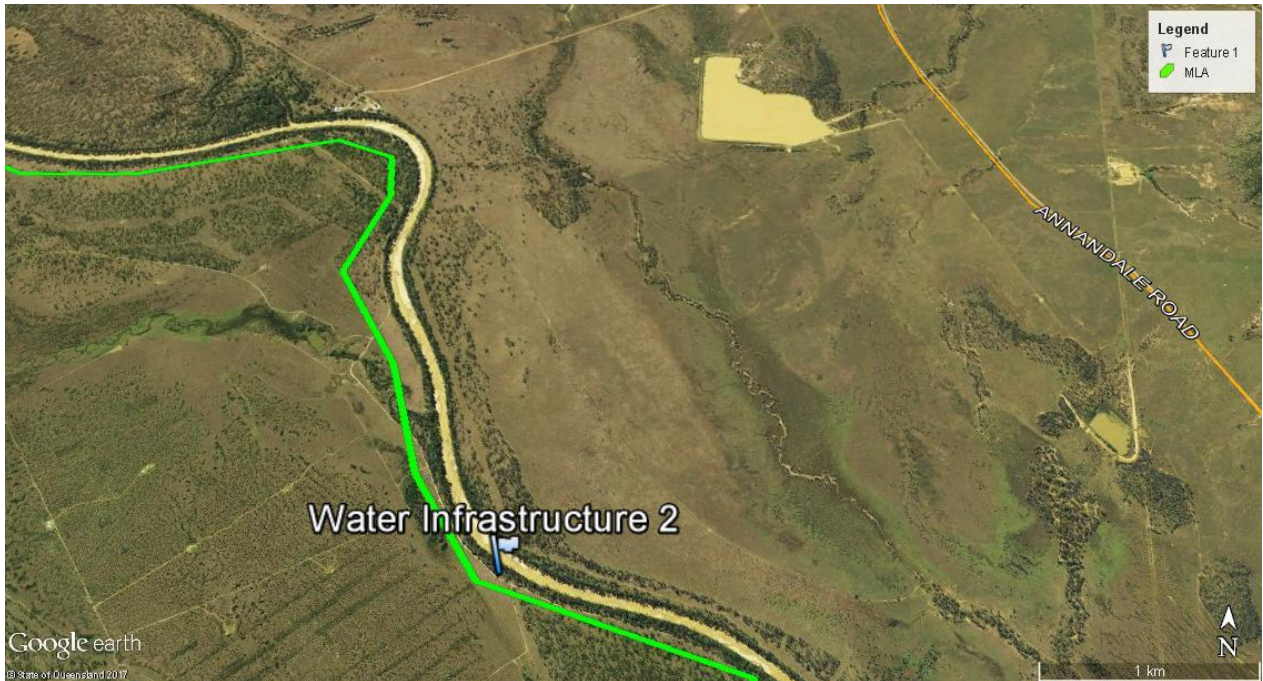


Figure 21: Location of Water Infrastructure 2 in the Project area (base image Google Earth Pro 2017).

Table 12: Site 6 - Steam Boilers.

Site Card – Site 6: Steam Boilers	
Location	Willunga Domain: 55 K 659780 7524719 (Figure 22) Within Project disturbance area
Description	Two large steam boilers in a field. Steel riveted machinery. Probably date to the early 1900s. It is unclear why they are located here and what they were used for.  There are metal and timber yards not far from the boilers, and these are still in use.
Condition	Good.
Images	

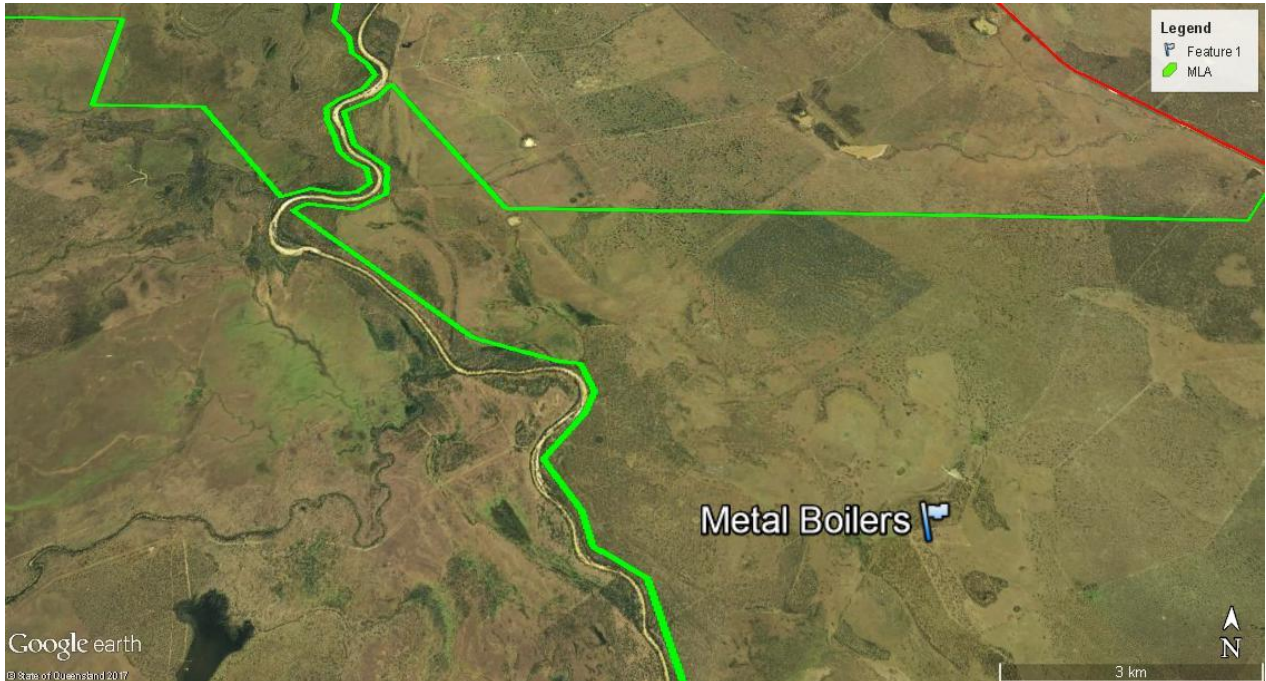



Figure 22: Location of Steam Boilers in the Project area (base image Google Earth Pro 2017).

Table 13: Site 7 - Water Infrastructure – Pump 1.

Site Card – Site 7: Water Infrastructure – Pump 1	
Location	Willunga Domain: 55 K 657949 7521841 (Figure 23) Outside Project disturbance area
Description	<p>Water pumps with a series of concrete bases. 44-gallon drum filled with concrete, windmill parts on it. One piece is embossed with:</p> <p style="text-align: center;">“SOUTHERN CROSS PFB 8 7 M 2”</p> <p>Southern Cross is an icon in the water supply and storage market in Australia, New Zealand and many international markets. Grown out of a company established in Toowoomba by Griffith Bros in 1871, the Southern Cross name was first introduced in 1903 with the establishment of one of the first metal windmills produced by the company. This launched “Southern Cross” as one of the most recognisable names catering for the supply and storage of water for the agricultural, municipal, industrial, infrastructure, fire and mining industries.</p> <p>Probably date to the 1950s and later, but were also potentially used over a long period of time.</p>
Condition	Reasonable. Still in use.
Images	

Site Card – Site 7: Water Infrastructure – Pump 1

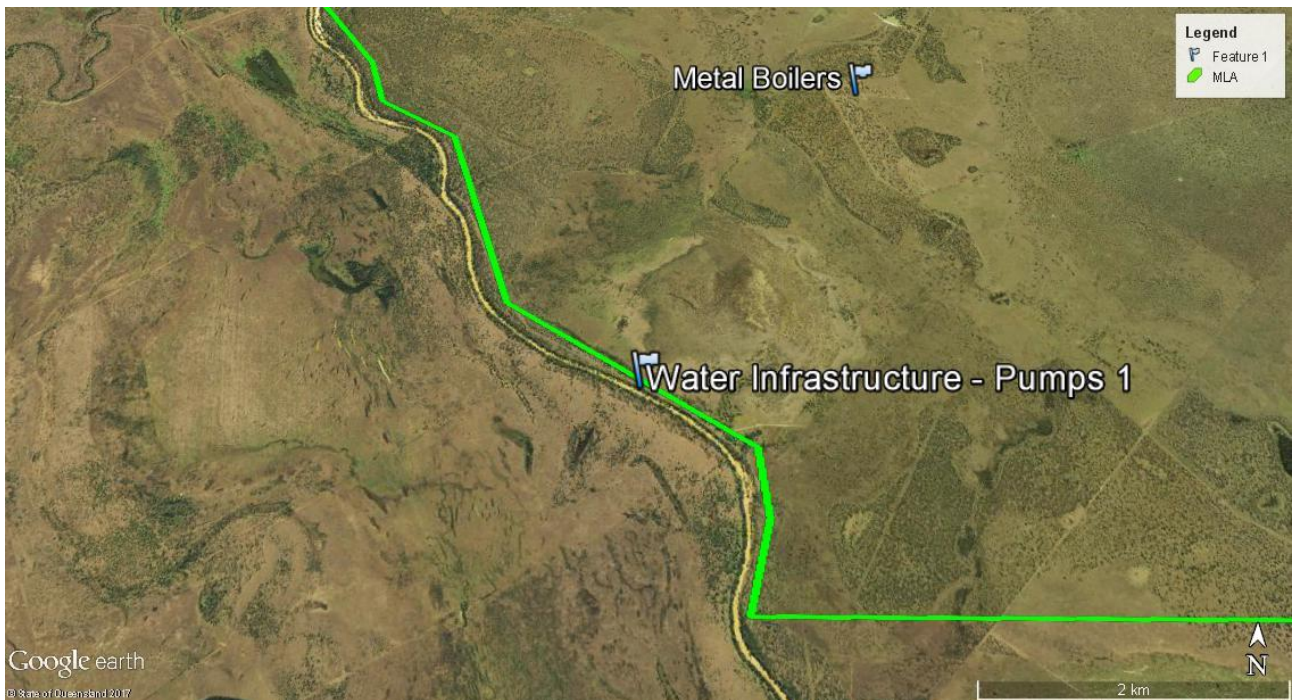


Figure 23: Location of Water Infrastructure Pump 1 in the Project area (base image Google Earth Pro 2017).

Table 14: Site 8 - Water Infrastructure – Pump 2.

Site Card – Site 8: Water Infrastructure – Pump 2	
Location	Willunga Domain: 55 K 659238 7519216 (Figure 24). Outside Project disturbance area
Description	Water pump in a grassed paddock in a small riparian corridor along the Isaac River, some regrowth. Metal windmill style pump on a concrete base. Probably dates to the 1960s and later, but was potentially used over a long period of time.
Condition	Good, and in better condition than Site 7. Still in use.
Images	




Figure 24: Location of Water Infrastructure Pump 2 in the Project area (base image Google Earth Pro 2017).

Table 15: Site 9 - Cattle Loading Ramp.

Site Card – Site 9: Cattle Loading Ramp 2	
Location	Olive Downs 55 K 642404 7548282. Outside Project disturbance area
Description	<p>Earthen cattle loading ramp, 25m long, comprising four massive horizontal wooden logs on the eastern side, some 1m in diameter, three large logs on the northern side, and four much smaller uprights on each site. The ramp is 2m high at the front. There is no timber on the western side of the ramp. Metal stairs are present on the north-eastern corner. Metal poles and galvanised iron sheeting occurs on the ground in front of the ramp.</p> <p>This ramp probably dates to the time of the improvements that were made to Olive Downs in the 1940s, but given that it is a timber and earthen ramp and the size of the logs used, it may be earlier.</p>
Condition	Reasonable. The logs are mostly in good condition, although the metal stairs are corroded.
Images	     

Table 16: Site 10 - Fence Post 1.

Site Card – Site 10: Fence Post 1	
Location	Olive Downs 55 K 642884 7546476 Outside Project disturbance area
Description	<p>Three square metal railway sleeper spikes on the scar of a Eucalypt tree. The natural scar is 2m high, 20cm wide at the top and 60cm wide at the bottom. Straight (not barbed) wire is lashed to the spikes. The distance from the bottom to the middle spike is 25 cm and it is 37cm from the middle to the top spike. The current fence line, which this forms a part of, is now made up of star pickets and some small wood hanging posts with three strands of barbed wire.</p> <p>As railway sleeper spikes are used in this fence, it postdates the establishment of the Northern (later Central) railway line to Clermont in 1884. It may relate to the fence line of an earlier property boundary. Factory-produced wire became widely available from the 1850s, and barbed wire began to appear in the early 1880s (Connah 1988). Drawing all this evidence together, it is possible that this fence post dates to the late 19<sup>th</sup>/early 20<sup>th</sup> century.</p>
Condition	Reasonable. There is some corrosion of the sleeper spikes and wire, and the scar on the tree appears to have been damaged by fire.
Images	

Site Card – Site 10: Fence Post 1



Table 17: Site 11 - Fence Post 2.

Site Card – Site 11: Fence Post 2

Location	Olive Downs 55 K 643524 7545382 Outside Project disturbance area	
Description	<p>Burnt out tree stump with three metal railway sleeper spikes for attaching fencing wire. The current fence line, which this forms a part of, is now made up of star pickets and some small wood hanging posts with three strands of barbed wire.</p> <p>As railway sleeper spikes are used in this fence, it postdates the establishment of the Northern (later Central) railway line to Clermont in 1884. It may relate to the fence line of an earlier property boundary. Factory-produced wire became widely available from the 1850s, and barbed wire began to appear in the early 1880s (Connah 1988). Drawing all this evidence together, it is possible that this fence post dates to the late 19<sup>th</sup>/early 20<sup>th</sup> century.</p>	
Condition	Poor. Very little remains of the tree, and the sleeper spike is corroded.	
Images	A photograph of a burnt tree stump. The wood is charred and blackened. A wire is wrapped around the top of the stump, and a metal spike is visible. The background shows some green grass and other vegetation.	A close-up photograph of a metal spike on a burnt stump. The spike is a cylindrical metal spike with a pointed end, and a wire is wrapped around it. The wood is charred and blackened.



Site Card – Site 11: Fence Post 2



Current Fence Line

Table 18: Site 12 – Fence Post 3.

Site Card – Site 12: Fence Post 3

Location	Olive Downs 55 K 644027 7545211 Outside Project disturbance area
Description	<p>Box tree with elongated scar on the western side towards the Isaac River, with four railway sleeper spikes within it. The scar is 105cm long and 20cm wide. The scar has been cut with metal tools for the placement of the spikes within it. The distances between spikes are as follows: 15cm bottom to second; 40cm second to third; 30cm third to top. The top three spikes have fence wire attached to them on one side, which is missing on the side nearest the “cockys gate”. The bottom spike is attached to the base of a “cockys gate” post. The topmost spike also has a chain which attaches to the “cockys gate” lever post. The current fence line, which this forms a part of, is now made up of star pickets and some small wood hanging posts with three strands of barbed wire.</p> <p>As railway sleeper spikes are used in this fence, it postdates the establishment of the Northern (later Central) railway line to Clermont in 1884. It may relate to the fence line of an earlier property boundary. Factory-produced wire became widely available from the 1850s, and barbed wire began to appear in the early 1880s (Connah 1988). Drawing all this evidence together, it is possible that this fence dates to the late 19<sup>th</sup>/early 20<sup>th</sup> century.</p>
Condition	Good. Some corrosion of the sleeper spikes and fence wire.

Site Card – Site 12: Fence Post 3

Images



Table 19: Site 13 – Fence Post 4.

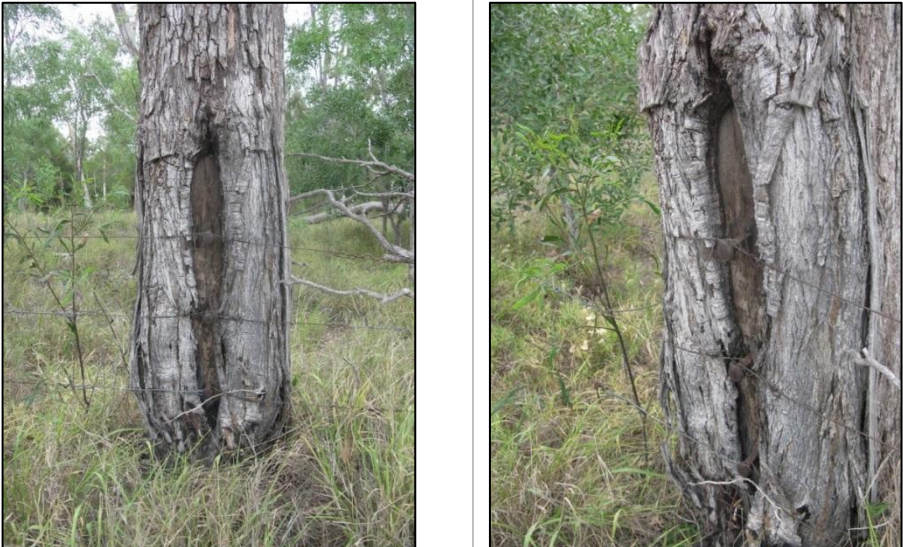
Site Card – Site 13: Fence Post 4	
Location	Olive Downs 55 K 644964 7544611 Outside Project disturbance area
Description	<p>Box tree with natural scar bearing three railway sleeper spikes. The scar is on the eastern side of the tree, and measures 115cm x 15cm. The distance from both the bottom to the middle spike and from the middle to the top spike is 35 cm. The current fence line to which this is a part, is now made up of star pickets and some small wood hanging posts with three strands of barbed wire.</p> <p>As railway sleeper spikes are used in this fence, it postdates the establishment of the Northern (later Central) railway line to Clermont in 1884. It may relate to the fence line of an earlier property boundary. Factory-produced wire became widely available from the 1850s, and barbed wire began to appear in the early 1880s (Connah 1988). Drawing all this evidence together, it is possible that this fence dates to the late 19<sup>th</sup>/early 20<sup>th</sup> century.</p>
Condition	Good, although there is quite a bit of overgrowth on the scar, particularly near the bottom.
Images	

Table 20: Site 14 – Water Infrastructure 3.

Site Card – Site 14: Water Infrastructure 3	
Location	Olive Downs 55 K 642954 7546275 Outside Project disturbance area
Description	<p>Water infrastructure consisting of a round galvanised iron tank, inflow pipes and a water trough. The galvanised rivetted iron tank has a metal base. There is no evidence of a concrete lining. There is an upright inflow pipe that runs towards the Isaac River. Adjacent and to the north of the tank is a concrete-lined metal water trough with inflow pipe and a float flow valve. Embossed on the valve attachment is “COMET” and “2 ½ H”. The water trough is 8m long and 78cm wide. The trough sits on a concrete base. There is a fence post on the north side, ½ way along the length of the trough.</p> <p>“COMET” may refer to Comet Windmills, a company that has manufactured a diverse range of rural products and has pumped water in the outback for over 130 years. Comet Windmills was founded by Sidney Williams (1851-1936) of Sidney Williams &amp; Company in 1879 in Rockhampton.</p> <p>There were also branch offices and stores in Brisbane and Townsville, and well over one hundred agents throughout Australia. “2½ H” would refer to the size of the water pump (in inches), as a range of sizes was available. Although the company dates to 1879, the infrastructure at this site probably dates to the same time as the improvements that were made to Olive Downs in the 1940s.</p>

Site Card – Site 14: Water Infrastructure 3

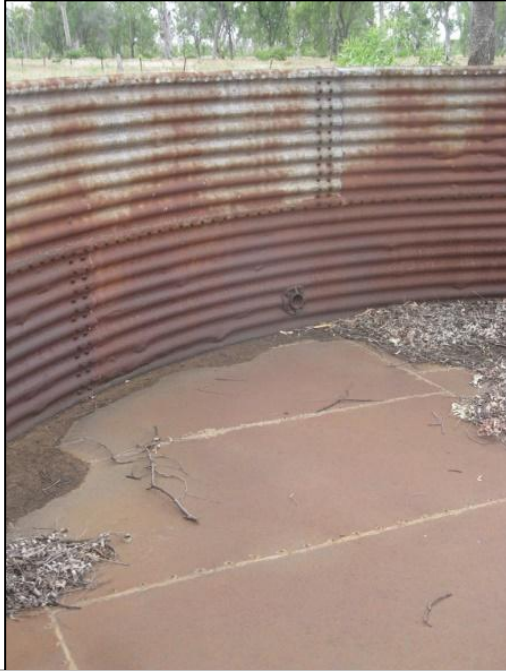
Condition

Reasonable. The galvanised iron water tank and the concrete base of the trough are corroded and broken. The water pipes are in good condition.

Images



Site Card – Site 14: Water Infrastructure 3



Images



Site Card – Site 14: Water Infrastructure 3

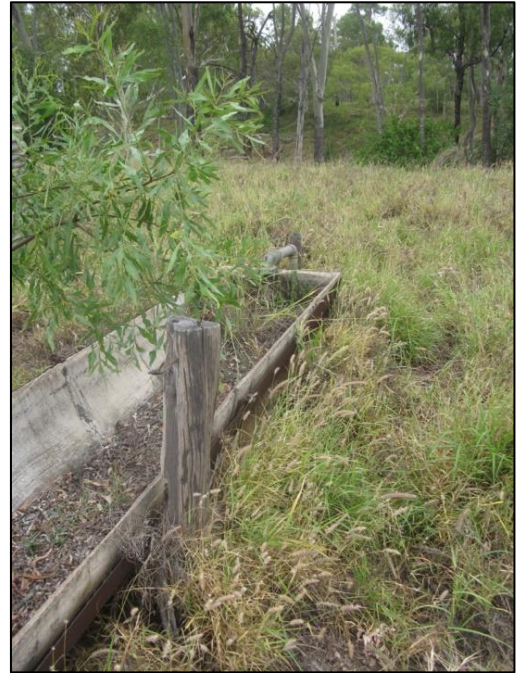


Table 21: Site 15 – Wire Tree.

Site Card – Site 15: Wire Tree

Location	Olive Downs 55 K 644768 7544762 Outside Project disturbance area
Description	<p>Old tree with wire within burls on its trunk, where the tree has grown around the wire of the fence line. Barbed wire has been added to the non-barbed (straight) wire within the tree. The distance from the bottom wire strand to the middle one is 35cm, and it is 25cm from the middle wire strand to the top one. The current fence line is made up of star pickets and some small wood hanging posts with three strands of barbed wire.</p> <p>Factory-produced wire became widely available from the 1850s, and barbed wire began to appear in the early 1880s (Connah 1988). Given that this site is on the same alignment as Fence Posts 1 - 4 (Sites 10 - 13), it may relate to the fence line of an earlier property boundary. Therefore, it is possible that this fence dates to the late 19<sup>th</sup>/early 20<sup>th</sup> century.</p>
Condition	Reasonable. The wire is in good condition, although there is some fire damage to the tree.

Site Card – Site 15: Wire Tree

Images



### **3.4 Landscape Heritage**

Collectively, the fifteen sites demonstrate the pastoral history of the landscape.

### **3.5 Further Potential for NICH in the Project Area**

Based on the results of the field work and the desktop assessment, there is the possibility that further sites may be identified in the Project area, however due to the relatively obtrusive nature of visible heritage evidence, it is unlikely that additional heritage items would be present in the Project area. Notwithstanding, recommendations have been made if previously unidentified heritage evidence is encountered during the life of the Project. The types of sites which may be within the Project area, but not identified in this assessment, include:

- Additional grave site/s.
- Evidence of former homestead site/s.
- Tanks, bores, dams.
- Stockyard and/or dip sites.
- Historic fence lines.
- Evidence of early mining.



## 4 Significance Assessment

This section assesses the NICH significance for individual sites and places within the vicinity of the Project, including an analysis of archaeological potential where applicable.

### 4.1 Significance Assessment

Cultural heritage significance relates to people’s perspective of place and sense of value within the context of history, environment, aesthetics and social organisation.

Within the vicinity of the Project, a total of fifteen sites of interest were assessed for potential heritage value. Three of these sites were within the Project disturbance area. These sites have been attributed an individual cultural heritage significance rating (Table 22). These sites are assessed against the significance assessment criteria outlined in Section 1.3.6, considering the contextual historical information available for the Project area, results of register searches and previous heritage studies.

Table 22: Significance Assessment for Individual Sites.

Site #	Site Name	Significance	Justification	Within Project disturbance area
1	Cattle Ramp	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	Yes
2	Cattle Yards	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
3	Graves	Some	As a grave, the site has some value, however it is not an historic grave. Refer to Section 6.3 for recommendations for the graves.	Yes
4	Water Infrastructure 1	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
5	Water Infrastructure 2	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
6	Steam Boilers	No significance	The boilers are historic elements and of interest, but their provenance is unclear. Further research may increase the identified significance to ‘some’ if they are determined to be connected directly to the history of the site (they may have been relocated there for an unknown reason).	Yes
7	Water Infrastructure - Pump 1	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
8	Water Infrastructure - Pump 2	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader	No

Site #	Site Name	Significance	Justification	Within Project disturbance area
			story of the pastoral history of the landscape.	
9	Cattle Ramp 2	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
10	Fence Post 1	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
11	Fence Post 2	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
12	Fence Post 3	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
13	Fence Post 4	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
14	Water Infrastructure 3	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No
15	Wire Tree	No significance	The element does not make a significant contribution to the heritage value of the place in its own right, although it is part of the broader story of the pastoral history of the landscape.	No

## 4.2 Results of Significance Assessment

Whilst the fifteen sites identified within the vicinity of the Project tell a collective story about the pastoral history of the landscape, they are common to the region and not considered to have sufficient value to be considered as landscape heritage. Likewise, individually, the sites do not have sufficient heritage value to consider inclusion on a local heritage register.

None of the identified sites or the landscape as a whole are considered to be of NICH significance.

The boilers (Site 6) are of some limited historical interest but as stated above, their provenance is unclear so likewise do not justify heritage listing.

The grave site (Site 3) is of some significance but it is not an historical grave. The Terms of Reference specifically requires that the graves be managed as part of the Project, therefore recommendations are provided in Section 6 accordingly.

## 5 Proposed Development

As described in Section 1.3, the Project comprises the Olive Downs South and Willunga domains and associated linear infrastructure corridors, including a rail spur connecting to the Norwich Park Branch Railway, a water pipeline connecting to the Eungella pipeline network, an ETL and access roads (Figure 2). The coal resource would be mined by conventional open cut mining methods, with product coal to be transported by rail to the Dalrymple Bay Coal Terminal. Up to 20 Mtpa of run-of-mine coal would be extracted over the anticipated Project operational life of approximately 66 years.

### 5.1 Project Impact on NICH

Fifteen sites were identified during both stages of the fieldwork within the vicinity of the Project. As stated in the significance assessment, none of the sites have been identified as having heritage value – therefore the Project will not have an impact on significant NICH. The only site that will require specific management is the modern graves.

As assessment of the likelihood of impact on all sites is provided in Table 23 below with general advice provided in Section 6.

Table 23: Project impact.

Site #	Site Name	Potential Impact
1	Cattle Ramp	Located within disturbance area.
2	Cattle Yards	No impact – outside of proposed works areas.
3	Graves	Located within disturbance area.
4	Water Infrastructure 1	No impact – outside of proposed works area.
5	Water Infrastructure 2	No impact – outside of proposed works area.
6	Steam Boilers	Located within disturbance area.
7	Water Infrastructure - Pump 1	No impact – outside of proposed works area.
8	Water Infrastructure - Pump 2	No impact – outside of proposed works area.
9	Cattle Ramp 2	No impact – outside of proposed works area.
10	Fence Post 1	No impact – outside of proposed works area.
11	Fence Post 2	No impact – outside of proposed works area.
12	Fence Post 3	No impact – outside of proposed works area.
13	Fence Post 4	No impact – outside of proposed works area.
14	Water Infrastructure 3	No impact – outside of proposed works area.
15	Wire Tree	No impact – outside of proposed works area.

### 5.2 Project Impact on Potential NICH

It is concluded that there is low potential for further historic and archaeological places/items to exist within the Project area. Recommendations and mitigation measures to manage Project impact on unexpected finds are provided in Section 6 and Appendix B.

## 6 Recommendations

As stated in Section 5.1, it is assumed that Sites 1, 3 and 6 are expected to be removed by the development of the Project as these sites are located within the disturbance area. The other sites are not anticipated to be impacted as they would be retained *in-situ*, however, should avoidance not be possible their removal would not constitute an adverse heritage impact.

Furthermore, while the probability is low, it should be noted that potential sites of NICH significance may be extant within the Project area – these could be subsurface (i.e. archaeological sites) or other currently unidentified sites (e.g. related to mining activities).

This section provides site specific recommendations in relation to the identified NICH sites, as well as general recommendations to manage potential impacts on unknown/unexpected NICH sites that may be extant within the Project area and may be encountered during Project activities. Assuming the management measures below are suitably implemented, this assessment concludes that the nature and level of impact on NICH by the Project is manageable.

### 6.1 Recommendation One - Avoidance of Sites

The best form of cultural heritage management is to avoid impact on sites and places of significance. It is recommended that the design of the Project area consider each of the NICH sites discussed in this report, and, where possible, avoid impacting on these sites, or if this is not possible, implement the relevant mitigation measures as recommended herein.

### 6.2 Recommendation Two - Recording of Impacted Sites

Heritage recording, compliant with the Draft EPA Guidelines for Archival Recording (including historical research, consultation, photography, site plans and related drawings where relevant), should be undertaken for NICH sites directly impacted by the development. Depending on the nature of the site (i.e. level of significance. This is especially recommended for Site 3 (Grave) at a minimum.

### 6.3 Recommendation Three – Management of the Grave

As this site is located within the disturbance area, the most practical solution is to consult with the family members and have the grave relocated to a nearby cemetery or location of their choosing. To identify relatives, a title search should be undertaken to determine who owned the property at the time of the burials. Any relocation activity should be undertaken in accordance with relevant permits and approvals.

### 6.4 Recommendation Four - NICH Management across the Project Area

The NICH management recommendations outlined in this report should be implemented and incorporated into the Project's environmental management system to mitigate impacts on both identified NICH sites and any unidentified NICH material/sites found during the development of the Project. These recommendations should be applied across the entire project area and should provide information and processes to enable identification and protection of NICH sites, both known and unknown.

The policies and procedures for management of NICH sites or archaeological material uncovered during the Project, as outlined in Appendix B (Incidental Finds Procedure), should be implemented. Additionally, it is recommended that diligence be practiced during works conducted within the Project area, particularly during any clearing or construction phases associated with initial preparation of the area. To facilitate this diligence, it is recommended that a NICH Induction Booklet be developed once all approvals for the Project are in place but prior to ground disturbing activities, which can be incorporated into the General Site Induction.

The NICH Induction Booklet should be prepared by a qualified heritage specialist and include the following:

- Specific instruction for crews regarding their obligations to look for and avoid impacting on NICH material until it has been properly assessed.
- Presentation of familiarisation material for work crews so that they are aware of what constitutes a NICH find.
- Information about the NICH sites that were identified during the survey.
- Provision of educational material to personnel informing them what archaeological material may look like, and providing clear instructions on what to do should any such material be found (as per Appendix B).
- A process for the collection, transport and storage of any NICH items.

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**Queensland State Archive Files**

- QSA Item ID 437838
- QSA Item ID 1110488



## Appendices

## 6.5 Appendix A – Mapping

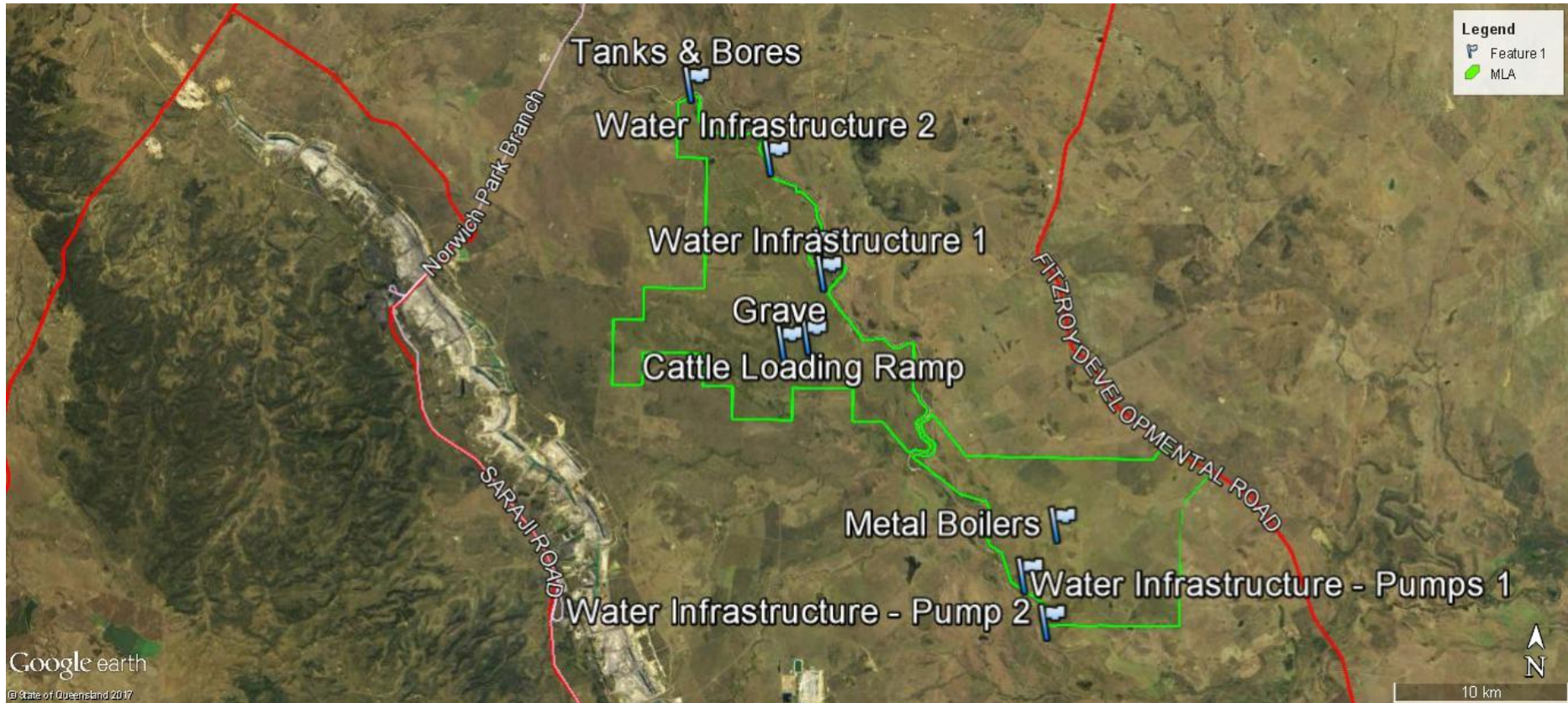


Figure 25: Location of Sites for Stage 1 (base image Google Earth Pro 2017).

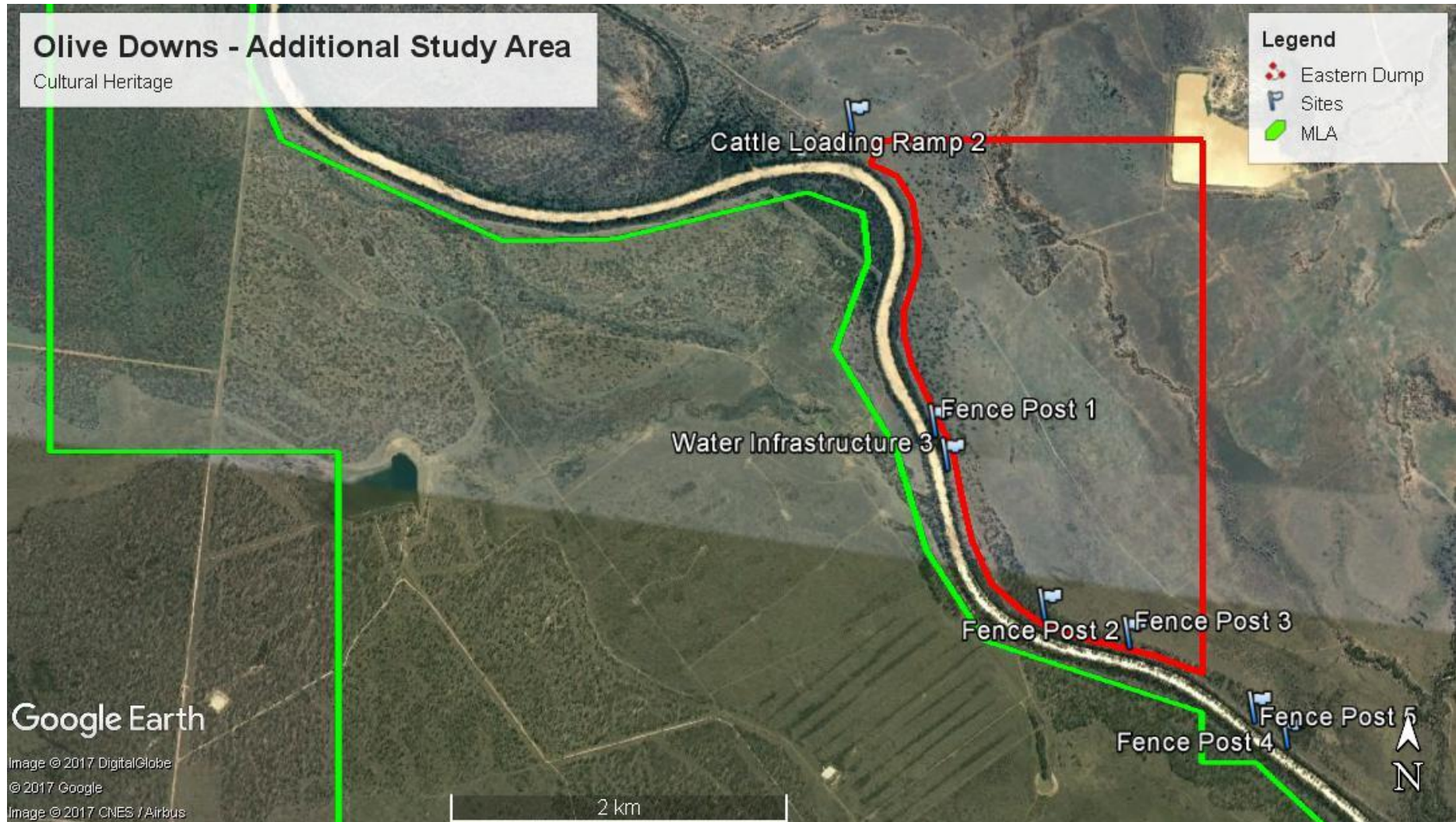


Figure 26: Location of Sites for Stage 2 (base image Google Earth Pro 2017).

## 6.6 Appendix B – Incidental Finds Procedure

